APPENDIX R
ECOLOGICAL RISK ASSESSMENT DATA

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Appendix Table R-1. Soil Ecological Screening Values For Load Line 4 at Ravenna, Ohio

Analyte	CAS Registry Number	Soil Screening Values											
		Efroymson et al. (1997a) Preliminary Remediation Goals for Ecological Endpoints[a]		Screening Value for Earthworms and Soil Microorganisms (Efroymson et al. 1997b)[b]				Soil Screening values for Plants (Efroymson et al. 1997c)[c]		Ecological Data Quality Levels (EDQL)[d]		Preferred Ecological Screening Value (ESV)[e]	
		Number (mg/kg)	Source	Benchmarks for Earthworm Number (mg/kg)	Source	Benchmarks for soil microorganism Number (mg/kg)	Source	Number mg/kg mg/L	Source (Soil) (Solution)	Number (mg/kg)	Source	Number (mg/kg)	Source
Metals (Target Analyte List)													
Aluminum	7429-90-5	--		--		600	LOEC	50	Soil, LOEC	--		6.00E+02	LOEC
Antimony	7440-36-0	5	PRGs	--		--		5	Soil, LOEC	0.1423	EDQL EPA Region 5 (1998)	5.00E+00	PRGs
Arsenic	7440-38-2	9.9	PRGs	60	LOEC	100	LOEC	10	Soil, NOEC	5.7	EDQL EPA Region 5 (1998)	9.90E+00	PRGs
Barium	7440-39-3	283	PRGs	--		3000	LOEC	500	Soil, LOEC	1.04	EDQL EPA Region 5 (1998)	2.83E+02	PRGs
Beryllium		10	PRGs									1.00E+01	PRGs
Bismuth	7440-69-9	--		--		--		20	No Soil, only Solution, LOEC	--		2.00E+01	No Soil, only Solution, LOEC
Boron	7440-42-8	0.5	PRGs	--		20	LOEC	0.5	Soil, LOEC	--		5.00E-01	PRGs
Bromine	7726-95-6	10	PRGs	--		--		10	Soil, LOEC	--		1.00E+01	PRGs
Cadmium	7440-43-9	4	PRGs	20	LOEC	20	LOEC	4	Soil, LOEC	0.00222	EDQL EPA Region 5 (1998)	4.00E+00	PRGs
Calcium	7440-70-2	--		--		--		--		--		No ESV	No Source
Chromium	16065-83-1	0.4	PRGs	0.4	LOEC	10	NOEC	1	Soil, LOEC	0.4	EDQL EPA Region 5 (1998)	4.00E-01	PRGs
Cobalt	7440-48-4	20	PRGs	--		1000	LOEC	20	Soil, LOEC	0.14033	EDQL EPA Region 5 (1998)	2.00E+01	PRGs
Copper	7440-50-8	60	PRGs	60	LOEC	100	LOEC	100	Soil ,NOEC	0.3132	EDQL EPA Region 5 (1998)	1.39E+01	PPL (SAIC 2002)
Cyanide	57-12-5	--		--		--		--		1.33	EDQL EPA Region 5 (1998)	1.08E+00	PPL (SAIC 2002)
Fluorine	7782-41-4	200	PRGs	--		30	LOEC	200	Soil, LOEC	--		2.00E+02	PRGs
Iodine	7553-56-2	4	PRGs	--		--		4	Soil, LOEC	--		4.00E+00	PRGs
Iron	7439-89-6	--		--		200	NOEC	10	No Soil, only Solution, LOEC	--		2.00E+02	NOEC
Lanthanum	7439-91-0	--		--		50	LOEC	--		--		5.00E+01	LOEC
Lead	7439-92-1	40.5	PRGs	500	NOEC	900	NOEC	50	Soil ,NOEC	0.05373	EDQL EPA Region 5 (1998)	4.05E+01	PRGs
Lithium	7439-93-2	2	PRGs	--		10	LOEC	2	Soil, LOEC	--		2.00E+00	PRGs
Magnesium	7439-95-4	--		--		--		--		--		No ESV	No Source
Manganese	7439-96-5	--		--		100	LOEC	500	Soil, LOEC	--		1.00E+02	LOEC
Mercury	7439-97-6	0.00051	PRGs	0.1	LOEC	30	NOEC	0.3	Soil, LOEC	0.1	EDQL EPA Region 5 (1998)	5.10E-04	PRGs
Molybdenum	7439-98-7	2	PRGs	--		200	LOEC	2	Soil, LOEC	--		2.00E+00	PRGs
Nickel	7440-02-0	30	PRGs	200	NOEC	90	LOEC	30	Soil ,NOEC	13.6	EDQL EPA Region 5 (1998)	3.00E+01	PRGs
Potassium	7440-09-7	--		--		--		--		--		No ESV	No Source
Selenium	7782-49-2	0.21	PRGs	70	LOEC	100	LOEC	1	Soil, LOEC	0.02765	EDQL EPA Region 5 (1998)	2.10E-01	PRGs
Silver	7440-22-4	2	PRGs	--		50	NOEC	2	Soil, LOEC	4.04	EDQL EPA Region 5 (1998)	2.00E+00	PRGs
Sodium	7440-23-5	--		--		--		--		--		No ESV	No Source
Sulfide	18496-25-8	--		--		--		--		0.00358	EDQL EPA Region 5 (1998)	3.58E-03	EDQL EPA Region 5 (1998)
Technetium	7440-26-8	0.2	PRGs	--		--		0.2	Soil ,NOEC	--		2.00E-01	PRGs
Tellurium	13494-80-9	--		--		--		2	No Soil, only Solution, LOEC	--		2.00E+00	No Soil, only Solution, LOEC
Thallium	7440-28-0	1	PRGs	--		--		1	Soil, LOEC	0.05692	EDQL EPA Region 5 (1998)	1.00E+00	PRGs
Tin	7440-31-5	50	PRGs	--		2000	LOEC	50	Soil, LOEC	7.62	EDQL EPA Region 5 (1998)	5.00E+01	PRGs
Titanium	7440-32-6	--		--		1000	LOEC	0.06	No Soil, only Solution, LOEC	--		1.00E+03	LOEC
Tungsten	7440-33-7	--		--		400	NOEC	--		--		4.00E+02	NOEC
Uranium	7440-61-1	5	PRGs	--		--		5	Soil, NOEC	--		5.00E+00	PRGs
Vanadium	7440-62-2	2	PRGs	--		20	LOEC	2	Soil, LOEC	1.59	EDQL EPA Region 5 (1998)	2.00E+00	PRGs
Zinc	7440-66-6	8.5	PRGs	200	LOEC	100	NOEC	50	Soil, NOEC	6.62	EDQL EPA Region 5 (1998)	8.50E+00	PRGs

Appendix Table R-1. Soil Ecological Screening Values For Load Line 4 at Ravenna, Ohio

Analyte	CAS Registry Number	Soil Screening Values											
		Efroymson et al. (1997a) Preliminary Remediation Goals for Ecological Endpoints[a]		Screening Value for Earthworms and Soil Microorganisms (Efroymson et al. 1997b)[b]				Soil Screening values for Plants (Efroymson et al. 1997c)[c]		Ecological Data Quality Levels (EDQL)[d]		Preferred Ecological Screening Value (ESV)[e]	
		Number (mg/kg)	Source	Benchmarks for Earthworm Number (mg/kg)	Source	Benchmarks for soil microorganism Number (mg/kg)	Source	Number mg/kg mg/L	Source (Soil) (Solution)	Number (mg/kg)	Source	Number (mg/kg)	Source
Organic Compounds		--		--		--		--		--		No ESV	No Source
Acenaphthene	83-32-9	20	PRGs	--		--		20	Soil, LOEC	--		2.00E+01	PRGs
Acenaphthylene	208-96-8	--		--		--		--		--		No ESV	No Source
Acetone	67-64-1	--		--		--		--		--		No ESV	No Source
Acrylonitrile	107-13-1	--		--		1000	LOEC	--		--		1.00E+03	LOEC
Aldrin	309-00-2	--		--		--		--		--		No ESV	No Source
4-Aminobiphenyl	92-67-1	--		--		--		--		0.00305	EDQL EPA Region 5 (1998)	3.05E-03	EDQL EPA Region 5 (1998)
Aniline	62-53-3	--		--		--		200	No Soil, only Solution, LOEC	0.05678	EDQL EPA Region 5 (1998)	2.00E+02	No Soil, only Solution, LOEC
Anthracene	120-12-7	--		--		--		--		1480	EDQL EPA Region 5 (1998)	1.48E+03	EDQL EPA Region 5 (1998)
PCB-1016	12674-11-2	--		--		--		--		--		No ESV	No Source
Arochlor-1221	11104-28-2	--		--		--		--		--		No ESV	No Source
Arochlor-1232	11141-16-5	--		--		--		--		--		No ESV	No Source
Arochlor-1242	53469-21-9	--		--		--		--		--		No ESV	No Source
Arochlor-1248	12672-29-6	--		--		--		--		--		No ESV	No Source
PCB-1254	11097-69-1	--		--		--		--		--		No ESV	No Source
Arochlor-1260	11096-82-5	--		--		--		--		--		No ESV	No Source
Benzene	71-43-2	--		--		--		--		0.25462	EDQL EPA Region 5 (1998)	2.55E-01	EDQL EPA Region 5 (1998)
Benzo(a)anthracene	56-55-3	--		--		--		--		5.21	EDQL EPA Region 5 (1998)	5.21E+00	EDQL EPA Region 5 (1998)
Benzo(a)pyrene	50-32-8	--		--		--		--		1.52	EDQL EPA Region 5 (1998)	1.52E+00	EDQL EPA Region 5 (1998)
Benzo(b)fluoranthene	205-99-2	--		--		--		--		59.8	EDQL EPA Region 5 (1998)	5.98E+01	EDQL EPA Region 5 (1998)
Benzo(g,h,i)perylene	191-24-2	--		--		--		--		119	EDQL EPA Region 5 (1998)	1.19E+02	EDQL EPA Region 5 (1998)
Benzo(k)fluoranthene	207-08-9	--		--		--		--		148	EDQL EPA Region 5 (1998)	1.48E+02	EDQL EPA Region 5 (1998)
BHC	608-73-1	--		--		--		--		--		No ESV	No Source
BHC, alpha	319-84-6	--		--		--		--		0.09939	EDQL EPA Region 5 (1998)	9.94E-02	EDQL EPA Region 5 (1998)
beta-BHC	319-85-7	--		--		--		--		0.00398	EDQL EPA Region 5 (1998)	3.98E-03	EDQL EPA Region 5 (1998)
BHC, delta	319-86-8	--		--		--		--		9.94	EDQL EPA Region 5 (1998)	9.94E+00	EDQL EPA Region 5 (1998)
BHC, gamma	58-89-9	--		--		--		--		0.005	EDQL EPA Region 5 (1998)	5.00E-03	EDQL EPA Region 5 (1998)
Biphenyl	92-52-4	60	PRGs	--		--		60	Soil, LOEC	--		6.00E+01	PRGs
bis(2-chloroethoxy) methane	111-91-1	--		--		--		--		0.30209	EDQL EPA Region 5 (1998)	3.02E-01	EDQL EPA Region 5 (1998)
bis(2-Chloroethyl) ether	111-44-4	--		--		--		--		23.7	EDQL EPA Region 5 (1998)	2.37E+01	EDQL EPA Region 5 (1998)
bis(2-Ethylhexyl)phthalate	117-81-7	--		--		--		--		0.92594	EDQL EPA Region 5 (1998)	9.26E-01	EDQL EPA Region 5 (1998)
4-Bromoaniline	106-40-1	--		--		--		100	No Soil, only Solution, LOEC	--		1.00E+02	No Soil, only Solution, LOEC
Bromodichloromethane	75-27-4	--		--		--		--		0.53978	EDQL EPA Region 5 (1998)	5.40E-01	EDQL EPA Region 5 (1998)
Bromoform	75-25-2	--		--		--		--		15.9	EDQL EPA Region 5 (1998)	1.59E+01	EDQL EPA Region 5 (1998)
Bromomethane	74-83-9	--		--		--		--		--		No ESV	No Source
4-bromophenyl-phenylether	101-55-3	--		--		--		--		--		No ESV	No Source
2-Butanone	78-93-3	--		--		--		--		89.6	EDQL EPA Region 5 (1998)	8.96E+01	EDQL EPA Region 5 (1998)
Butylbenzyl phthalate	85-68-7	--		--		--		--		--		No ESV	No Source
N-Nitrosodi-n-Butylamine	924-16-3	--		--		--		--		0.26707	EDQL EPA Region 5 (1998)	2.67E-01	EDQL EPA Region 5 (1998)
Carbazole	86-74-8	--		--		--		--		--		No ESV	No Source
Carbon disulfide	75-15-0	--		--		--		--		0.09412	EDQL EPA Region 5 (1998)	9.41E-02	EDQL EPA Region 5 (1998)

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		Efroymson et al. (1997a) Preliminary Remediation Goals for Ecological Endpoints[a]		Screening Value for Earthworms and Soil Microorganisms (Efroymson et al. 1997b)[b]				Soil Screening values for Plants (Efroymson et al. 1997c)[c]		Ecological Data Quality Levels (EDQL)[d]		Preferred Ecological Screening Value (ESV)[e]	
		Number (mg/kg)	Source	Benchmarks for Earthworm Number (mg/kg)	Source	Benchmarks for soil microorganism Number (mg/kg)	Source	Number mg/kg mg/L	Source (Soil) (Solution)	Number (mg/kg)	Source	Number (mg/kg)	Source
Carbon tetrachloride	56-23-5	--		--		1000	LOEC	--		2.98	EDQL EPA Region 5 (1998)	1.00E+03	LOEC
Chloroacetamide	79-07-2	2	PRGs	2	LOEC	--		--		--		2.00E+00	PRGs
p-chloroaniline	106-47-8	--		--		--		--		1.1	EDQL EPA Region 5 (1998)	1.10E+00	EDQL EPA Region 5 (1998)
3-Chloroaniline	108-42-9	20	PRGs	30	LOEC	--		20	Soil, LOEC	--		2.00E+01	PRGs
4-Chloroaniline	106-47-8	--		--		--		40	No Soil, only Solution, LOEC	--		4.00E+01	No Soil, only Solution, LOEC
Chlorobenzene	108-90-7	40	PRGs	40	LOEC	--		--		13.1	EDQL EPA Region 5 (1998)	4.00E+01	PRGs
Chlorobenzilate	510-15-6	--		--		--		--		5.05	EDQL EPA Region 5 (1998)	5.05E+00	EDQL EPA Region 5 (1998)
Chlordane	12789-03-6	--		--		--		--		0.224	EDQL EPA Region 5 (1998)	2.24E-01	EDQL EPA Region 5 (1998)
alpha-Chlordane	12789-03-6	--		--		--		--		0.224	EDQL EPA Region 5 (1998)	2.24E-01	EDQL EPA Region 5 (1998)
gamma-Chlordane	12789-03-6	--		--		--		--		0.224	EDQL EPA Region 5 (1998)	2.24E-01	EDQL EPA Region 5 (1998)
Chloroethane	75-00-3	--		--		--		--		--		No ESV	No Source
Chloroform	67-66-3	--		--		--		--		1.19	EDQL EPA Region 5 (1998)	1.19E+00	EDQL EPA Region 5 (1998)
Chloromethane	74-87-3	--		--		--		--		--		No ESV	No Source
2-Chloronaphthalene	91-58-7	--		--		--		--		0.01218	EDQL EPA Region 5 (1998)	1.22E-02	EDQL EPA Region 5 (1998)
2-Chlorophenol	95-57-8	--		--		--		60	No Soil, only Solution, LOEC	0.24266	EDQL EPA Region 5 (1998)	6.00E+01	No Soil, only Solution, LOEC
3-Chlorophenol	108-43-0	7	PRGs	10	LOEC	--		7	Soil, LOEC	--		7.00E+00	PRGs
4-Chlorophenol	106-48-9	--		--		--		50	No Soil, only Solution, LOEC	--		5.00E+01	No Soil, only Solution, LOEC
4-Chlorophenyl-phenyl ether	7005-72-3	--		--		--		--		--		No ESV	No Source
4-chloro-3-methylphenol	59-50-7	--		--		--		--		--		No ESV	No Source
Chloropropene	107-05-1	--		--		--		--		0.0029	EDQL EPA Region 5 (1998)	2.90E-03	EDQL EPA Region 5 (1998)
Chrysene	218-01-9	--		--		--		--		4.73	EDQL EPA Region 5 (1998)	4.73E+00	EDQL EPA Region 5 (1998)
4,6-dinitro-o-Cresol	534-52-1	--		--		--		--		0.14408	EDQL EPA Region 5 (1998)	1.44E-01	EDQL EPA Region 5 (1998)
m-Cresol	108-39-4	--		--		--		--		3.49	EDQL EPA Region 5 (1998)	3.49E+00	EDQL EPA Region 5 (1998)
o-Cresol	95-48-7	--		--		--		--		40.4	EDQL EPA Region 5 (1998)	4.04E+01	EDQL EPA Region 5 (1998)
2-Cresol	95-48-7	--		--		--		50	No Soil, only Solution, LOEC	--		5.00E+01	No Soil, only Solution, LOEC
p-chloro-m-Cresol	59-50-7	--		--		--		--		7.95	EDQL EPA Region 5 (1998)	7.95E+00	EDQL EPA Region 5 (1998)
p-Cresol	106-44-5	--		--		--		--		163	EDQL EPA Region 5 (1998)	1.63E+02	EDQL EPA Region 5 (1998)
Diallate	2303-16-4	--		--		--		--		0.45214	EDQL EPA Region 5 (1998)	4.52E-01	EDQL EPA Region 5 (1998)
2,4-D	94-75-7	--		--		--		--		0.02725	EDQL EPA Region 5 (1998)	2.73E-02	EDQL EPA Region 5 (1998)
4,4'-DDD	72-54-8	--		--		--		--		0.75815	EDQL EPA Region 5 (1998)	7.58E-01	EDQL EPA Region 5 (1998)
4,4'-DDE	72-55-9	--		--		--		--		0.59587	EDQL EPA Region 5 (1998)	5.96E-01	EDQL EPA Region 5 (1998)
4,4'-DDT	50-29-3	--		--		--		--		0.0175	EDQL EPA Region 5 (1998)	1.75E-02	EDQL EPA Region 5 (1998)
Diazinon	333-41-5	--		--		--		--		--		No ESV	No Source
Dibenzo(a,h)anthracene	53-70-3	--		--		--		--		18.4	EDQL EPA Region 5 (1998)	1.84E+01	EDQL EPA Region 5 (1998)
Dibenzofuran	132-64-9	--		--		--		--		--		No ESV	No Source
1,2-Dibromo-3-Chloropropane	96-12-8	--		--		--		--		0.03518	EDQL EPA Region 5 (1998)	3.52E-02	EDQL EPA Region 5 (1998)
Dibromochloromethane	124-48-1	--		--		--		--		2.05	EDQL EPA Region 5 (1998)	2.05E+00	EDQL EPA Region 5 (1998)
Dibromoethane	106-93-4	--		--		--		--		1.23	EDQL EPA Region 5 (1998)	1.23E+00	EDQL EPA Region 5 (1998)
2,4-Dichloroaniline	554-00-7	100	PRGs	100	NOEC	--		--		--		1.00E+02	PRGs
3,4-Dichloroaniline	95-76-1	20	PRGs	20	LOEC	--		10	No Soil, only Solution, LOEC	--		2.00E+01	PRGs
o-Dichlorobenzene	95-50-1	--		--		--		--		2.96	EDQL EPA Region 5 (1998)	2.96E+00	EDQL EPA Region 5 (1998)

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		Efroymson et al. (1997a) Preliminary Remediation Goals for Ecological Endpoints[a]		Screening Value for Earthworms and Soil Microorganisms (Efroymson et al. 1997b)[b]				Soil Screening values for Plants (Efroymson et al. 1997c)[c]		Ecological Data Quality Levels (EDQL)[d]		Preferred Ecological Screening Value (ESV)[e]	
				Benchmarks for Earthworm		Benchmarks for soil microorganism							
		Number (mg/kg)	Source	Number (mg/kg)	Source	Number (mg/kg)	Source	Number mg/kg mg/L	Source (Soil) (Solution)	Number (mg/kg)	Source	Number (mg/kg)	Source
p-Dichlorobenzene	106-46-7	--		--		--		--		0.54559	EDQL EPA Region 5 (1998)	5.46E-01	EDQL EPA Region 5 (1998)
1,2-Dichlorobenzene	95-50-1	--		--		--		--		--		No ESV	No Source
1,3-Dichlorobenzene	541-73-1	--		--		--		--		--		No ESV	No Source
1,4-Dichlorobenzene	106-46-7	20	PRGs	20	LOEC	--		--		--		2.00E+01	PRGs
3,3'-Dichlorobenzidine	91-94-1	--		--		--		--		0.64636	EDQL EPA Region 5 (1998)	6.46E-01	EDQL EPA Region 5 (1998)
Cis-1,4-dichloro-2-butene	1476-11-5	--		--		1000	LOEC	--		--		1.00E+03	LOEC
Trans-1,4-dichloro-2-butene	110-57-6	--		--		1000	LOEC	--		--		1.00E+03	LOEC
1,1-Dichloroethane	75-34-3	--		--		--		--		20.1	EDQL EPA Region 5 (1998)	2.01E+01	EDQL EPA Region 5 (1998)
1,2-Dichloroethane	107-06-2	--		--		--		--		21.2	EDQL EPA Region 5 (1998)	2.12E+01	EDQL EPA Region 5 (1998)
1,1-Dichloroethene	75-35-4	--		--		--		--		8.28	EDQL EPA Region 5 (1998)	8.28E+00	EDQL EPA Region 5 (1998)
1,2-Dichloroethene	540-59-0	--		--		--		--		0.78373	EDQL EPA Region 5 (1998)	7.84E-01	EDQL EPA Region 5 (1998)
Dichlorodifluromethane	75-71-8	--		--		--		--		39.5	EDQL EPA Region 5 (1998)	3.95E+01	EDQL EPA Region 5 (1998)
2,4-Dichlorophenol	120-83-2	--		--		--		20	No Soil, only Solution, LOEC	87.5	EDQL EPA Region 5 (1998)	2.00E+01	No Soil, only Solution, LOEC
2,6-Dichlorophenol	87-65-0	--		--		--		--		1.17	EDQL EPA Region 5 (1998)	1.17E+00	EDQL EPA Region 5 (1998)
3,4-Dichlorophenol	95-77-2	20	PRGs	20	LOEC	--		20	Soil, LOEC	--		2.00E+01	PRGs
1,2-Dichloropropane	78-87-5	700	PRGs	700	LOEC	--		--		32.7	EDQL EPA Region 5 (1998)	7.00E+02	PRGs
cis-1,3-Dichloropropene	10061-01-5	--		--		--		--		0.39786	EDQL EPA Region 5 (1998)	3.98E-01	EDQL EPA Region 5 (1998)
trans-1,3-Dichloropropene	10061-02-6	--		--		--		--		0.39786	EDQL EPA Region 5 (1998)	3.98E-01	EDQL EPA Region 5 (1998)
Dieldrin	60-57-1	--		--		--		--		0.00238	EDQL EPA Region 5 (1998)	2.38E-03	EDQL EPA Region 5 (1998)
Diethylphthalate	84-66-2	100	PRGs	--		--		100	Soil, LOEC	24.8	EDQL EPA Region 5 (1998)	1.00E+02	PRGs
3,3'-Dimethylbenzidine	119-93-7	--		--		--		--		0.1042	EDQL EPA Region 5 (1998)	1.04E-01	EDQL EPA Region 5 (1998)
Dimethoate	60-51-5	--		--		--		--		0.21802	EDQL EPA Region 5 (1998)	2.18E-01	EDQL EPA Region 5 (1998)
7,12'-Dimethylbenz(a)anthracene	57-97-6	--		--		--		--		16.3	EDQL EPA Region 5 (1998)	1.63E+01	EDQL EPA Region 5 (1998)
Dimethylphthalate	131-11-3	200	PRGs	200	LOEC	--		--		734	EDQL EPA Region 5 (1998)	2.00E+02	PRGs
alpha,alpha-Dimethylphenethylamine	122-09-8	--		--		--		--		0.30016	EDQL EPA Region 5 (1998)	3.00E-01	EDQL EPA Region 5 (1998)
2,4-Dimethylphenol	105-67-9	--		--		--		--		0.01	EDQL EPA Region 5 (1998)	1.00E-02	EDQL EPA Region 5 (1998)
Di-n-butyl phthalate	84-74-2	200	PRGs	--		--		200	Soil, NOEC	0.14979	EDQL EPA Region 5 (1998)	2.00E+02	PRGs
Di-n-octylphthalate	117-84-0	--		--		--		--		709	EDQL EPA Region 5 (1998)	7.09E+02	EDQL EPA Region 5 (1998)
m-Dinitrobenzene	99-65-0	--		--		--		--		0.6547	EDQL EPA Region 5 (1998)	6.55E-01	EDQL EPA Region 5 (1998)
1,3-Dinitrobenzene	99-65-0	--		--		--		--		0.6547	EDQL EPA Region 5 (1998)	6.55E-01	EDQL EPA Region 5 (1998)
2,4-Dinitrophenol	51-28-5	20	PRGs	--		--		20	Soil, NOEC	0.06086	EDQL EPA Region 5 (1998)	2.00E+01	PRGs
2,4-Dinitrotoluene	121-14-2	--		--		--		--		1.28	EDQL EPA Region 5 (1998)	1.28E+00	EDQL EPA Region 5 (1998)
2,6-Dinitrotoluene	606-20-2	--		--		--		--		0.03283	EDQL EPA Region 5 (1998)	3.28E-02	EDQL EPA Region 5 (1998)
4,6-Dinitro-2-methylphenol	534-52-1	--		--		--		--		--		No ESV	No Source
Dinoseb	88-85-7	--		--		--		--		0.0218	EDQL EPA Region 5 (1998)	2.18E-02	EDQL EPA Region 5 (1998)
1,4-Dioxane	123-91-1	--		--		--		--		2.05	EDQL EPA Region 5 (1998)	2.05E+00	EDQL EPA Region 5 (1998)
Diphenylamine	122-39-4	--		--		--		--		1.01	EDQL EPA Region 5 (1998)	1.01E+00	EDQL EPA Region 5 (1998)
Disulfoton	298-04-4	--		--		--		--		0.01988	EDQL EPA Region 5 (1998)	1.99E-02	EDQL EPA Region 5 (1998)
Endosulfan, alpha	959-98-8	--		--		--		--		0.11927	EDQL EPA Region 5 (1998)	1.19E-01	EDQL EPA Region 5 (1998)
Endosulfan, beta	33213-65-9	--		--		--		--		0.11927	EDQL EPA Region 5 (1998)	1.19E-01	EDQL EPA Region 5 (1998)
Endosulfan, mixed isomers		--		--		--		--		--		No ESV	No Source

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Analyte	CAS Registry Number	Soil Screening Values											
		Efroymson et al. (1997a) Preliminary Remediation Goals for Ecological Endpoints[a]		Screening Value for Earthworms and Soil Microorganisms (Efroymson et al. 1997b)[b]				Soil Screening values for Plants (Efroymson et al. 1997c)[c]		Ecological Data Quality Levels (EDQL)[d]		Preferred Ecological Screening Value (ESV)[e]	
		Number (mg/kg)	Source	Benchmarks for Earthworm Number (mg/kg)	Source	Benchmarks for soil microorganism Number (mg/kg)	Source	Number mg/kg mg/L	Source (Soil) (Solution)	Number (mg/kg)	Source	Number (mg/kg)	Source
Endosulfan sulfate	1031-07-8	--		--		--		--		0.03578	EDQL EPA Region 5 (1998)	3.58E-02	EDQL EPA Region 5 (1998)
Endrin	72-20-8	--		--		--		--		0.0101	EDQL EPA Region 5 (1998)	1.01E-02	EDQL EPA Region 5 (1998)
Endrin aldehyde	7421-93-4	--		--		--		--		0.0105	EDQL EPA Region 5 (1998)	1.05E-02	EDQL EPA Region 5 (1998)
Ethyl methacrylate	97-63-2	--		--		--		--		30	EDQL EPA Region 5 (1998)	3.00E+01	EDQL EPA Region 5 (1998)
Ethylbenzene	100-41-4	--		--		--		--		5.16	EDQL EPA Region 5 (1998)	5.16E+00	EDQL EPA Region 5 (1998)
Famphur	52-85-7	--		--		--		--		0.0497	EDQL EPA Region 5 (1998)	4.97E-02	EDQL EPA Region 5 (1998)
Fluoranthene	206-44-0	--		--		--		--		122	EDQL EPA Region 5 (1998)	1.22E+02	EDQL EPA Region 5 (1998)
Fluorene	86-73-7	30	PRGs	30	LOEC	--		--		122	EDQL EPA Region 5 (1998)	3.00E+01	PRGs
Furan	110-00-9	600	PRGs	--		--		600	Soil, LOEC	--		6.00E+02	PRGs
gamma-BHC (lindane)	58-89-9	--		--		--		--		0.005	EDQL EPA Region 5 (1998)	5.00E-03	EDQL EPA Region 5 (1998)
Heptane	142-82-5	--		--		--		1	No Soil, only Solution, LOEC	--		1.00E+00	No Soil, only Solution, LOEC
Heptachlor	76-44-8	--		--		--		--		0.00598	EDQL EPA Region 5 (1998)	5.98E-03	EDQL EPA Region 5 (1998)
Heptachlor Epoxide	1024-57-3	--		--		--		--		0.15188	EDQL EPA Region 5 (1998)	1.52E-01	EDQL EPA Region 5 (1998)
Hexachlorobenzene	118-74-1	--		--		1000	LOEC	--		0.19878	EDQL EPA Region 5 (1998)	1.00E+03	LOEC
Hexachlorobutadiene	87-68-3	--		--		--		--		0.03976	EDQL EPA Region 5 (1998)	3.98E-02	EDQL EPA Region 5 (1998)
Hexachlorocyclopentadiene	77-47-4	10	PRGs	--		--		10	Soil, LOEC	0.75537	EDQL EPA Region 5 (1998)	1.00E+01	PRGs
Hexachloroethane	67-72-1	--		--		--		--		0.59634	EDQL EPA Region 5 (1998)	5.96E-01	EDQL EPA Region 5 (1998)
Hexachorophene	70-30-4	--		--		--		--		0.19878	EDQL EPA Region 5 (1998)	1.99E-01	EDQL EPA Region 5 (1998)
2-Hexanone	591-78-6	--		--		--		--		12.6	EDQL EPA Region 5 (1998)	1.26E+01	EDQL EPA Region 5 (1998)
HMX	2691-41-0	--		--		--		--		--		No ESV	No Source
Indeno(1,2,3-cd)pyrene	193-39-5	--		--		--		--		109	EDQL EPA Region 5 (1998)	1.09E+02	EDQL EPA Region 5 (1998)
Isobutyl alcohol	78-83-1	--		--		--		--		20.8	EDQL EPA Region 5 (1998)	2.08E+01	EDQL EPA Region 5 (1998)
Isodrin	465-73-6	--		--		--		--		0.00332	EDQL EPA Region 5 (1998)	3.32E-03	EDQL EPA Region 5 (1998)
Isophorone	78-59-1	--		--		--		--		139	EDQL EPA Region 5 (1998)	1.39E+02	EDQL EPA Region 5 (1998)
Isosafrole	120-58-1	--		--		--		--		9.94	EDQL EPA Region 5 (1998)	9.94E+00	EDQL EPA Region 5 (1998)
Kepone	143-50-0	--		--		--		--		0.03272	EDQL EPA Region 5 (1998)	3.27E-02	EDQL EPA Region 5 (1998)
Malathion	121-75-5	--		--		--		--		--		No ESV	No Source
Methacrylonitrile	126-98-7	--		--		--		--		0.05705	EDQL EPA Region 5 (1998)	5.71E-02	EDQL EPA Region 5 (1998)
Methapyrilene	91-80-5	--		--		--		--		2.78	EDQL EPA Region 5 (1998)	2.78E+00	EDQL EPA Region 5 (1998)
Methoxychlor	72-43-5	--		--		--		--		0.01988	EDQL EPA Region 5 (1998)	1.99E-02	EDQL EPA Region 5 (1998)
Methyl bromide	74-83-9	--		--		--		--		0.23516	EDQL EPA Region 5 (1998)	2.35E-01	EDQL EPA Region 5 (1998)
Methyl chloride	74-87-3	--		--		--		--		10.4	EDQL EPA Region 5 (1998)	1.04E+01	EDQL EPA Region 5 (1998)
Methyl iodide	74-88-4	--		--		--		--		1.23	EDQL EPA Region 5 (1998)	1.23E+00	EDQL EPA Region 5 (1998)
Methylene chloride	75-09-2	--		--		--		--		--		No ESV	No Source
2-Methylnaphthalene	91-57-6	--		--		--		--		3.24	EDQL EPA Region 5 (1998)	3.24E+00	EDQL EPA Region 5 (1998)
2-Methylphenol	95-48-7	--		--		--		--		--		No ESV	No Source
4-Methylphenol	106-44-5	--		--		--		--		--		No ESV	No Source
4-Methyl-2-pentanone	108-10-1	--		--		--		--		--		No ESV	No Source
Mirex	2385-85-5	--		--		--		--		--		No ESV	No Source
Naphthalene	91-20-3	--		--		--		10	No Soil, only Solution, LOEC	0.09939	EDQL EPA Region 5 (1998)	1.00E+01	No Soil, only Solution, LOEC
1-Naphthylamine	134-32-7	--		--		--		--		9.34	EDQL EPA Region 5 (1998)	9.34E+00	EDQL EPA Region 5 (1998)

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Analyte	CAS Registry Number	Soil Screening Values											
		Efroymson et al. (1997a) Preliminary Remediation Goals for Ecological Endpoints[a]		Screening Value for Earthworms and Soil Microorganisms (Efroymson et al. 1997b)[b]				Soil Screening values for Plants (Efroymson et al. 1997c)[c]		Ecological Data Quality Levels (EDQL)[d]		Preferred Ecological Screening Value (ESV)[e]	
		Number (mg/kg)	Source	Benchmarks for Earthworm Number (mg/kg)	Source	Benchmarks for soil microorganism Number (mg/kg)	Source	Number mg/kg mg/L	Source (Soil) (Solution)	Number (mg/kg)	Source	Number (mg/kg)	Source
2-Naphthylamine	91-59-8	--		--		--		--		3.03	EDQL EPA Region 5 (1998)	3.03E+00	EDQL EPA Region 5 (1998)
1,4-Naphthoquinone	130-15-4	--		--		--		--		1.67	EDQL EPA Region 5 (1998)	1.67E+00	EDQL EPA Region 5 (1998)
m-Nitroaniline	99-09-2	--		--		--		--		3.16	EDQL EPA Region 5 (1998)	3.16E+00	EDQL EPA Region 5 (1998)
o-Nitroaniline	88-74-4	--		--		--		--		74.1	EDQL EPA Region 5 (1998)	7.41E+01	EDQL EPA Region 5 (1998)
p-Nitroaniline	100-01-6	--		--		--		--		21.9	EDQL EPA Region 5 (1998)	2.19E+01	EDQL EPA Region 5 (1998)
2-Nitroaniline	88-74-4	--		--		--		--		--		No ESV	No Source
3-Nitroaniline	99-09-2	--		--		--		70	No Soil, only Solution, LOEC	--		7.00E+01	No Soil, only Solution, LOEC
4-Nitroaniline	100-01-6	--		--		--		40	No Soil, only Solution, LOEC	--		4.00E+01	No Soil, only Solution, LOEC
Nitrobenzene	99-95-3	40	PRGs	40	LOEC	1000	LOEC	8	No Soil, only Solution, LOEC	1.31	EDQL EPA Region 5 (1998)	4.00E+01	PRGs
Nitrocellulose	9004-70-0	--		--		--		--		--		No ESV	No Source
Nitroglycerin	55-63-0	--		--		--		--		--		No ESV	No Source
Nitroquanidine		--		--		--		--		--		No ESV	No Source
o-Nitrophenol	88-75-5	--		--		--		--		1.6	EDQL EPA Region 5 (1998)	1.60E+00	EDQL EPA Region 5 (1998)
p-Nitrophenol	100-02-7	--		--		--		--		5.12	EDQL EPA Region 5 (1998)	5.12E+00	EDQL EPA Region 5 (1998)
2-Nitrophenol	88-75-5	--		--		--		--		--		No ESV	No Source
4-Nitrophenol	100-02-7	7	PRGs	7	LOEC	--		10	No Soil, only Solution, LOEC	--		7.00E+00	PRGs
4-Nitroquinoline-1-oxide	56-57-5	--		--		--		--		0.12222	EDQL EPA Region 5 (1998)	1.22E-01	EDQL EPA Region 5 (1998)
3-Nitrotoluene	99-08-1	--		--		--		--		--		No ESV	No Source
N-Nitrosodiethylamine	55-18-5	--		--		--		--		0.06933	EDQL EPA Region 5 (1998)	6.93E-02	EDQL EPA Region 5 (1998)
N-Nitrosodimethylamine	62-75-9	--		--		--		--		3.2E-05	EDQL EPA Region 5 (1998)	3.21E-05	EDQL EPA Region 5 (1998)
N-Nitrosomethylamine	10595-95-6	--		--		--		--		0.00166	EDQL EPA Region 5 (1998)	1.66E-03	EDQL EPA Region 5 (1998)
N-Nitrosomorpholine	59-89-2	--		--		--		--		0.07057	EDQL EPA Region 5 (1998)	7.06E-02	EDQL EPA Region 5 (1998)
N-Nitrosopiperidine	100-75-4	--		--		--		--		0.00665	EDQL EPA Region 5 (1998)	6.65E-03	EDQL EPA Region 5 (1998)
N-Nitrosopyrrolidine	930-55-2	--		--		--		--		0.01256	EDQL EPA Region 5 (1998)	1.26E-02	EDQL EPA Region 5 (1998)
N-nitroso-di-n-dipropylamine	621-64-7	--		--		--		--		0.54368	EDQL EPA Region 5 (1998)	5.44E-01	EDQL EPA Region 5 (1998)
N-nitrosodiphenylamine	86-30-6	20	PRGs	20	LOEC	--		--		0.54514	EDQL EPA Region 5 (1998)	2.00E+01	PRGs
2-Nitrotoluene	88-72-2	--		--		--		--		--		No ESV	No Source
5-nitro-o-Toluidine	99-55-8	--		--		--		--		8.73	EDQL EPA Region 5 (1998)	8.73E+00	EDQL EPA Region 5 (1998)
2,2'- oxybis(1-Chloropropane)	108-60-1	--		--		--		--		--		No ESV	No Source
Parathion	56-38-2	--		--		--		--		0.00034	EDQL EPA Region 5 (1998)	3.40E-04	EDQL EPA Region 5 (1998)
PCDD-S		--		--		--		--		2E-07	EDQL EPA Region 5 (1998)	1.99E-07	EDQL EPA Region 5 (1998)
Pentachlorophenol	87-86-5	3	PRGs	6	NOEC	400	LOEC	3	Soil, LOEC	0.11927	EDQL EPA Region 5 (1998)	3.00E+00	PRGs
Pentachloroaniline	527-20-8	100	PRGs	100	LOEC	--		--		--		1.00E+02	PRGs
Pentachlorobenzene	608-93-5	20	PRGs	20	LOEC	--		--		0.49695	EDQL EPA Region 5 (1998)	2.00E+01	PRGs
Pentachloroethane	76-01-7	--		--		--		--		10.7	EDQL EPA Region 5 (1998)	1.07E+01	EDQL EPA Region 5 (1998)
Pentachloronitrobenzene	82-68-8	--		--		--		--		7.09	EDQL EPA Region 5 (1998)	7.09E+00	EDQL EPA Region 5 (1998)
Phenacetin	62-44-2	--		--		--		--		11.7	EDQL EPA Region 5 (1998)	1.17E+01	EDQL EPA Region 5 (1998)
Phenanthrene	85-01-8	--		--		--		--		45.7	EDQL EPA Region 5 (1998)	4.57E+01	EDQL EPA Region 5 (1998)
Phenol	108-95-2	30	PRGs	30	LOEC	100	LOEC	70	Soil, LOEC	120	EDQL EPA Region 5 (1998)	3.00E+01	PRGs
p-Phenylenediamine	106-50-3	--		--		--		--		6.16	EDQL EPA Region 5 (1998)	6.16E+00	EDQL EPA Region 5 (1998)
phorate	298-02-2	--		--		--		--		0.0005	EDQL EPA Region 5 (1998)	4.96E-04	EDQL EPA Region 5 (1998)

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				Benchmarks for Earthworm		Benchmarks for soil microorganism							
		Number (mg/kg)	Source	Number (mg/kg)	Source	Number (mg/kg)	Source	Number mg/kg mg/L	Source (Soil) (Solution)	Number (mg/kg)	Source	Number (mg/kg)	Source
2-Picoline	109-06-8	--		--		--		--		9.9	EDQL EPA Region 5 (1998)	9.90E+00	EDQL EPA Region 5 (1998)
Polynuclear aromatic hydrocarbons		--		--		--		--		--		No ESV	No Source
Polychlorinated biphenyls	1336-36-3	0.371	PRGs	--		--		40	Soil, NOEC	0.00033	EDQL EPA Region 5 (1998)	3.71E-01	PRGs
Polychlorinated dibenzofurans	51207-31-9	--		--		--		--		3.9E-05	EDQL EPA Region 5 (1998)	3.86E-05	EDQL EPA Region 5 (1998)
Pronamide	23950-58-5	--		--		--		--		0.0136	EDQL EPA Region 5 (1998)	1.36E-02	EDQL EPA Region 5 (1998)
Propionitrile	107-12-0	--		--		--		--		0.04983	EDQL EPA Region 5 (1998)	4.98E-02	EDQL EPA Region 5 (1998)
4-Nitrotoluene	99-99-0	--		--		--		--		--		No ESV	No Source
Pyrene	129-00-0	--		--		--		--		78.5	EDQL EPA Region 5 (1998)	7.85E+01	EDQL EPA Region 5 (1998)
Pryidine	110-86-1	--		--		--		--		1.03	EDQL EPA Region 5 (1998)	1.03E+00	EDQL EPA Region 5 (1998)
RDX (cyclonite) Hexahydro-1,3,5-trinitro-1,3,5-triazine	121-82-4	--		--		--		--		--		No ESV	No Source
Safrole	94-59-7	--		--		--		--		0.40398	EDQL EPA Region 5 (1998)	4.04E-01	EDQL EPA Region 5 (1998)
2,4,5-TP (Silvex)	93-72-1	--		--		--		--		0.1088	EDQL EPA Region 5 (1998)	1.09E-01	EDQL EPA Region 5 (1998)
Styrene	100-42-5	300	PRGs	--		--		300	Soil	4.69	EDQL EPA Region 5 (1998)	3.00E+02	PRGs
TCDD		3.15E-06	PRGs									3.15E-06	PRGs
TCDF		8.40E-04	PRGs									8.40E-04	PRGs
2,3,5,6-Tetrachloroaniline	3481-20-7	20	PRGs	20	LOEC	--		20	Soil, LOEC	--		2.00E+01	PRGs
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	--		--		--		--		2E-07	EDQL EPA Region 5 (1998)	1.99E-07	EDQL EPA Region 5 (1998)
1,2,4,5-Tetrachlorobenzene	95-94-3	--		--		--		--		2.02	EDQL EPA Region 5 (1998)	2.02E+00	EDQL EPA Region 5 (1998)
1,2,3,4-Tetrachlorobenzene	634-66-2	10	PRGs	10	LOEC	--		--		--		1.00E+01	PRGs
Tetrachloroethene	127-18-4	--		--		--		10	No Soil, only Solution	9.92	EDQL EPA Region 5 (1998)	1.00E+01	No Soil, only Solution
Tetrachloroethylene	127-18-4	--		--		--		--		--		No ESV	No Source
1,1,1,2-Tetrachloroethane	630-20-6	--		--		--		--		225	EDQL EPA Region 5 (1998)	2.25E+02	EDQL EPA Region 5 (1998)
1,1,2,2-Tetrachloroethane	79-34-5	--		--		--		--		0.12722	EDQL EPA Region 5 (1998)	1.27E-01	EDQL EPA Region 5 (1998)
Tetrachloromethane	56-23-5	--		--		--		--		--		No ESV	No Source
2,3,4,5-Tetrachlorophenol	4901-51-3	20	PRGs	20	LOEC	--		--		--		2.00E+01	PRGs
2,3,4,6-Tetrachlorophenol	58-90-2	--		--		--		--		0.19878	EDQL EPA Region 5 (1998)	1.99E-01	EDQL EPA Region 5 (1998)
Tetraethyl dithiopyrophosphate	3689-24-5	--		--		--		--		0.59634	EDQL EPA Region 5 (1998)	5.96E-01	EDQL EPA Region 5 (1998)
Tetryl	479-45-8	--		--		--		--		--		No ESV	No Source
Toluene	108-88-3	200	PRGs	--		--		200	Soil, NOEC	5.45	EDQL EPA Region 5 (1998)	2.00E+02	PRGs
o-Toluidine	95-53-4	--		--		--		--		2.97	EDQL EPA Region 5 (1998)	2.97E+00	EDQL EPA Region 5 (1998)
4-Toluidine	106-49-0	--		--		--		100	No Soil, only Solution, LOEC	--		1.00E+02	No Soil, only Solution, LOEC
Toxaphene	8001-35-2	--		--		--		--		0.11927	EDQL EPA Region 5 (1998)	1.19E-01	EDQL EPA Region 5 (1998)
Tribromomethane	75-25-2	--		--		--		--		--		No ESV	No Source
2,4,5-Trichloroaniline	636-30-6	20	PRGs	20	LOEC	--		20	Soil, LOEC	--		2.00E+01	PRGs
Trichloroethene	79-01-6	--		--		--		100	No Soil, only Solution	--		1.00E+02	No Soil, only Solution
1,2,3-Trichlorobenzene	87-61-6	20	PRGs	20	LOEC	--		--		--		2.00E+01	PRGs
1,2,4-Trichlorobenzene	120-82-1	20	PRGs	20	LOEC	--		--		11.1	EDQL EPA Region 5 (1998)	2.00E+01	PRGs
1,1,1-Trichloroethane	71-55-6	--		--		--		--		29.8	EDQL EPA Region 5 (1998)	2.98E+01	EDQL EPA Region 5 (1998)
1,1,2-Trichloroethane	79-00-5	--		--		--		--		28.6	EDQL EPA Region 5 (1998)	2.86E+01	EDQL EPA Region 5 (1998)
Trichloroethylene	79-01-6	--		--		--		--		12.4	EDQL EPA Region 5 (1998)	1.24E+01	EDQL EPA Region 5 (1998)
Trichlorofluoromethane	75-69-4	--		--		--		--		16.4	EDQL EPA Region 5 (1998)	1.64E+01	EDQL EPA Region 5 (1998)

Appendix Table R-1. Soil Ecological Screening Values For Load Line 4 at Ravenna, Ohio

Analyte	CAS Registry Number	Soil Screening Values											
		Efroymson et al. (1997a) Preliminary Remediation Goals for Ecological Endpoints[a]		Screening Value for Earthworms and Soil Microorganisms (Efroymson et al. 1997b)[b]				Soil Screening values for Plants (Efroymson et al. 1997c)[c]		Ecological Data Quality Levels (EDQL)[d]		Preferred Ecological Screening Value (ESV)[e]	
		Number (mg/kg)	Source	Benchmarks for Earthworm Number (mg/kg)	Source	Benchmarks for soil microorganism Number (mg/kg)	Source	Number mg/kg mg/L	Source (Soil) (Solution)	Number (mg/kg)	Source	Number (mg/kg)	Source
2,4,5-Trichlorophenol	95-95-4	9	PRGs	9	LOEC	--		4	Soil, LOEC	14.1	EDQL EPA Region 5 (1998)	9.00E+00	PRGs
2,4,6-Trichlorophenol	88-06-2	4	PRGs	10	LOEC	--		10	No Soil, only Solution, LOEC	9.94	EDQL EPA Region 5 (1998)	4.00E+00	PRGs
1,2,3-Trichloropropane	96-18-4	--		--		--		--		3.36	EDQL EPA Region 5 (1998)	3.36E+00	EDQL EPA Region 5 (1998)
2,4,5-Trichlorophenoxyacetic acid	93-76-5	--		--		--		--		0.59634	EDQL EPA Region 5 (1998)	5.96E-01	EDQL EPA Region 5 (1998)
1,3,5-Trinitrobenzene	99-35-4	--		--		--		--		0.37615	EDQL EPA Region 5 (1998)	8.60E-01	PPL (SAIC 2002)
2,4,6-Trinitrotoluene	118-96-7	--		--		--		--		--		7.10E+01	PPL (SAIC 2002)
Vinyl acetate	108-05-4	--		--		--		--		12.7	EDQL EPA Region 5 (1998)	1.27E+01	EDQL EPA Region 5 (1998)
Vinyl chloride	75-01-4	--		--		--		--		0.64614	EDQL EPA Region 5 (1998)	6.46E-01	EDQL EPA Region 5 (1998)
Xylenes (total)	1330-20-7	--		--		--		100	No Soil, only Solution, LOEC	10	EDQL EPA Region 5 (1998)	1.00E+02	No Soil, only Solution, LOEC

[a] Efroymson, R.A, G.W Suter, II, B.E. Sample, and D.S. Jones. (1997a). Preliminary Remediation Goals for Ecological Endpoints. ES/ER/TM-162/R2.

[b] Efroymson, R.A, M.E Will., and G.W Suter, 1997b Toxicological Benchmarks for Potential Contaminants of Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process

Martin Marietta Energy Systems, INC. ES/ER/TM-126/R1 Oak Ridge National Laboratory, Oak Ridge, TN

[c] Efroymson,R. A., M.E. Will, G.W. Suter , and A.C. Wooten, 1997c. Toxicological Benchmarks for Screening Contaminants of Concern for Effects on Terrestrial Plants: 1997 Revision

Lockheed Martin Energy Systems, INC. ES/ER/TM-85/R3 Oak Ridge National Laboratory, Oak Ridge, TN

[d] Ecological Data Quality Levels (EDQL), U.S. EPA Region 5, Final Technical Approach for Developing EDQLs for RCRA Appendix IX Constituents and Other Significant Contaminants of Ecological Concern, April 1998

[e] The Prefered Soil Value heirarcy is as follows: Efroymson et al. (1997a), followed by Efroymson et al. (1997b), followed by Efroymson et al. (1997c), followed by EDQLs. Note that plant protection levels (PPLs) (SAIC 2002) that were developed for Winklepe

NOEC = No Observed Effect Concentration

LOEC = Lowest Observed Effect Concentration

Diss = Dissolved Analyte

-- = no value

PRGs = Preliminary Remediation Goals

Appendix Table R-2. Derivation of Sediment Ecological Screening Values for Load Line 4, Ravenna, Ohio

Analyte	CAS Registry Number	Sediment Screening Values					
		Consensus-Based Sediment Quality Guidelines[a]		Ecological Data Quality Levels (EDQL)[b]		Preferred Ecological Screening Value (ESV)[c]	
		Number	Source	Number	Source	Number	Source
Metals							
(Target Analyte List)		(mg/kg)		(mg/kg)		(mg/kg)	
Aluminum	7429-90-5					No ESV	No Source
Antimony	7440-36-0					No ESV	No Source
Arsenic	7440-38-2	9.79	MacDonald et al. (2000)	5.9	EDQL EPA Region 5 (1998)	9.79E+00	MacDonald et al. (2000)
Barium	7440-39-3					No ESV	No Source
Beryllium	7440-41-7					No ESV	No Source
Cadmium	7440-43-9	0.99	MacDonald et al. (2000)	0.596	EDQL EPA Region 5 (1998)	9.90E-01	MacDonald et al. (2000)
Calcium	7440-70-2					No ESV	No Source
Chromium	7440-47-3	43.4	MacDonald et al. (2000)	26	EDQL EPA Region 5 (1998)	4.34E+01	MacDonald et al. (2000)
Chromium, hexavalent	7440-47-3	43.4	MacDonald et al. (2000)	26	EDQL EPA Region 5 (1998)	4.34E+01	MacDonald et al. (2000)
Cobalt	7440-48-4			50	EDQL EPA Region 5 (1998)	5.00E+01	EDQL EPA Region 5 (1998)
Copper	7440-50-8	31.6	MacDonald et al. (2000)	16	EDQL EPA Region 5 (1998)	3.16E+01	MacDonald et al. (2000)
Cyanide	57-12-5			0.0001	EDQL EPA Region 5 (1998)	1.00E-04	EDQL EPA Region 5 (1998)
Iron	7439-89-6					No ESV	No Source
Lead	7439-92-1	35.8	MacDonald et al. (2000)	31	EDQL EPA Region 5 (1998)	3.58E+01	MacDonald et al. (2000)
Magnesium	7439-95-4					No ESV	No Source
Manganese	7439-96-5					No ESV	No Source
Mercury	7439-97-6	0.18	MacDonald et al. (2000)	0.174	EDQL EPA Region 5 (1998)	1.80E-01	MacDonald et al. (2000)
Nickel	7440-02-0	22.7	MacDonald et al. (2000)	16	EDQL EPA Region 5 (1998)	2.27E+01	MacDonald et al. (2000)
Potassium	7440-07-7					No ESV	No Source
Selenium	7782-49-2					No ESV	No Source
Silver	7440-22-4			0.5	EDQL EPA Region 5 (1998)	5.00E-01	EDQL EPA Region 5 (1998)
Sodium	7440-23-5					No ESV	No Source
Thallium	7440-28-0					No ESV	No Source
Vanadium	7440-62-2					No ESV	No Source

Appendix Table R-2. Derivation of Sediment Ecological Screening Values for Load Line 4, Ravenna, Ohio

Analyte	CAS Registry Number	Sediment Screening Values					
		Consensus-Based Sediment Quality Guidelines[a]		Ecological Data Quality Levels (EDQL)[b]		Preferred Ecological Screening Value (ESV)[c]	
		Number	Source	Number	Source	Number	Source
Zinc	7440-66-6	121	MacDonald et al. (2000)	120	EDQL EPA Region 5 (1998)	1.21E+02	MacDonald et al. (2000)
Organic Compounds		(mg/kg)		(mg/kg)			
Acenaphthene	83-32-9			0.00671	EDQL EPA Region 5 (1998)	6.71E-03	EDQL EPA Region 5 (1998)
Acenaphthylene	208-96-8			0.00587	EDQL EPA Region 5 (1998)	5.87E-03	EDQL EPA Region 5 (1998)
Acetone	67-64-1			0.45337	EDQL EPA Region 5 (1998)	4.53E-01	EDQL EPA Region 5 (1998)
Aldrin	309-00-2			0.002	EDQL EPA Region 5 (1998)	2.00E-03	EDQL EPA Region 5 (1998)
Anthracene	120-12-7	0.0572	MacDonald et al. (2000)	0.0469	EDQL EPA Region 5 (1998)	5.72E-02	MacDonald et al. (2000)
Arochlor-1016	12674-11-2			3.41E-01	EDQL EPA Region 5 (1998)	3.41E-01	EDQL EPA Region 5 (1998)[d]
Arochlor-1221	11104-28-2			3.41E-01	EDQL EPA Region 5 (1998)	3.41E-01	EDQL EPA Region 5 (1998)[d]
Arochlor-1232	11141-16-5			3.41E-01	EDQL EPA Region 5 (1998)	3.41E-01	EDQL EPA Region 5 (1998)[d]
Arochlor-1242	53469-21-9			3.41E-01	EDQL EPA Region 5 (1998)	3.41E-01	EDQL EPA Region 5 (1998)[d]
Arochlor-1248	12672-29-6			3.41E-01	EDQL EPA Region 5 (1998)	3.41E-01	EDQL EPA Region 5 (1998)[d]
PCB-1248	12672-29-6			3.41E-01	EDQL EPA Region 5 (1998)	3.41E-01	EDQL EPA Region 5 (1998)[d]
PCB-1254	11097-69-1			3.41E-01	EDQL EPA Region 5 (1998)	3.41E-01	EDQL EPA Region 5 (1998)[d]
Arochlor-1260	11096-82-5			3.41E-01	EDQL EPA Region 5 (1998)	3.41E-01	EDQL EPA Region 5 (1998)[d]
Benzene	71-43-2			0.14157	EDQL EPA Region 5 (1998)	1.42E-01	EDQL EPA Region 5 (1998)
Benzenemethanol	100-51-6					No ESV	No Source
Benz(a)anthracene	56-55-3	0.108	MacDonald et al. (2000)	0.0317	EDQL EPA Region 5 (1998)	1.08E-01	MacDonald et al. (2000)
Benzo(a)pyrene	50-32-8	0.15	MacDonald et al. (2000)	0.0319	EDQL EPA Region 5 (1998)	1.50E-01	MacDonald et al. (2000)
Benzo(b)fluoranthene	205-99-2			10.4	EDQL EPA Region 5 (1998)	1.04E+01	EDQL EPA Region 5 (1998)
Benzo(ghi)perylene	191-24-2			0.17	EDQL EPA Region 5 (1998)	1.70E-01	EDQL EPA Region 5 (1998)
Benzo(k)fluoranthene	207-08-9			0.24	EDQL EPA Region 5 (1998)	2.40E-01	EDQL EPA Region 5 (1998)
Benzoic acid	65-85-0					No ESV	No Source
BHC	608-73-1					No ESV	No Source
BHC, alpha	319-84-6			0.006	EDQL EPA Region 5 (1998)	6.00E-03	EDQL EPA Region 5 (1998)
Beta-BHC	319-85-7			0.005	EDQL EPA Region 5 (1998)	5.00E-03	EDQL EPA Region 5 (1998)

Appendix Table R-2. Derivation of Sediment Ecological Screening Values for Load Line 4, Ravenna, Ohio

Analyte	CAS Registry Number	Sediment Screening Values					
		Consensus-Based Sediment Quality Guidelines[a]		Ecological Data Quality Levels (EDQL)[b]		Preferred Ecological Screening Value (ESV)[c]	
		Number	Source	Number	Source	Number	Source
Biphenyl	92-52-4					No ESV	No Source
bis(2-chloroethoxy) methane	111-91-1			0.34971	EDQL EPA Region 5 (1998)	3.50E-01	EDQL EPA Region 5 (1998)
bis(2-Chloroethyl) ether	111-44-4			0.21196	EDQL EPA Region 5 (1998)	2.12E-01	EDQL EPA Region 5 (1998)
Bis(2-chloroisopropyl) ether	108-60-1			0.0687	EDQL EPA Region 5 (1998)	6.87E-02	EDQL EPA Region 5 (1998)
bis(2-Ethylhexyl)phthalate	117-81-7			0.182	EDQL EPA Region 5 (1998)	1.82E-01	EDQL EPA Region 5 (1998)
Bromodichloromethane	74-97-5			0.00113	EDQL EPA Region 5 (1998)	1.13E-03	EDQL EPA Region 5 (1998)
Bromochloromethane	74-97-5					No ESV	No Source
Bromoform	75-25-2			0.996	EDQL EPA Region 5 (1998)	9.96E-01	EDQL EPA Region 5 (1998)
Bromomethane	74-83-9			0.000148	EDQL EPA Region 5 (1998)	1.48E-04	EDQL EPA Region 5 (1998)
4-bromophenyl-phenylether	101-55-3			1.55	EDQL EPA Region 5 (1998)	1.55E+00	EDQL EPA Region 5 (1998)
2-Butanone	78-93-3			0.13696	EDQL EPA Region 5 (1998)	1.37E-01	EDQL EPA Region 5 (1998)
Butylbenzylphthalate	85-68-7			4.19	EDQL EPA Region 5 (1998)	4.19E+00	EDQL EPA Region 5 (1998)
Carbazole	86-74-8					No ESV	No Source
Carbon disulfide	75-15-0			0.13397	EDQL EPA Region 5 (1998)	1.34E-01	EDQL EPA Region 5 (1998)
Carbon tetrachloride	56-23-5			0.03573	EDQL EPA Region 5 (1998)	3.57E-02	EDQL EPA Region 5 (1998)
4-Chloroaniline	106-47-8			0.14608	EDQL EPA Region 5 (1998)	1.46E-01	EDQL EPA Region 5 (1998)
Chlorobenzene	108-90-7			0.06194	EDQL EPA Region 5 (1998)	6.19E-02	EDQL EPA Region 5 (1998)
alpha-Chlordane	5103-71-9	0.00324	MacDonald et al. (2000)	0.0045	EDQL EPA Region 5 (1998)	3.24E-03	MacDonald et al. (2000)
gamma-Chlordane	5103-74-2	0.00324	MacDonald et al. (2000)	0.0045	EDQL EPA Region 5 (1998)	3.24E-03	MacDonald et al. (2000)
Chloroethane	75-00-3			58.6	EDQL EPA Region 5 (1998)	5.86E+01	EDQL EPA Region 5 (1998)
Chloroform	67-66-3			0.027	EDQL EPA Region 5 (1998)	2.70E-02	EDQL EPA Region 5 (1998)
Chloromethane	74-87-3			0.0000785	EDQL EPA Region 5 (1998)	7.85E-05	EDQL EPA Region 5 (1998)
2-Chloronaphthalene	91-58-7			0.41723	EDQL EPA Region 5 (1998)	4.17E-01	EDQL EPA Region 5 (1998)
2-Chlorophenol	95-57-8			0.0117	EDQL EPA Region 5 (1998)	1.17E-02	EDQL EPA Region 5 (1998)
4-Chlorobenzenamine	106-47-8			0.14608	EDQL EPA Region 5 (1998)	1.46E-01	EDQL EPA Region 5 (1998)
4-Chlorophenyl-phenyl ether	7005-72-3			0.65612	EDQL EPA Region 5 (1998)	6.56E-01	EDQL EPA Region 5 (1998)

Appendix Table R-2. Derivation of Sediment Ecological Screening Values for Load Line 4, Ravenna, Ohio

Analyte	CAS Registry Number	Sediment Screening Values					
		Consensus-Based Sediment Quality Guidelines[a]		Ecological Data Quality Levels (EDQL)[b]		Preferred Ecological Screening Value (ESV)[c]	
		Number	Source	Number	Source	Number	Source
4-chloro-3-methylphenol	59-50-7			0.38818	EDQL EPA Region 5 (1998)	3.88E-01	EDQL EPA Region 5 (1998)
Chrysene	218-01-9	0.166	MacDonald et al. (2000)	0.0571	EDQL EPA Region 5 (1998)	1.66E-01	MacDonald et al. (2000)
4,4'-DDD	72-54-8	0.00488	MacDonald et al. (2000)	0.00553	EDQL EPA Region 5 (1998)	4.88E-03	MacDonald et al. (2000)
4,4'-DDE	72-55-9	0.00316	MacDonald et al. (2000)	0.00142	EDQL EPA Region 5 (1998)	3.16E-03	MacDonald et al. (2000)
4,4'-DDT	50-29-3	0.00416	MacDonald et al. (2000)	0.00119	EDQL EPA Region 5 (1998)	4.16E-03	MacDonald et al. (2000)
Diazinon	333-41-5					No ESV	No Source
Dibenz(a,h)anthracene	53-70-3	0.033	MacDonald et al. (2000)	0.00622	EDQL EPA Region 5 (1998)	3.30E-02	MacDonald et al. (2000)
Dibenzofuran	132-64-9			1.52	EDQL EPA Region 5 (1998)	1.52E+00	EDQL EPA Region 5 (1998)
Dibromochloromethane	124-48-1			0.26761	EDQL EPA Region 5 (1998)	2.68E-01	EDQL EPA Region 5 (1998)
1,2-Dibromoethane	106-93-4			0.01237	EDQL EPA Region 5 (1998)	1.24E-02	EDQL EPA Region 5 (1998)
1,2-Dichlorobenzene	95-50-1			0.23132	EDQL EPA Region 5 (1998)	2.31E-01	EDQL EPA Region 5 (1998)
1,3-Dichlorobenzene	541-73-1			3.01	EDQL EPA Region 5 (1998)	3.01E+00	EDQL EPA Region 5 (1998)
1,4-Dichlorobenzene	106-46-7			1.45	EDQL EPA Region 5 (1998)	1.45E+00	EDQL EPA Region 5 (1998)
3,3'-Dichlorobenzidine	91-94-1			0.02822	EDQL EPA Region 5 (1998)	2.82E-02	EDQL EPA Region 5 (1998)
1,1-Dichloroethane	75-34-3			0.000575	EDQL EPA Region 5 (1998)	5.75E-04	EDQL EPA Region 5 (1998)
1,2-Dichloroethane	107-06-2			0.05418	EDQL EPA Region 5 (1998)	5.42E-02	EDQL EPA Region 5 (1998)
1,1-Dichloroethene	75-35-4			0.02327	EDQL EPA Region 5 (1998)	2.33E-02	EDQL EPA Region 5 (1998)
1,2-Dichloroethene	540-59-0					No ESV	No Source
2,4-Dichlorophenol	120-83-2			0.13363	EDQL EPA Region 5 (1998)	1.34E-01	EDQL EPA Region 5 (1998)
1,2-Dichloropropane	78-87-5			0.35161	EDQL EPA Region 5 (1998)	3.52E-01	EDQL EPA Region 5 (1998)
cis-1,3-Dichloropropene	10061-02-6			0.00296	EDQL EPA Region 5 (1998)	2.96E-03	EDQL EPA Region 5 (1998)
trans-1,3-Dichloropropene	10061-02-6			0.00296	EDQL EPA Region 5 (1998)	2.96E-03	EDQL EPA Region 5 (1998)
Dieldrin	60-57-1	0.0019	MacDonald et al. (2000)	0.002	EDQL EPA Region 5 (1998)	1.90E-03	MacDonald et al. (2000)
Diethylphthalate	84-66-2			0.00804	EDQL EPA Region 5 (1998)	8.04E-03	EDQL EPA Region 5 (1998)
Dimethylbenzene	1330-20-7			1.88	EDQL EPA Region 5 (1998)	1.88E+00	EDQL EPA Region 5 (1998)
Dimethylphthalate	131-11-3			0.02495	EDQL EPA Region 5 (1998)	2.50E-02	EDQL EPA Region 5 (1998)

Appendix Table R-2. Derivation of Sediment Ecological Screening Values for Load Line 4, Ravenna, Ohio

Analyte	CAS Registry Number	Sediment Screening Values					
		Consensus-Based Sediment Quality Guidelines[a]		Ecological Data Quality Levels (EDQL)[b]		Preferred Ecological Screening Value (ESV)[c]	
		Number	Source	Number	Source	Number	Source
2,4-Dimethylphenol	105-67-9			0.30453	EDQL EPA Region 5 (1998)	3.05E-01	EDQL EPA Region 5 (1998)
Di-n-butylphthalate	84-74-2			0.1105	EDQL EPA Region 5 (1998)	1.11E-01	EDQL EPA Region 5 (1998)
Di-n-octylphthalate	117-84-0			40.6	EDQL EPA Region 5 (1998)	4.06E+01	EDQL EPA Region 5 (1998)
1,3-Dinitrobenzene	99-65-0			0.000924	EDQL EPA Region 5 (1998)	9.24E-04	EDQL EPA Region 5 (1998)
2,4-Dinitrophenol	51-28-5			0.00133	EDQL EPA Region 5 (1998)	1.33E-03	EDQL EPA Region 5 (1998)
2,4-Dinitrotoluene	121-14-2			0.07513	EDQL EPA Region 5 (1998)	7.51E-02	EDQL EPA Region 5 (1998)
2,6-Dinitrotoluene	606-20-2			0.02062	EDQL EPA Region 5 (1998)	2.06E-02	EDQL EPA Region 5 (1998)
2-Amino-4,6-Dinitrotoluene	35572-78-2					No ESV	No Source
4-Amino-2,6-Dinitrotoluene	19406-51-0					No ESV	No Source
2-Methyl-4,6-dinitrophenol	534-52-1			0.01038	EDQL EPA Region 5 (1998)	1.04E-02	EDQL EPA Region 5 (1998)
4,6-Dinitro-2-methylphenol	534-52-1			0.01038	EDQL EPA Region 5 (1998)	1.04E-02	EDQL EPA Region 5 (1998)
Endosulfan, alpha	959-98-8			0.000175	EDQL EPA Region 5 (1998)	1.75E-04	EDQL EPA Region 5 (1998)
Endosulfan, beta	33213-65-9			0.000104	EDQL EPA Region 5 (1998)	1.04E-04	EDQL EPA Region 5 (1998)
Endosulfan, mixed isomers						No ESV	No Source
Endosulfan sulfate	1031-07-8			0.0346	EDQL EPA Region 5 (1998)	3.46E-02	EDQL EPA Region 5 (1998)
Endrin	72-20-8	0.00222	MacDonald et al. (2000)	0.00267	EDQL EPA Region 5 (1998)	2.22E-03	MacDonald et al. (2000)
Endrin aldehyde	7421-93-4			3.2	EDQL EPA Region 5 (1998)	3.20E+00	EDQL EPA Region 5 (1998)
Endrin ketone	53494-70-5					No ESV	No Source
Ethylbenzene	100-41-4			0.0001	EDQL EPA Region 5 (1998)	1.00E-04	EDQL EPA Region 5 (1998)
Fluoranthene	206-44-0	0.423	MacDonald et al. (2000)	0.1113	EDQL EPA Region 5 (1998)	4.23E-01	MacDonald et al. (2000)
Fluorene	86-73-7	0.0774	MacDonald et al. (2000)	0.0212	EDQL EPA Region 5 (1998)	7.74E-02	MacDonald et al. (2000)
gamma-BHC (lindane)	58-89-9	0.00237	MacDonald et al. (2000)	0.00094	EDQL EPA Region 5 (1998)	2.37E-03	MacDonald et al. (2000)
Heptachlor	76-44-8			0.0006	EDQL EPA Region 5 (1998)	6.00E-04	EDQL EPA Region 5 (1998)
Heptachlor Epoxide	1024-57-3	0.00247	MacDonald et al. (2000)	0.0006	EDQL EPA Region 5 (1998)	2.47E-03	MacDonald et al. (2000)
Hexachlorobenzene	118-74-1			0.02	EDQL EPA Region 5 (1998)	2.00E-02	EDQL EPA Region 5 (1998)
Hexachlorobutadiene	87-68-3			1.38	EDQL EPA Region 5 (1998)	1.38E+00	EDQL EPA Region 5 (1998)

Appendix Table R-2. Derivation of Sediment Ecological Screening Values for Load Line 4, Ravenna, Ohio

Analyte	CAS Registry Number	Sediment Screening Values					
		Consensus-Based Sediment Quality Guidelines[a]		Ecological Data Quality Levels (EDQL)[b]		Preferred Ecological Screening Value (ESV)[c]	
		Number	Source	Number	Source	Number	Source
Hexachlorocyclopentadiene	77-47-4			0.90074	EDQL EPA Region 5 (1998)	9.01E-01	EDQL EPA Region 5 (1998)
Hexachloroethane	67-72-1			2.23	EDQL EPA Region 5 (1998)	2.23E+00	EDQL EPA Region 5 (1998)
2-Hexanone	591-78-6			1.01	EDQL EPA Region 5 (1998)	1.01E+00	EDQL EPA Region 5 (1998)
HMX Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	2691-41-0	2691-41-0				No ESV	No Source
Indeno(1,2,3-cd)pyrene	193-39-5			0.2	EDQL EPA Region 5 (1998)	2.00E-01	EDQL EPA Region 5 (1998)
Isophorone	78-59-1			0.4223	EDQL EPA Region 5 (1998)	4.22E-01	EDQL EPA Region 5 (1998)
Malathion	121-75-5					No ESV	No Source
Methoxychlor	72-43-5			0.00359	EDQL EPA Region 5 (1998)	3.59E-03	EDQL EPA Region 5 (1998)
Methylene chloride	75-09-2			1.26	EDQL EPA Region 5 (1998)	1.26E+00	EDQL EPA Region 5 (1998)
2-Methylnaphthalene	91-57-6			0.0202	EDQL EPA Region 5 (1998)	2.02E-02	EDQL EPA Region 5 (1998)
2-Methylphenol	95-48-7			0.000826	EDQL EPA Region 5 (1998)	8.26E-04	EDQL EPA Region 5 (1998)
4-Methylphenol	106-44-5			0.000808	EDQL EPA Region 5 (1998)	8.08E-04	EDQL EPA Region 5 (1998)
4-Methyl-2-pentanone	108-10-1			0.54437	EDQL EPA Region 5 (1998)	5.44E-01	EDQL EPA Region 5 (1998)
Mirex	2385-85-5					No ESV	No Source
Naphthalene	91-20-3	0.176	MacDonald et al. (2000)	0.0346	EDQL EPA Region 5 (1998)	1.76E-01	MacDonald et al. (2000)
2-Nitroaniline	88-74-4			0.000222	EDQL EPA Region 5 (1998)	2.22E-04	EDQL EPA Region 5 (1998)
3-Nitroaniline	99-09-2			0.000222	EDQL EPA Region 5 (1998)	2.22E-04	EDQL EPA Region 5 (1998)
4-Nitroaniline	100-01-6			0.000222	EDQL EPA Region 5 (1998)	2.22E-04	EDQL EPA Region 5 (1998)
2-Nitrobenzenamine	88-74-4			0.000222	EDQL EPA Region 5 (1998)	2.22E-04	EDQL EPA Region 5 (1998)
3-Nitrobenzenamine	99-09-2			0.000222	EDQL EPA Region 5 (1998)	2.22E-04	EDQL EPA Region 5 (1998)
Nitrobenzene	99-95-3			0.4876	EDQL EPA Region 5 (1998)	4.88E-01	EDQL EPA Region 5 (1998)
4-Nitrobenzenamine	100-01-6			0.000222	EDQL EPA Region 5 (1998)	2.22E-04	EDQL EPA Region 5 (1998)
Nitrocellulose	9004-70-0					No ESV	No Source
Nitroglycerin	55-63-0					No ESV	No Source
Nitroquanidine	210880-92-5					No ESV	No Source

Appendix Table R-2. Derivation of Sediment Ecological Screening Values for Load Line 4, Ravenna, Ohio

Analyte	CAS Registry Number	Sediment Screening Values					
		Consensus-Based Sediment Quality Guidelines[a]		Ecological Data Quality Levels (EDQL)[b]		Preferred Ecological Screening Value (ESV)[c]	
		Number	Source	Number	Source	Number	Source
2-Nitrophenol	88-75-5			0.00777	EDQL EPA Region 5 (1998)	7.77E-03	EDQL EPA Region 5 (1998)
4-Nitrophenol	100-02-7			0.00778	EDQL EPA Region 5 (1998)	7.78E-03	EDQL EPA Region 5 (1998)
m-Nitrotoluene	99-08-1					No ESV	No Source
N-nitroso-di-n-dipropylamine	621-64-7			0.000217	EDQL EPA Region 5 (1998)	2.17E-04	EDQL EPA Region 5 (1998)
N-nitrosodiphenylamine	86-30-6			0.15524	EDQL EPA Region 5 (1998)	1.55E-01	EDQL EPA Region 5 (1998)
N-Nitroso-di-n-propylamine	621-64-7					No ESV	No Source
o-Nitrotoluene	88-72-2					No ESV	No Source
2,2'- oxybis(1-Chloropropane)	108-60-1			0.06878	EDQL EPA Region 5 (1998)	6.88E-02	EDQL EPA Region 5 (1998)
Pentachlorophenol	87-86-5			30.1	EDQL EPA Region 5 (1998)	3.01E+01	EDQL EPA Region 5 (1998)
Pentachlorobenzene	608-93-5			1.26	EDQL EPA Region 5 (1998)	1.26E+00	EDQL EPA Region 5 (1998)
Phenanthrene	85-01-8	0.204	MacDonald et al. (2000)	0.0419	EDQL EPA Region 5 (1998)	2.04E-01	MacDonald et al. (2000)
Phenol	108-95-2			0.02726	EDQL EPA Region 5 (1998)	2.73E-02	EDQL EPA Region 5 (1998)
Polynuclear aromatic hydrocarbons	130498-29-2					No ESV	No Source
Polychorinated biphenyls	1336-36-3			0.0341	EDQL EPA Region 5 (1998)	3.41E-02	EDQL EPA Region 5 (1998)
p-Nitrotoluene	99-99-0					No ESV	No Source
Pyrene	129-00-0	0.195	MacDonald et al. (2000)	0.053	EDQL EPA Region 5 (1998)	1.95E-01	MacDonald et al. (2000)
RDX (cyclonite) Hexahydro-1,3,5-trinitro-1,3,5-triazine	121-82-4					No ESV	No Source
Styrene	100-42-5			0.44496	EDQL EPA Region 5 (1998)	4.45E-01	EDQL EPA Region 5 (1998)
Tetrachloroethene	127-18-4			0.19583	EDQL EPA Region 5 (1998)	1.96E-01	EDQL EPA Region 5 (1998)
Tetrachloroethylene	127-18-4			0.19583	EDQL EPA Region 5 (1998)	1.96E-01	EDQL EPA Region 5 (1998)
1,1,2,2-Tetrachloroethane	79-34-5			0.02908	EDQL EPA Region 5 (1998)	2.91E-02	EDQL EPA Region 5 (1998)
Tetrachloromethane	56-23-5			0.03573	EDQL EPA Region 5 (1998)	3.57E-02	EDQL EPA Region 5 (1998)
Tetryl	479-45-8					No ESV	No Source
Toluene	108-88-3			52.5	EDQL EPA Region 5 (1998)	5.25E+01	EDQL EPA Region 5 (1998)
Toxaphene	8001-35-2			0.000109	EDQL EPA Region 5 (1998)	1.09E-04	EDQL EPA Region 5 (1998)

Appendix Table R-2. Derivation of Sediment Ecological Screening Values for Load Line 4, Ravenna, Ohio

Analyte	CAS Registry Number	Sediment Screening Values					
		Consensus-Based Sediment Quality Guidelines[a]		Ecological Data Quality Levels (EDQL)[b]		Preferred Ecological Screening Value (ESV)[c]	
		Number	Source	Number	Source	Number	Source
Tribromomethane	75-25-2			0.99627	EDQL EPA Region 5 (1998)	9.96E-01	EDQL EPA Region 5 (1998)
Trichloroethene	79-01-6			0.17956	EDQL EPA Region 5 (1998)	1.80E-01	EDQL EPA Region 5 (1998)
1,2,4-Trichlorobenzene	120-82-1			11.7	EDQL EPA Region 5 (1998)	1.17E+01	EDQL EPA Region 5 (1998)
1,1,1-Trichloroethane	71-55-6			0.24685	EDQL EPA Region 5 (1998)	2.47E-01	EDQL EPA Region 5 (1998)
1,1,2-Trichloroethane	79-00-5			0.67351	EDQL EPA Region 5 (1998)	6.74E-01	EDQL EPA Region 5 (1998)
Trichloroethylene	79-01-6			0.17956	EDQL EPA Region 5 (1998)	1.80E-01	EDQL EPA Region 5 (1998)
2,4,5-Trichlorophenol	95-95-4			0.08556	EDQL EPA Region 5 (1998)	8.56E-02	EDQL EPA Region 5 (1998)
2,4,6-Trichlorophenol	88-06-2			0.08484	EDQL EPA Region 5 (1998)	8.48E-02	EDQL EPA Region 5 (1998)
1,3,5-Trinitrobenzene	99-35-4			0.000121	EDQL EPA Region 5 (1998)	1.21E-04	EDQL EPA Region 5 (1998)
2,4,6-Trinitrotoluene	118-96-7					No ESV	No Source
Vinyl chloride	75-01-4			0.002	EDQL EPA Region 5 (1998)	2.00E-03	EDQL EPA Region 5 (1998)
Xylenes (total)	1330-20-7			1.88	EDQL EPA Region 5 (1998)	1.88E+00	EDQL EPA Region 5 (1998)

[a]D.D. MacDonald, C.G. Ingersoll, T.A. Berger. 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems. Arch. Environ. Contam. Toxicol. 39, 20-31

[b]EPA. 1998d. RCRA QAPP Instructions, USEPA Region 5, Chicago, IL, April 1998 revision. Http://www.epa.gov/reg5rcra/wptdiv/cars/cars.htm

[c]The Prefered Soil Value is MacDonald et al. (2000) value (first choice if it is available), else the EDQL.

Appendix Table R-3. Derivation of Surface Water Ecological Screening Values For Load Line 4, Ravenna, Ohio

Chemicals	CAS Registry Number	Surface Water Ecological Screening Values									
		Ohio EPA OMZA (Outside Mixing Zone Average)[a]		National Recommended Water Quality Criteria		Suter and Tsao 1996[b]		Ecological Data Quality Levels (EDQL)[c]		Prefered Surface Water Value[d]	
		Number (ug/L)	Source	Number (ug/L)	Source	Number (ug/L)	Source	Number (ug/L)	Source	Number (ug/L)	Source
Metals (Target Analyte List)											
Aluminum	7429-90-5	--	--	87	NAWQC (2002)	--	--	--	--	8.70E+01	NAWQC (2002)
Antimony	7440-36-0	190	Ohio Administrative Code	--	--	30	draft FCV values (EPA 1988b in Suter & Tsao 1996)	31	EDQL EPA Region 5 (1998)	1.90E+02	Ohio Administrative Code
Arsenic	7440-38-2	150	Ohio Administrative Code	--	--	190	--	53	EDQL EPA Region 5 (1998)	1.50E+02	Ohio Administrative Code
Arsenic III (Diss)	7440-38-2	150	Ohio Administrative Code	--	--	190	--	53	EDQL EPA Region 5 (1998)	1.50E+02	Ohio Administrative Code
Arsenic (TR)	7440-38-2	150	Ohio Administrative Code	--	--	--	--	53	EDQL EPA Region 5 (1998)	1.50E+02	Ohio Administrative Code
Arsenic V (Diss)	7440-38-2	--	--	--	--	3.1	Tier II (Suter & Tsao 1996)	53	EDQL EPA Region 5 (1998)	3.10E+00	Tier II (Suter & Tsao 1996)
Barium	7440-39-3	220	Ohio Administrative Code	--	--	4.0	Tier II (Suter & Tsao 1996)	5000	EDQL EPA Region 5 (1998)	2.20E+02	Ohio Administrative Code
Cadmium	7440-43-9	2.2	Ohio Administrative Code[e]	--	--	1.1	--	0.7	EDQL EPA Region 5 (1998)	2.20E+00	Ohio Administrative Code
Cadmium (Diss)	7440-43-9	2.2	Ohio Administrative Code[e]	--	--	1.1	--	0.7	EDQL EPA Region 5 (1998)	2.20E+00	Ohio Administrative Code
Cadmium (TR)	7440-43-9	2.5	Ohio Administrative Code[e]	--	--	--	--	0.7	EDQL EPA Region 5 (1998)	2.50E+00	Ohio Administrative Code
Calcium	7440-70-2	--	--	--	--	--	--	--	--	No TRV	No Source
Chromium	7440-47-3	86	Ohio Administrative Code	--	--	--	--	42	EDQL EPA Region 5 (1998)	8.60E+01	Ohio Administrative Code
Chromium (diss)	7440-47-3	74	Ohio Administrative Code[e]	--	--	--	--	--	--	7.40E+01	Ohio Administrative Code
Cobalt	7440-48-4	24	Ohio Administrative Code	--	--	23	Tier II (Suter & Tsao 1996)	5	EDQL EPA Region 5 (1998)	2.40E+01	Ohio Administrative Code
Copper	7440-50-8	9.3	Ohio Administrative Code[e]	--	--	--	--	5	EDQL EPA Region 5 (1998)	9.30E+00	Ohio Administrative Code
Copper (Diss)	7440-50-8	9	Ohio Administrative Code[e]	--	--	11		5	EDQL EPA Region 5 (1998)	9.00E+00	Ohio Administrative Code
Copper (TR)	7440-50-8	9.3	Ohio Administrative Code[e]	--	--	--	--	5	EDQL EPA Region 5 (1998)	9.30E+00	Ohio Administrative Code
Iron	7439-89-6	--	--	1000	NAWQC (2002)	--	--	--	--	1.00E+03	NAWQC (2002)
Lead (Diss)	7439-92-1	97	Ohio Administrative Code[e]	--	--	3.2	--	1.3	EDQL EPA Region 5 (1998)	9.70E+01	Ohio Administrative Code
Lead	7439-92-1	120	Ohio Administrative Code[e]	--	--	--	--	1.3	EDQL EPA Region 5 (1998)	1.20E+02	Ohio Administrative Code
Magnesium	7439-95-4	--	--	--	--	--	--	--	--	No TRV	No Source
Manganese	7439-96-5	1600	Ohio Administrative Code	--	--	120	Tier II (Suter & Tsao 1996)	--	--	1.60E+03	Ohio Administrative Code
Mercury	7439-97-6	0.91	Ohio Administrative Code	--	--	--	--	0.0013	EDQL EPA Region 5 (1998)	9.10E-01	Ohio Administrative Code
Mercury (CVAA) (Diss)	7439-97-6	0.77	Ohio Administrative Code	--	--	1.3	Tier II (Suter & Tsao 1996)	0.0013	EDQL EPA Region 5 (1998)	7.70E-01	Ohio Administrative Code
Mercury (TR)	7439-97-6	0.91	Ohio Administrative Code	--	--	--	--	0.0013	EDQL EPA Region 5 (1998)	9.10E-01	Ohio Administrative Code
Nickel	7440-02-0	52	Ohio Administrative Code[e]	--	--	160	--	29	EDQL EPA Region 5 (1998)	5.20E+01	Ohio Administrative Code
Nickel (Diss)	7440-02-0	52	Ohio Administrative Code[e]	--	--	160	--	29	EDQL EPA Region 5 (1998)	5.20E+01	Ohio Administrative Code
Nickel (TR)	7440-02-1	52	Ohio Administrative Code[e]	--	--	--	--	29	EDQL EPA Region 5 (1998)	5.20E+01	Ohio Administrative Code
Potassium	7440-09-7	--	--	--	--	--	--	--	--	No TRV	No Source
Selenium (Diss)	7782-49-2	--	--	5	NAWQC (2002)	--	--	5	EDQL EPA Region 5 (1998)	5.00E+00	NAWQC (2002)
Selenium	7782-49-2	--	--	--	--	--	--	5	EDQL EPA Region 5 (1998)	5.00E+00	EDQL EPA Region 5 (1998)
Sodium	7440-23-5	--	--	--	--	--	--	--	--	No TRV	No Source
Vanadium	7440-62-2	44	Ohio Administrative Code	--	--	20	Tier II (Suter & Tsao 1996)	19	EDQL EPA Region 5 (1998)	4.40E+01	Ohio Administrative Code
Zinc	7440-66-6	120	Ohio Administrative Code[e]	--	--	110	--	59	EDQL EPA Region 5 (1998)	1.20E+02	Ohio Administrative Code
Zinc (Diss)	7440-66-6	120	Ohio Administrative Code[e]	--	--	110	--	59	EDQL EPA Region 5 (1998)	1.20E+02	Ohio Administrative Code
Zinc (TR)	7440-66-6	120	Ohio Administrative Code[e]	--	--	--	--	59	EDQL EPA Region 5 (1998)	1.20E+02	Ohio Administrative Code
Volatile Organic Compounds (VOCs)											
Acetone	67-64-1	--	--	--	--	1500	Tier II (Suter & Tsao 1996)	78000	EDQL EPA Region 5 (1998)	1.50E+03	Tier II (Suter & Tsao 1996)
bis(2-Ethylhexyl)phthalate	117-81-7	8.4	Ohio Administrative Code	--	--	3.0	Tier II (Suter & Tsao 1996)	2.1	EDQL EPA Region 5 (1998)	8.40E+00	Ohio Administrative Code
2-Butanone	78-93-3	22000	Ohio Administrative Code	--	--	14000	Tier II (Suter & Tsao 1996)	7100	EDQL EPA Region 5 (1998)	2.20E+04	Ohio Administrative Code
Carbon disulfide	75-15-0	15	Ohio Administrative Code	--	--	0.92	Tier II (Suter & Tsao 1996)	84	EDQL EPA Region 5 (1998)	1.50E+01	Ohio Administrative Code

Appendix Table R-3. Derivation of Surface Water Ecological Screening Values For Load Line 4, Ravenna, Ohio

Chemicals	CAS Registry Number	Surface Water Ecological Screening Values									
		Ohio EPA OMZA (Outside Mixing Zone Average)[a]		National Recommended Water Quality Criteria		Suter and Tsao 1996[b]		Ecological Data Quality Levels (EDQL)[c]		Prefered Surface Water Value[d]	
		Number (ug/L)	Source	Number (ug/L)	Source	Number (ug/L)	Source	Number (ug/L)	Source	Number (ug/L)	Source
Chrysene	218-01-9	--	--	--	--	--	--	0.033	EDQL EPA Region 5 (1998)	3.30E-02	EDQL EPA Region 5 (1998)
2-Amino-4,6-dinitrotoluene	35572-78-2	18	Ohio Administrative Code	--	--	--	--	--	--	1.80E+01	Ohio Administrative Code
4-Amino-2,6-dinitrotoluene	19406-51-0	11	Ohio Administrative Code	--	--	--	--	--	--	1.10E+01	Ohio Administrative Code
4,4'-DDT	50-29-3	--	--	--	--	0.013	Tier II (Suter & Tsao 1996)	0.001	EDQL EPA Region 5 (1998)	1.30E-02	Tier II (Suter & Tsao 1996)
1,3-Dinitrobenzene	99-65-0	--	--	--	--	--	--	2.36	EDQL EPA Region 5 (1998)	2.36E+00	EDQL EPA Region 5 (1998)
2,4-Dinitrotoluene	121-14-2	390	Ohio Administrative Code	--	--	--	--	230	EDQL EPA Region 5 (1998)	3.90E+02	Ohio Administrative Code
2,6-Dinitrotoluene	606-20-2	730	Ohio Administrative Code	--	--	--	--	42	EDQL EPA Region 5 (1998)	7.30E+02	Ohio Administrative Code
Fluoranthene	206-44-0	2.3	Ohio Administrative Code	--	--	6.16	--	8.1	EDQL EPA Region 5 (1998)	2.30E+00	Ohio Administrative Code
2-Nitrotoluene	88-72-2	71	Ohio Administrative Code	--	--	--	--	--	--	7.10E+01	Ohio Administrative Code
3-Nitrotoluene	99-08-1	42	Ohio Administrative Code	--	--	--	--	--	--	4.20E+01	Ohio Administrative Code
4-Nitrotoluene	99-99-0	46	Ohio Administrative Code	--	--	--	--	--	--	4.60E+01	Ohio Administrative Code
2,4,6-Trinitrotoluene	118-96-7	13	Ohio Administrative Code	--	--	--	--	--	--	1.30E+01	Ohio Administrative Code
HMX	2691-41-0	220	Ohio Administrative Code	--	--	--	--	--	--	2.20E+02	Ohio Administrative Code
Pyrene	129-00-0	42	Ohio Administrative Code	--	--	--	--	0.3	EDQL EPA Region 5 (1998)	4.20E+01	Ohio Administrative Code
RDX	121-82-4	79	Ohio Administrative Code	--	--	--	--	--	--	7.90E+01	Ohio Administrative Code
Tetryl	479-45-8	--	--	--	--	--	--	--	--	No TRV	No Source

[a] Ohio EPA, Division of Surface Water. 1999. Ohio Administrative Code, Chapters 3745-1, 3745-2, May 11

[b] Suter, G. W. and C.L. Tsao, Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision, ES/ER/TM-96/R2 Lockheed Martin Energy Systems, Oak Ridge National Laboratory

[c] EPA. 1998. RCRA QAPP Instructions, USEPA Region 5, Chicago, IL, April 1998 revision. Http://www.epa.gov/reg5rcra/wptdiv/cars/cars.htm

[d] The Prefered Surface Water Value is selected per the following hierachy: Ohio Administrative Code; if OAC value not available, NAWQC, Tier II value; else, EDQL.

[e] Hardness adjusted to 100 mg/L CaCO3

-- = no value

Appendix Table R-4. Bioaccumulation Factors and Log Octanol-Water Partition Coefficients (K_{ow}s) For Analytes at Load Line 4, Ravenna, Ohio

Chemical	CAS Registry Number	Log K_{ow} [a] (L/kg)	Source	BAF MAX	Source
Aluminum		NA	NA	0.075	HAZWRAP (1994)
Ammonia		NA	NA	1	default value
Antimony		NA	NA	0.05	HAZWRAP (1994)
Arsenic		NA	NA	0.1	HAZWRAP (1994)
Barium		NA	NA	0.0075	HAZWRAP (1994)
Beryllium		NA	NA	0.05	HAZWRAP (1994)
Boron		NA	NA	1	default value
Cadmium		NA	NA	11	HAZWRAP (1994)
Calcium		NA	NA	1	default value
Chloride		NA	NA	1	default value
Chromium		NA	NA	0.28	HAZWRAP (1994)
Chromium, hexavalent		NA	NA	0.28	HAZWRAP (1994)
Cobalt		NA	NA	1	HAZWRAP (1994)
Copper		NA	NA	0.5	HAZWRAP (1994)
Cyanide		NA	NA	0	HAZWRAP (1994)
Fluoride		NA	NA	1	default value
Iron		NA	NA	1	default value
Lead		NA	NA	2	HAZWRAP (1994)
Magnesium		NA	NA	1	default value
Manganese		NA	NA	0.02	HAZWRAP (1994)
Mercury		NA	NA	13	HAZWRAP (1994)
Molybdenum		NA	NA	1	default value
Nickel		NA	NA	0.3	HAZWRAP (1994)
Nitrate		NA	NA	1	default value
Phosphorus		NA	NA	1	default value

Appendix Table R-4. Bioaccumulation Factors and Log Octanol-Water Partition Coefficients (K_{ow}s) For Analytes at Load Line 4, Ravenna, Ohio

Chemical	CAS Registry Number	Log K_{ow} [a] (L/kg)	Source	BAF MAX	Source
Potassium		NA	NA	1	default value
Selenium		NA	NA	0.76	HAZWRAP (1994)
Silicon		NA	NA	1	default value
Silver		NA	NA	0.15	HAZWRAP (1994)
Sodium		NA	NA	1	default value
Thallium		NA	NA	1	default value
Vanadium		NA	NA	0.13	HAZWRAP (1994)
Zinc		NA	NA	5	HAZWRAP (1994)
1,1,1-Trichloroethane	71-55-6	2.48	EPA 1995a in Jones, et al 1996	NA	NA
1,1,2,2-Tetrachloroethane	79-34-5	2.39	EPA 1995a in Jones, et al 1996	NA	NA
1,1,2,2-Tetrachloroethylene	127-18-4	2.67	EPA 1995e in Sample, et al 1996	NA	NA
1,1,2-Trichloroethane	79-00-5	2.17	EPA 1995	NA	NA
1,1'-Biphenyl	92-52-4	4.09	Schwarzenbach, et al 1993	NA	NA
1,1-Dichloroethane	75-34-3	4.00	EPA 1995a in Jones, et al 1996	NA	NA
1,1-Dichloroethene	75-35-4	2.13	EPA 1995a in Jones, et al 1996	NA	NA
1,1-Dichloroethylene	75-35-4	5.00	EPA 1995e in Sample, et al 1996	NA	NA
1,2,2-Trichloro-1,1,2-trifluoroe	76-13-1	3.16	Hansch and Leo 1985 in Syracuse 1996	NA	NA
1,2,3,4-Tetrachlorobenzene	634-66-2	4.55	Swarzenbch, et al 1993	NA	NA
1,2,3-Trichlorobenzene	87-61-6	4.05	Sangster 1994 in Syracuse 1996	NA	NA
1,2,3-Trichloropropane	96-18-4	1.98	Russom, et al 1996	NA	NA
1,2,4,5-Tetrachlorobenzene	95-94-3	4.64	Hansch and Leo 1985 in Syracuse 1996	NA	NA
1,2,4-Trichlorobenzene	120-82-1	4.02	EPA 1995d	NA	NA
1,2,4-Trimethyl benzene	95-63-6	3.63	Hansch, et al 1995 in Syracuse 1996	NA	NA
1,2-Dibromo-3-Chloropropane	96-12-8	2.96	Chem Inspect Test Inst. 1992 in Syracuse 1996	NA	NA
Indeno(1,2,3-cd)pyrene	193-39-5	6.92	EPA (1994b)	NA	NA
1,2-Dichloro-1,1,2,2-tetrafluor	76-14-2	2.82	Hansch and Leo 1985 in Syracuse 1996	NA	NA

Appendix Table R-4. Bioaccumulation Factors and Log Octanol-Water Partition Coefficients (K_{ow}s) For Analytes at Load Line 4, Ravenna, Ohio

Chemical	CAS Registry Number	Log K_{ow}[a] (L/kg)	Source	BAF MAX	Source
1,2-Dichlorobenzene	95-50-1	3.38	EPA 1995d	NA	NA
1,2-Dichloroethane	107-06-2	1.47	EPA 1995a in Jones, et al 1996	NA	NA
1,2-Dichloroethene	540-59-0	1.86	EPA 1995a in Jones, et al 1996	NA	NA
1,2-Dichloroethylene	540-59-0	1.86	EPA 1995e in Sample, et al 1996	NA	NA
1,2-Dimethylbenzene	95-47-6	3.12	Schwarzenbach, et al 1993	NA	NA
1,2-Diphenylhydrazine	122-66-7	2.94	Hansch and Leo 1985 in Syracuse 1996	NA	NA
1,3,5-Trinitrobenzene	99-35-4	1.18	Hansch and Leo 1985 in Syracuse 1996	NA	NA
1,3-Butadiene	106-99-0	1.99	Hansch and Leo 1985 in Syracuse 1996	NA	NA
1,3-Dichlorobenzene	541-73-1	3.43	EPA 1995a in Jones, et al 1996	NA	NA
1,3-Dichloropropene	542-75-6	2.00	EPA 1995a in Jones, et al 1996	NA	NA
1,3-Dinitrobenzene	99-65-0	1.49	Hansch and Leo 1985 in Syracuse 1996	NA	NA
1,4-Dichlorobenzene	95-50-1	3.42	EPA 1995a in Jones, et al 1996	NA	NA
1,4-Dinitrobenzene	100-25-4	1.46	Hansch and Leo 1985 in Syracuse 1996	NA	NA
1,4-Dioxane	123-91-1	-0.39	EPA 1995e in Sample, et al 1996	NA	NA
1,4-Naphthoquinone	130-15-4	1.71	Hansch, et al 1995 in Syracuse 1996	NA	NA
1-12'-Dimethybenz(a)anthracene	57-97-6	5.80	Hansch and Leo 1985 in Syracuse 1996	NA	NA
1-Hexanol	111-27-3	2.03	Schwarzenbach, et al 1993	NA	NA
1-Methylnapthalene	90-12-0	3.87	Syracuse 1996 in Jones, et al 1996	NA	NA
1-Nitropropane	108-03-2	0.87	Hansch and Leo 1985 in Syracuse 1996	NA	NA
1-Octanol	111-87-5	2.84	Schwarzenbach, et al 1993	NA	NA
1-Pentanol	71-41-0	1.51	Syracuse 1996 in Jones, et al 1996	NA	NA
2,2'-oxybis(1-chloropropane)	108-60-1	2.48	Kawamoto, K and Urano, K 1989 in Syracuse 1996	NA	NA
2,3,4,5-Tetrachlorophenol	4901-51-3	4.21	Hansch and Leo 1985 in Syracuse 1996	NA	NA
2,3,4,6-Tetrachlorophenol	58-90-2	4.45	Russom, et al 1996[i]	NA	NA
2,3,5,6-Tetrachloroaniline	3481-20-7	4.10	Russom, et al 1996	NA	NA
Nitrocellulose	9004-70-0	--	No Source	NA	NA

Appendix Table R-4. Bioaccumulation Factors and Log Octanol-Water Partition Coefficients (K_{ow}s) For Analytes at Load Line 4, Ravenna, Ohio

Chemical	CAS Registry Number	Log K_{ow}[a] (L/kg)	Source	BAF MAX	Source
2,3,7,8-Tetrachloro-Dibenzodioxin	1746-01-6	6.53	EPA 1995e in Sample, et al 1996[f]	NA	NA
2,4,5-Trichloroaniline	636-30-6	4.01	EPA 1995a in Jones, et al 1996	NA	NA
2,4,5-Trichlorophenoxyacetic acid	93-76-5	3.31	Hansch and Leo 1985 in Syracuse 1996	NA	NA
2,4,6-Trichlorophenol	88-06-2	3.69	Hansch and Leo 1985 in Syracuse 1996	NA	NA
2,4,6-Trinitrotoluene	118-96-7	1.60	Hansch and Leo 1985 in Syracuse 1996	NA	NA
2,4-D	94-75-7	2.81	EPA 1995c[k]	NA	NA
2,4-Dichloroaniline	554-00-7	2.78	Sangster 1994 in Syracuse 1996	NA	NA
2,4-Dichlorophenol	120-83-2	3.06	Russom, et al 1996	NA	NA
2,4-Dimethylphenol	105-67-9	2.35	Swarzenbch, et al 1993	NA	NA
2,4-Dinitrophenol	51-28-5	1.54	Howard 1990	NA	NA
2,4-Dinitrotoluene	121-14-2	1.98	Howard 1990	NA	NA
2,6-Dichlorophenol	87-65-0	2.75	Hansch, et al 1995 in Syracuse 1996	NA	NA
2,6-Dinitrotoluene	606-20-2	1.72	Howard 1990	NA	NA
2-Butanone	79-93-3	0.29	EPA 1995a in Jones et al 1996	NA	NA
2-Chloronaphthalene	91-58-7	3.98	Sangster 1994 in Syracuse 1996	NA	NA
2-Chlorophenol	95-57-8	2.15	Howard 1990.	NA	NA
2-Chloropropane	75-29-6	1.90	Hansch and Leo 1985 in Syracuse 1996	NA	NA
2-Chlorotoluene	95-49-8	3.42	Hansch and Leo 1985 in Syracuse 1996	NA	NA
2-Hexanone	591-78-6	1.38	EPA 1995a in Jones, et al 1996	NA	NA
2-Methylnaphthalene	91-57-6	-1.90	SCDM 1993 in HAZWRAP 1994	NA	NA
2-Methylnapthalene	91-57-6	3.86	Hansch and Leo 1985 in Syracuse 1996	NA	NA
2-Methylphenol	95-48-7	1.99	EPA 1995a in Jones, et al 1996	NA	NA
2-Naphthylamine	91-59-8	2.28	Hansch and Leo 1985 in Syracuse 1996	NA	NA
2-Nitrophenol	88-75-5	1.79	Howard 1990	NA	NA
2-Octanone	111-13-7	2.37	Syracuse 1996 in Jones, et al 1996	NA	NA
2-Picoline	109-06-8	1.11	Russom, et al 1996	NA	NA

Appendix Table R-4. Bioaccumulation Factors and Log Octanol-Water Partition Coefficients (K_{ow}s) For Analytes at Load Line 4, Ravenna, Ohio

Chemical	CAS Registry Number	Log K_{ow}[a] (L/kg)	Source	BAF MAX	Source
2-Propanol	67-63-0	0.05	Hansch and Leo 1985 in Syracuse 1996	NA	NA
2-Propenoic acid	79-10-7	0.35	Hansch, et al 1995 in Syracuse 1996	NA	NA
3,3'-Dichlorobenzidine	91-94-1	3.51	Howard 1990[j]	NA	NA
3,3'-Dimethoxybenzidine	119-90-4	1.81	Debnath, et al 1992 in Syracuse 1996	NA	NA
3,3'-Dimethylbenziding	119-93-7	2.34	Hansch and Leo 1985 in Syracuse 1996	NA	NA
3,4-Dichloroaniline	95-76-1	2.69	Russom, et al 1996	NA	NA
3,4-Dichlorophenol	95-77-2	3.33	Hansch and Leo 1985 in Syracuse 1996	NA	NA
3-Chloroaniline	108-42-9	1.88	Hansch and Leo 1985 in Syracuse 1996	NA	NA
3-Chlorophenol	108-43-0	2.50	Howard 1990.	NA	NA
3-Nitroaniline	99-09-2	1.37	Hansch and Leo 1985 in Syracuse 1996	NA	NA
3-Pentanone	96-22-0	0.99	Hansch and Leo 1985 in Syracuse 1996	NA	NA
4,4-Methylenedianiline	101-77-9	1.59	Hansch and Leo 1985 in Syracuse 1996	NA	NA
4,6-Dinitro-2-methylphenol	534-52-1	2.12	Hansch and Leo 1985 in Syracuse 1996	NA	NA
4-Bromoaniline	106-40-1	2.26	Hansch and Leo 1985 in Syracuse 1996	NA	NA
4-Bromophenyl phenyl-ether	101-55-3	5.00	EPA 1995a in Jones et al 1996	NA	NA
4-Chloro-3-methylphenol	35421-08-0	3.10	Russom, et al 1996	NA	NA
4-chloroaniline	106-47-8	1.83	Howard 1990	NA	NA
4-Chlorophenol	106-48-9	2.39	Howard 1990.	NA	NA
4-Chlorophenyl-phenyl ether	7005-72-3	4.08	Sangster 1994 in Syracuse 1996	NA	NA
4-Chlorotoluene	106-43-4	3.33	Hansch and Leo 1985 in Syracuse 1996	NA	NA
4-Methyl 2-Pentanone	108-10-1	1.31	Syracuse 1996 in Jones, et al 1996	NA	NA
4-Methylphenol	106-44-5	1.90	SCDM 1993 in HAZWRAP 1994	NA	NA
4-Nitroaniline	100-01-6	1.39	Hansch and Leo 1985 in Syracuse 1996	NA	NA
4-Nitrophenol	100-02-7	1.91	Howard 1990	NA	NA
4-Nitroquinoline-1-oxide	56-57-5	1.09	Hansch and Leo 1985 in Syracuse 1996	NA	NA
4-Toluidine	106-49-0	1.39	Russom, et al 1996	NA	NA

Appendix Table R-4. Bioaccumulation Factors and Log Octanol-Water Partition Coefficients (K_{ow}s) For Analytes at Load Line 4, Ravenna, Ohio

Chemical	CAS Registry Number	Log K_{ow}[a] (L/kg)	Source	BAF MAX	Source
5-Nitro-o-Toluidine	99-55-8	1.87	Hansch, et al 1995 in Syracuse 1996	NA	NA
Acenaphthene	83-32-9	3.92	EPA 1995a in Jones, et al 1996	NA	NA
Acenaphthylene	208-96-8	4.10	SCDM 1993 in HAZWRAP 1994	NA	NA
Acetone	67-64-1	-0.24	EPA 1995a in Jones, et al 1996	NA	NA
Acetonitrile	75-05-8	0.25	Howard 1990	NA	NA
Acetonitrile	75-05-8	-0.34	Hansch and Leo 1995 in Syracuse 1996	NA	NA
Acrolein	107-02-8	-0.01	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Acrylamide	79-06-1	-0.67	Howard 1990	NA	NA
Aldicarb	116-06-3	1.13	EPA 1995c	NA	NA
Aldrin	309-00-2	6.50	EPA 1995e in Sample, et al 1996	NA	NA
alpha, alpha-Dimethylphenethylamine	122-09-8	1.90	Hansch and Leo 1985 in Syracuse 1996	NA	NA
alpha-BHC	319-84-6	3.80	SCDM 1993 in HAZWRAP 1994	NA	NA
Aniline	62-53-3	0.90	Howard 1990	NA	NA
Anthracene	120-12-7	4.55	EPA 1995a in Jones, et al 1996	NA	NA
Aroclor 1016	1264-11-2	5.60	ATSDR 1989 in Jones, et al 1996	NA	NA
Aroclor 1221	11104-28-2	4.70	ATSDR 1989 in Jones, et al 1996	NA	NA
Aroclor 1232	11141-16-5	5.10	ATSDR 1989 in Jones, et al 1996	NA	NA
Aroclor 1242	53469-21-9	5.60	ATSDR 1989 in Jones, et al 1996	NA	NA
Aroclor 1248	12672-29-6	6.20	ATSDR 1989 in Jones, et al 1996	NA	NA
PCB-1248	12672-29-6	6.20	ATSDR 1989 in Jones, et al 1996	NA	NA
Aroclor 1254	27323-18-8	6.50	ATSDR 1989 in Jones, et al 1996	NA	NA
Aroclor 1260	11096-82-5	6.80	ATSDR 1989 in Jones, et al 1996	NA	NA
Atrazine	1912-24-9	2.75	EPA 1995c	NA	NA
Azobenzene	103-33-3	3.82	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Benzaldehyde	100-52-7	1.48	Schwarzenbach, et al 1993	NA	NA
Benzene	71-43-2	2.13	EPA 1995a in Jones et al 1996	NA	NA

Appendix Table R-4. Bioaccumulation Factors and Log Octanol-Water Partition Coefficients (K_{ow}s) For Analytes at Load Line 4, Ravenna, Ohio

Chemical	CAS Registry Number	Log K_{ow}[a] (L/kg)	Source	BAF MAX	Source
Benzidine	92-87-5	1.66	EPA 1995a in Jones et al 1996	NA	NA
Benzo(a)anthracene	56-55-3	5.70	EPA 1995a in Jones et al 1996	NA	NA
Benzo(a)pyrene	50-32-8	6.11	EPA 1995a in Jones et al 1996	NA	NA
Benzo(b)fluoranthene	205-99-2	6.10	SCDM 1993 in HAZWRAP 1994	NA	NA
Benzo(e)pyrene	192-97-2	6.44	Devoogt, et al 1990 in Syracuse 1996	NA	NA
Benzo(g,h,i)perylene	191-24-2	6.60	SCDM 1993 in HAZWRAP 1994[e]	NA	NA
Benzo(k)fluoranthene	207-08-9	6.10	SCDM 1993 in HAZWRAP 1994	NA	NA
Benzoic acid	65-85-0	1.87	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Benzyl alcohol	100-51-6	1.11	EPA 1995a in Jones et al 1996	NA	NA
Benzyl chloride	100-44-7	2.30	Hansch and Leo 1985 in Syracuse 1996	NA	NA
beta-BHC	319-85-7	3.81	EPA 1995e in Sample, et al 1996	NA	NA
BHC-mixed isomers	--	5.89	EPA 1995e in Sample, et al 1996	NA	NA
Biphenyl	95-52-4	3.96	EPA 1995b in Jones et al 1996	NA	NA
bis(2-chloroethyl)ether	111-44-4	1.29	Howard 1990	NA	NA
Bis(2-ethylhexyl)phthalate	117-81-7	7.60	Syracuse 1996 in Jones, et al 1996[c]	NA	NA
Bromobenzene	108-86-1	2.99	Schwarzenbach, et al 1993	NA	NA
Bromodichloromethane	75-27-4	1.41	Syracuse 1996 in Jones, et al 1996	NA	NA
Butane	106-97-8	2.89	Schwarzenbach, et al 1993	NA	NA
Butylbenzyl phthalate	85-68-7	4.84	EPA 1995a in Jones, et al 1996	NA	NA
Captan	133-06-2	2.35	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Carbaryl	65-25-2	2.36	Schwarzenbach, et al 1993	NA	NA
Carbazole	86-74-8	3.76	Hansch and Leo 1979 in HAZWRAP 1994	NA	NA
Carbofuran	1563-66-2	2.32	EPA 1995c	NA	NA
Carbon Disulfide	75-15-0	2.00	EPA1995a in Jones, et al 1996	NA	NA
Carbon Tetrachloride	56-23-5	2.73	EPA 1995a in Jones, et al 1996	NA	NA
Chloracetamide	79-07-2	-0.53	Hansch and Leo 1985 in Syracuse 1996	NA	NA

Appendix Table R-4. Bioaccumulation Factors and Log Octanol-Water Partition Coefficients (K_{ow}s) For Analytes at Load Line 4, Ravenna, Ohio

Chemical	CAS Registry Number	Log K_{ow} [a] (L/kg)	Source	BAF MAX	Source
Chlordane	57-74-9	6.32	EPA 1995a in Jones, et al 1996	NA	NA
Chlordecone	143-50-0	5.30	EPA 1995e in Sample, et al 1996	NA	NA
Chlorobenzene	108-90-7	2.86	EPA 1995a in Jones, et al 1996	NA	NA
Chlorobenzilate	510-15-6	4.74	Chem Inspect Test Inst. 1992 in Syracuse 1996	NA	NA
Chlorodifluoromethane	75-45-6	1.08	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Chloroethane	75-00-3	1.43	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Chloroform	67-66-3	1.92	EPA 1995e in Sample, et al 1996	NA	NA
Chloromethane	74-87-3	0.91	Schwarzenbach, et al 1993	NA	NA
Chloropropene	107-05-1	2.03	Howard 1990	NA	NA
Chrysene	218-01-9	5.70	SCDM 1993 in HAZWRAP 1994	NA	NA
Cis-1,3-Dichloropropene	10061-02-6	2.06	Tomlin 1994 in Syracuse 1996	NA	NA
Cumene	98-82-8	3.66	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Cyanogen	460-19-5	0.07	Hansch, et al 1995 in Syracuse 1996	NA	NA
Cyclohexanol	108-93-0	1.23	Schwarzenbach, et al 1993	NA	NA
Cyclohexanone	108-94-1	0.81	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Cyclopentane	287-92-3	3.00	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Dalapon	75-99-0	0.78	EPA 1995c	NA	NA
DDT	50-29-3	6.53	EPA 1995a in Jones, et al 1996	NA	NA
4,4'-DDT	50-29-3	6.53	EPA 1995a in Jones, et al 1996	NA	NA
Decane	124-18-5	5.01	EPA 1995a in Jones, et al 1996	NA	NA
delta-BHC	319-86-8	4.10	SCDM 1993 in HAZWRAP 1994	NA	NA
Diallate	2303-16-4	4.49	Ellington and Stancil 1988 in Syracuse 1996	NA	NA
Diazinon	333-41-5	3.70	EPA 1995a in Jones, et al 1996	NA	NA
Dibenzo(a,h)anthracene	53-70-3	6.50	SCDM 1993 in HAZWRAP 1994	NA	NA
Dibenzofuran	132-64-9	4.12	EPA 1995a in Jones, et al 1996	NA	NA
Dibromochloromethane	124-48-1	2.16	Sangster 1994 in Syracuse 1996	NA	NA

Appendix Table R-4. Bioaccumulation Factors and Log Octanol-Water Partition Coefficients (K_{ow}s) For Analytes at Load Line 4, Ravenna, Ohio

Chemical	CAS Registry Number	Log K_{ow}[a] (L/kg)	Source	BAF MAX	Source
Dibromomethane	74-95-3	1.70	Martiska, A, Bekarek, V 1990 in Syracuse 1996	NA	NA
Dichlorodifluromethane	74-71-8	2.53	Swarzenbch, et al1993	NA	NA
Dieldrin	60-57-1	5.37	EPA 1995a in Jones, et al 1996	NA	NA
Dienochlor	2227-17-0	3.50	British Crop Protection Council 1987 in ARS 1999	NA	NA
Diethyl Sulfide	352-93-2	1.95	Schwarzenbach, et al 1993	NA	NA
Diethylphthalate	84-66-2	2.50	EPA 1995a in Jones, et al 1996	NA	NA
Diisobutylphthalate	84-69-5	4.11	Schwarzenbach, et al 1993	NA	NA
Dimethoate	60-51-5	0.78	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Dimethylphthalate	131-11-3	1.53	Schwarzenbach, et al 1993	NA	NA
Di-n-butylphthalate	84-74-2	4.61	EPA 1995a in Jones, et al 1996	NA	NA
Di-n-octylphthalate	117-84-0	8.10	Ellington and Floyd 1996 in Syracuse 1996	NA	NA
Dinoseb	88-85-7	3.56	Hansch, et al 1995 in Syracuse 1996	NA	NA
Dioxin	1746-01-6	6.80	EPA 1995d[d]	NA	NA
Diphenyl ether	101-84-8	4.21	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Diphenylamine	122-39-4	3.50	Russom, et al 1996	NA	NA
Diquat	85-00-7	-3.05	EPA 1995c	NA	NA
Disulfoton	298-04-4	4.02	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Diuron	330-54-1	2.80	Dupon Cortporation Data 1989 in ARS 1999	NA	NA
Endosulfan	115-29-7	4.10	EPA 1995a in Jones, et al 1996	NA	NA
Endosulfan sulfate	1031-07-8	3.66	Hansch, et al 1995 in Syracuse 1996	NA	NA
Endosulfan, alpha	959-98-8	3.83	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Endrin	72-20-8	5.06	EPA 1995a in Jones, et al 1996	NA	NA
Endrin Aldehyde	7421-93-4	3.14	Arthur D. Little, Inc. 1981 in HAZWRAP 1994	NA	NA
Epichlorohydrin	106-89-8	0.45	Deneer, et al 1988 in Syracuse 1996	NA	NA
Ethane	74-84-0	1.81	Schwarzenbach, et al 1993	NA	NA
Ethanol	64-17-5	-0.31	EPA 1992b in Sample, et al 1996	NA	NA

Appendix Table R-4. Bioaccumulation Factors and Log Octanol-Water Partition Coefficients (K_{ow}s) For Analytes at Load Line 4, Ravenna, Ohio

Chemical	CAS Registry Number	Log K_{ow} [a] (L/kg)	Source	BAF MAX	Source
Ethyl Acetate	141-78-6	0.69	EPA 1995e in Sample, et al 1996	NA	NA
Ethyl benzene	100-41-4	3.14	EPA 1995a in Jones, et al 1996	NA	NA
Ethyl carbamate	51-79-6	-0.15	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Ethyl ether	60-29-7	0.89	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Ethylene Dibromide	106-93-4	1.96	Hansch, et al 1995 in Syracuse 1996	NA	NA
Ethylene glycol	107-21-1	-1.36	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Famphur	52-85-7	2.23	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Fluometuron	2164-17-2	1.34	Schwarzenbch et al 1993	NA	NA
Fluoranthene	206-44-0	5.12	EPA 1995a in Jones, et al 1996	NA	NA
Fluorene	86-73-7	4.21	EPA 1995a in Jones, et al 1996	NA	NA
Fluorobenzene	462-06-6	2.27	Swarzenbch et al 1993	NA	NA
Formaldehyde	50-00-0	-0.05	EPA 1995e in Sample, et al 1996	NA	NA
Formamide	75-12-7	-1.51	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Formic acid	64-18-6	-0.54	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Furan	110-00-9	1.34	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Furfural	98-01-1	0.41	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Heptachlor	76-44-8	6.10	EPA 1995a in Jones, et al 1996	NA	NA
Heptachlor Epoxide	102-57-3	5.40	SCDM 1993 in HAZWRAP 1994	NA	NA
Heptane	142-82-5	4.66	Miller, M.M., et al 1985 in Syracuse 1996	NA	NA
Hexachlorobenzene	118-74-1	5.50	Schwarzenbach, et al 1993	NA	NA
Hexachlorobutadiene	87-68-3	4.90	Schwarzenbach, et al 1993	NA	NA
Hexachlorocyclopentadiene	77-47-4	5.04	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Hexachloroethane	67-72-1	4.00	EPA 1995a in Jones, et al 1996	NA	NA
Hexachlorophene	70-30-4	7.54	Hansch, et al 1995 in Syracuse 1996	NA	NA
Imazaquin-ammonium	81335-47-9	0.34	Pesticide Manual, 1994in ARS 1999	NA	NA
Imazilil	35554-44-0	3.82	British Crop Protection Council 1986 in ARS 1999	NA	NA

Appendix Table R-4. Bioaccumulation Factors and Log Octanol-Water Partition Coefficients (K_{ow}s) For Analytes at Load Line 4, Ravenna, Ohio

Chemical	CAS Registry Number	Log K_{ow} [a] (L/kg)	Source	BAF MAX	Source
Isobutyl alcohol	78-83-1	0.76	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Isophorone	78-59-1	1.70	Veith, G.D., et al 1980 in Syracuse 1996	NA	NA
Lindane (gamma-BHC)	58-89-9	3.73	EPA 1995a in Jones, et al 1996	NA	NA
Malathion	121-75-5	2.89	Schwarzenbach, et al 1993	NA	NA
MCPA	94-74-6	2.80	Pionke, H.B., Deangelis, R.J. 1980 in ARS 1999	NA	NA
m-cresol	108-39-4	1.96	Howard 1990.	NA	NA
Methacrylonitril	126-98-7	0.68	Tanii and Hashimoto 1994 in Syracuse 1996	NA	NA
Methanol	67-56-1	-0.71	EPA 1995e in Sample, et al 1996	NA	NA
Methapyrilene	91-80-5	2.87	Sangster 1994 in Syracuse 1996	NA	NA
Methomyl	16752-77-5	0.57	Dupont Corporation Data 1989 In ARS 1999	NA	NA
Methoxychlor	72-43-5	5.08	EPA 1995a in Jones, et al 1996	NA	NA
Methyl bromide	74-83-9	1.19	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Methyl iodide	74-88-4	3.36	EPA 1995a in Jones, et al 1996	NA	NA
Methyl metharcrylate	80-62-6	1.38	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Methylcyclohexane	108-87-2	3.61	Hansch, et al 1995 in Syracuse 1996	NA	NA
Methylene Chloride	75-09-2	1.25	EPA 1995a in Jones, et al 1996	NA	NA
Methylhydrazine	60-34-4	-1.06	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Methylstyrene	98-83-9	3.48	Hansch, et al 1995 in Syracuse 1996	NA	NA
Mirex	2385-85-5	6.89	Veith, et al 1979 in Syracuse 1996	NA	NA
M-nitrosodiphenylamine	86-30-6	3.13	Hansch and Leo 1985 in Syracuse 1996	NA	NA
m-Nitrotoluene	99-08-1	2.45	Russom, et al 1996	NA	NA
Naphthalene	91-20-3	3.36	EPA 1995a in Jones, et al 1996	NA	NA
n-Butyl benzene	104-51-8	4.38	DeBruijn, J, et al 1989 in Syracuse 1996	NA	NA
n-Hexane	110-54-3	4.11	Schwarzenbach, et al 1993	NA	NA
Nitrobenzene	98-95-3	1.83	Schwarzenbch et al 1993	NA	NA
Nitroglycerin	55-63-0	1.62	Hansch and Leo 1985 in Syracuse 1996	NA	NA

Appendix Table R-4. Bioaccumulation Factors and Log Octanol-Water Partition Coefficients (K_{ow}s) For Analytes at Load Line 4, Ravenna, Ohio

Chemical	CAS Registry Number	Log K_{ow}[a] (L/kg)	Source	BAF MAX	Source
Nitromethane	75-52-5	-0.35	Hansch and Leo 1985 in Syracuse 1996	NA	NA
n-Nitrochlorobenzene	100-00-5	2.39	Hansch and Leo 1985 in Syracuse 1996	NA	NA
N-Nitrosodiethylamine	55-18-5	0.48	Hansch and Leo 1985 in Syracuse 1996	NA	NA
N-Nitrosomorpholine	59-89-2	-0.44	Hansch and Leo 1985 in Syracuse 1996	NA	NA
N-Nitrosopiperidine	100-75-4	0.36	Hansch and Leo 1985 in Syracuse 1996	NA	NA
N-Nitrosopyrrolidine	930-55-2	-0.19	Hansch and Leo 1985 in Syracuse 1996	NA	NA
n-Pentane	109-66-0	3.62	Swarzenbch, et al 1993	NA	NA
n-Pentylbenzene	538-68-1	4.90	Schwarzenbach, et al 1993	NA	NA
n-propyl benzene	103-65-1	3.69	Sangster 1994 in Syracuse 1996	NA	NA
o-Cresol	95-48-7	1.99	EPA 1995e in Sample, et al 1996	NA	NA
Octachloronaphthalene	2234-13-1	8.24	Opperhuizen, A 1985 in Syracuse 1996[b]	NA	NA
o-Dichlorobenzene	95-50-1	3.38	EPA 1995d	NA	NA
o-Dinitrobenzene	528-29-0	1.69	Hansch, et al 1995 in Syracuse 1996	NA	NA
o-Nitroaniline	88-74-4	1.85	Hansch and Leo 1985 in Syracuse 1996	NA	NA
o-Nitrophenol	88-75-5	1.79	Howard 1990	NA	NA
o-Nitrotoluene	88-72-2	2.30	Opperhuizen, A 1985 in Syracuse 1996	NA	NA
Oxadiazon	19666-30-9	4.70	Rhone-Poulenc Corporation Data in ARS 1999	NA	NA
p,p'-DDD	72-54-8	6.10	EPA 1995a in Jones, et al 1996	NA	NA
4,4'-DDD	72-54-8	6.10	EPA 1995a in Jones, et al 1996	NA	NA
4,4'-DDE	72-55-9	6.26	EPA 1994b	NA	NA
Parathion	56-38-2	3.81	Schwarzenbach, et al 1993	NA	NA
p-Cresol	106-44-5	1.94	Hansch and Leo 1985 in Syracuse 1996	NA	NA
p-Dichlorobenzene	106-46-7	3.37	EPA 1995d	NA	NA
Pentachloroaniline	527-20-8	4.82	Sangster 1994 in Syracuse 1996	NA	NA
Pentachlorobenzene	608-93-5	5.26	EPA1995a in Jones, et al 1996	NA	NA
Pentachloroethane	76-01-7	3.63	Russom, et al 1996	NA	NA

Appendix Table R-4. Bioaccumulation Factors and Log Octanol-Water Partition Coefficients (K_{ow}s) For Analytes at Load Line 4, Ravenna, Ohio

Chemical	CAS Registry Number	Log K_{ow} [a] (L/kg)	Source	BAF MAX	Source
Pentachloro-nitrobenzene	82-68-8	4.64	EPA 1995e in Sample, et al 1996	NA	NA
Pentachlorophenol	87-86-5	5.09	EPA 1995e in Sample, et al 1996	NA	NA
Phenacetin	62-44-2	1.58	Nakagawa, Y, et al 1992 in Syracuse 1996	NA	NA
Phenanthrene	85-01-8	4.55	EPA1995a in Jones, et al 1996	NA	NA
Phenmediphan	13684-63-4	3.59	Noram Company Data in ARS 1999	NA	NA
Phenol	108-95-2	1.48	EPA1995a in Jones, et al 1996	NA	NA
Phorate	298-02-2	3.56	Hansch, et al 1995 in Syracuse 1996	NA	NA
Phosmet	732-11-6	3.00	Beguhn, M.A. 1989 in ARS 1989	NA	NA
Phthalic acid	100-21-0	2.00	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Phthalic anhydride	85-44-9	1.60	Panoma 1987 in Syracuse 1996	NA	NA
p-Nitrophenol	100-02-07	1.91	Howard 1990	NA	NA
p-Nitrotoluene	99-99-0	2.37	Howard 1990	NA	NA
p-Phenylenediamine	106-50-3	-0.30	Hansch, et al 1995 in Syracuse 1996	NA	NA
Profenofos	41198-08-7	1.70	Ciba-Geigy Corporation Data 1989 in ARS 1999	NA	NA
Pronamide	23950-58-5	0.05	EPA1995a in Jones, et al 1996	NA	NA
Propionitril	107-12-0	0.16	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Pryidine	110-86-1	0.65	Russom, et al 1996	NA	NA
Pyrene	129-00-0	5.13	Schwarzenbach, et al 1993g	NA	NA
Quinoline	91-22-5	2.03	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Quinone	106-51-4	0.20	Hansch and Leo 1985 in Syracuse 1996	NA	NA
RDX	121-82-4	0.87	Schwarzenbach, et al 1993	NA	NA
sec-Butyl benzene	135-98-8	4.57	Sherblom, et al 1988 in Syracuse 1996	NA	NA
Silvex	93-72-1	3.80	Hansch , et al 1995 in Syracuse 1996	NA	NA
Simazine	122-34-9	2.18	EPA 1995c	NA	NA
Strychnine	57-24-9	1.93	Panoma 1987 in Syracuse 1996	NA	NA
Styrene	100-42-5	2.95	Schwarzenbach, et al 1993	NA	NA

Appendix Table R-4. Bioaccumulation Factors and Log Octanol-Water Partition Coefficients (K_{ow}s) For Analytes at Load Line 4, Ravenna, Ohio

Chemical	CAS Registry Number	Log K_{ow}[a] (L/kg)	Source	BAF MAX	Source
Tebuthiuron	34014-18-1	1.79	ARS 1999	NA	NA
Temephos	3383-96-8	4.90	British Crop Protection Council 1994 in ARS 1999[h]	NA	NA
tert-Butyl benzene	98-06-6	4.11	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Tetrachloroethane	25322-20-7	2.39	Schwarzenbach, et al 1993	NA	NA
Tetrachloroethene	127-18-4	2.88	Schwarzenbach, et al 1993	NA	NA
Tetrachloroethylene	127-18-4	3.40	EPA 1995d	NA	NA
Tetrachloromethane	56-23-5	2.73	EPA 1995a in Jones, et al 1996	NA	NA
Tetrahydrofuran	109-99-9	0.46	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Toluene	108-883	2.75	EPA 1995a in Jones, et al 1996	NA	NA
Toxaphene	8001-35-2	5.50	EPA 1995e in Sample, et al 1996	NA	NA
Trans-1,3-Dichloropropene	10061-02-6	2.03	Tomlin 1994 in Syracuse 1996	NA	NA
Tribromomethane	75-25-2	2.35	EPA 1995a in Jones, et al 1996	NA	NA
Tributyl phosphate	126-73-8	4.00	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Trichloroethene	636-30-6	2.71	EPA 1995a in Jones, et al 1996	NA	NA
Trichloroethylene	79-01-6	2.71	EPA 1995e in Sample, et al 1996	NA	NA
Trichlorofluoromethane	75-69-4	2.16	Schwarzenbach, et al 1993	NA	NA
Triethylamine	121-44-8	1.45	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Trifluorobromomethane	75-63-8	1.86	Hansch and Leo 1985 in Syracuse 1996	NA	NA
Vinyl acetate	108-05-4	0.73	EPA 1995a in Jones, et al 1996	NA	NA
Vinyl Chloride	75-01-4	1.50	EPA 1995e in Sample, et al 1996	NA	NA
Xylene	1330-20-7	3.13	EPA 1995a in Jones, et al 1996	NA	NA
Xylene (mixed isomers)	1330-20-7	3.20	EPA 1995e in Sample, et al 1996	NA	NA
Ziram	137-30-4	1.09	British Crop Protection Council 1994 in ARS 1999	NA	NA

[a] Log Octanol-Water partition coefficient.

Appendix Table R-4. Bioaccumulation Factors and Log Octanol-Water Partition Coefficients (K_{ow}s) For Analytes at Load Line 4, Ravenna, Ohio

Chemical	CAS Registry Number	Log K_{ow} [a] (L/kg)	Source	BAF MAX	Source

-- = no log K_{ow} found

[b] Syracuse 1996. Syracuse Research Corporation, Environmental Sciences Center's on-line experimental Log P database conducted June 7, 1996.

[c] Jones, D.S., R N. Hull, G.W. Suter II. 1996. *Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1996 Revision.* Lockheed Martin Energy Systems, Inc. Oak Ridge, TN 37831.-

[d] EPA. 1995d. National Primary Drinking Water Regulations; Contaminated Specific Fact Sheets Volatile Organic Chemicals, Technical Version. USEPA Office of Water. EPA 811-F-95-004-T.

[e] HAZWRAP (Hazardous Waste Remedial Action Program). 1994. Loring Air Force Base. Ecological Risk Assessment Methodology.

[f] Sample, B.E., D.M. Opresko, G.W. Suter II. 1996. *Toxicological Benchmarks for Wildlife.* Lockheed Martin Energy Systems, Inc. Oak Ridge, Tn. 37381

[g] Schwarzenbach, R.E., P.M. Gschwend, D.M. Imboden. 1993. Environmental Organic Chemistry. John Wiley & Sons, New York.

[h] United States Department of Agriculture, Agricultural Research Service (ARS) 1999. Remote Sensing and Modeling Lab. 10300 Baltimore Ave. Bldg. 007. Beltsville, MD. 20705.

Appendix Table R-4. Bioaccumulation Factors and Log Octanol-Water Partition Coefficients (K_{ow}s) For Analytes at Load Line 4, Ravenna, Ohio

Chemical	CAS Registry Number	Log K_{ow}[a] (L/kg)	Source	BAF MAX	Source

[i] Russon, C.L., S. Bradbury, S. Broderius. 1996. Environmental Toxicology and Chemistry. V. 16. No. 5, pp.948-967. *Predicting Modes of Toxic Action from chemical* Structure: Acute Toxicity in the Fathead Minnow (*pimephales Promelas*).

[j] Howard, Philip, H. 1990. *Handbook of Environmental Fate and Exposure Data for Organic Chemicals VI.* Lewis Publishers, Chelsea, Michigan.

[k] EPA. 1995c. National Primary Drinking Water Regulations; Contaminant Specific Fact Sheets. USEPA Ofice of Water. EPA 811-F-95-004-T.

Appendix Table R-5. LL4 Soil Detected Anayltes

Analysis Type	Analyte	Units	CAS Number	LL4 Mean	LL4 95% UCL of Mean	LL4 Max. Detect	LL4 Dist.	LL1 Mean	LL1 95% UCL of Mean	LL1 Exp. Conc.	LL1 Max. Detect	LL1 Dist.	Is LL4 Mean > LL1 Exp. Conc?	Bkg. Criteria	Is LL4 Max. Det. > Bkg. Criteria?
Explosives Handling Areas Aggregate															
General	Chromium, hexavalent	mg/kg	18540-29-9	1.9E+00		1.9E+00	X	8.2E-01	1.1E+00	1.1E+00		D	Yes		Yes
Metals	Aluminum	mg/kg	7429-90-5	9.8E+03	1.1E+04	3.9E+04	X	9.4E+03	1.0E+04	1.0E+04	4.6E+04	X	No	1.8E+04	Yes
Metals	Antimony	mg/kg	7440-36-0	5.6E-01	6.9E-01	2.2E+00	D	7.0E-01	7.5E-01	7.5E-01	3.0E+00	D	No	9.6E-01	No
Metals	Arsenic	mg/kg	7440-38-2	8.8E+00	9.5E+00	1.8E+01	N	1.0E+01	1.1E+01	1.1E+01	5.6E+01	X	No	1.5E+01	Yes
Metals	Barium	mg/kg	7440-39-3	8.7E+01	1.1E+02	7.5E+02	X	1.1E+02	1.4E+02	1.4E+02	2.0E+03	X	No	8.8E+01	Yes
Metals	Beryllium	mg/kg	7440-41-7	8.9E-01	1.2E+00	5.9E+00	X	4.0E-01	4.6E-01	4.6E-01	2.6E+00	X	Yes	8.8E-01	Yes
Metals	Cadmium	mg/kg	7440-43-9	8.3E-01	1.2E+00	1.3E+01	X	1.4E+00	1.8E+00	1.8E+00	2.7E+01	X	No		Yes
Metals	Calcium	mg/kg	7440-70-2	1.7E+04	2.8E+04	1.8E+05	X	7.4E+03	9.7E+03	9.7E+03	1.2E+05	X	Yes	1.6E+04	Yes
Metals	Chromium	mg/kg	7440-47-3	1.3E+01	1.5E+01	6.8E+01	X	2.0E+01	2.5E+01	2.5E+01	4.0E+02	X	No	1.7E+01	Yes
Metals	Cobalt	mg/kg	7440-48-4	8.7E+00	1.2E+01	7.8E+01	X	8.2E+00	8.9E+00	8.9E+00	4.9E+01	X	No	1.0E+01	Yes
Metals	Copper	mg/kg	7440-50-8	2.1E+01	2.5E+01	1.1E+02	L	6.2E+01	1.1E+02	1.1E+02	3.7E+03	X	No	1.8E+01	Yes
Metals	Cyanide	mg/kg	57-12-5	2.4E-01	3.2E-01	5.1E-01	D	4.6E-01	5.5E-01	5.5E-01	3.8E+00	D	No		Yes
Metals	Iron	mg/kg	7439-89-6	1.9E+04	2.0E+04	3.0E+04	N	2.1E+04	2.3E+04	2.3E+04	1.1E+05	X	No	2.3E+04	Yes
Metals	Lead	mg/kg	7439-92-1	1.4E+02	2.8E+02	5.8E+03	X	2.0E+02	2.8E+02	2.8E+02	7.1E+03	X	No	2.6E+01	Yes
Metals	Magnesium	mg/kg	7439-95-4	4.8E+03	6.8E+03	3.1E+04	X	2.4E+03	2.7E+03	2.7E+03	1.5E+04	X	Yes	3.0E+03	Yes
Metals	Manganese	mg/kg	7439-96-5	7.0E+02	9.6E+02	7.3E+03	X	6.4E+02	7.0E+02	7.0E+02	3.5E+03	X	Yes	1.5E+03	Yes
Metals	Mercury	mg/kg	7487-94-6	3.8E-02	4.8E-02	3.6E-01	D	2.2E-01	3.4E-01	3.4E-01	9.7E+00	X	No	3.6E-02	Yes
Metals	Nickel	mg/kg	7440-02-0	1.6E+01	1.7E+01	3.2E+01	N	1.6E+01	1.8E+01	1.8E+01	1.0E+02	X	No	2.1E+01	Yes
Metals	Potassium	mg/kg	7440-09-7	8.9E+02	1.0E+03	2.3E+03	L	9.3E+02	1.0E+03	1.0E+03	5.7E+03	X	No	9.3E+02	Yes
Metals	Selenium	mg/kg	7782-49-2	9.7E-01	1.2E+00	3.2E+00	L	7.1E-01	7.9E-01	7.9E-01	5.3E+00	X	Yes	1.4E+00	Yes
Metals	Sodium	mg/kg	7440-23-5	3.2E+02	3.7E+02	8.3E+02	D	2.5E+02	2.8E+02	2.8E+02	8.9E+02	D	Yes	1.2E+02	Yes
Metals	Thallium	mg/kg	6533-73-9	9.2E-01	1.5E+00	1.3E+01	X	5.0E-01	5.4E-01	5.4E-01	2.5E+00	X	Yes		Yes
Metals	Vanadium	mg/kg	7440-62-2	1.4E+01	1.5E+01	2.0E+01	N	1.8E+01	1.9E+01	1.9E+01	7.8E+01	X	No	3.1E+01	No
Metals	Zinc	mg/kg	7440-66-6	1.6E+02	2.6E+02	3.7E+03	X	1.6E+02	1.9E+02	1.9E+02	1.7E+03	X	No	6.2E+01	Yes
Organics-Explosives	2,4,6-Trinitrotoluene	mg/kg	118-96-7	2.3E-01	3.2E-01	2.2E+00	D	1.6E+02	3.0E+02	3.0E+02	4.8E+03	X	No		Yes
Organics-Explosives	HMX	mg/kg	2691-41-0	1.0E+00	1.2E+00	3.6E+00	D	8.4E+00	1.6E+01	1.6E+01	2.6E+02	D	No		Yes
Organics-Explosives	RDX	mg/kg	121-82-4	8.0E-01	1.4E+00	1.9E+01	D	4.8E+01	1.0E+02	1.0E+02	2.3E+03	D	No		Yes
Organics-Pesticide/PCB	4,4'-DDD	mg/kg	72-54-8	8.4E-03	1.8E-02	1.0E-01	D	1.9E-02	3.9E-02	3.9E-02		D	No		Yes
Organics-Pesticide/PCB	4,4'-DDE	mg/kg	72-55-9	7.6E-03	1.3E-02	4.9E-02	D	5.1E-01	1.2E+00	1.2E+00	6.7E+00	X	No		Yes
Organics-Pesticide/PCB	4,4'-DDT	mg/kg	50-29-3	3.7E-02	7.3E-02	2.9E-01	D	2.1E-02	4.1E-02	4.1E-02	4.1E-02	D	No		Yes
Organics-Pesticide/PCB	Aldrin	mg/kg	309-00-2	5.5E-03	1.0E-02	4.3E-02	D	1.9E-02	3.9E-02	3.9E-02		D	No		Yes
Organics-Pesticide/PCB	alpha-Chlordane	mg/kg	5103-71-9	7.2E-03	1.2E-02	3.4E-02	D	3.3E-02	7.8E-02	7.8E-02	4.4E-01	D	No		Yes
Organics-Pesticide/PCB	Dieldrin	mg/kg	60-57-1	7.7E-03	1.5E-02	7.0E-02	D	4.3E-02	9.8E-02	9.8E-02	5.5E-01	D	No		Yes
Organics-Pesticide/PCB	Endosulfan II	mg/kg	33213-65-9	5.2E-03	9.1E-03	3.7E-02	D	1.9E-02	3.9E-02	3.9E-02		D	No		Yes
Organics-Pesticide/PCB	Endrin	mg/kg	72-20-8	5.2E-03	7.3E-03	1.8E-02	D	1.9E-02	3.9E-02	3.9E-02		D	No		Yes
Organics-Pesticide/PCB	Endrin aldehyde	mg/kg	7421-93-4	5.6E-02	1.4E-01	8.4E-01	D	3.1E-01	6.4E+00	4.4E+00	4.4E+00	L	No		Yes
Organics-Pesticide/PCB	Endrin ketone	mg/kg	53494-70-5	3.0E-03	4.4E-03	1.1E-02	D	1.9E-02	3.9E-02	1.4E-02	1.4E-02	D	No		Yes
Organics-Pesticide/PCB	gamma-Chlordane	mg/kg	5103-74-2	9.4E-03	1.8E-02	8.3E-02	D	3.5E-01	8.9E-01	8.9E-01	5.3E+00	D	No		Yes
Organics-Pesticide/PCB	Heptachlor	mg/kg	76-44-8	4.1E-02	1.1E-01	6.7E-01	D	3.5E-02	7.2E-02	7.2E-02	3.2E-01	D	No		Yes
Organics-Pesticide/PCB	Heptachlor epoxide	mg/kg	1024-57-3	4.5E-03	9.8E-03	5.2E-02	D	2.0E-02	4.0E-02	3.1E-02	3.1E-02	D	No		Yes
Organics-Pesticide/PCB	Methoxychlor	mg/kg	72-43-5	2.1E-02	4.2E-02	2.1E-01	D	3.8E-02	7.6E-02	1.4E-02	1.4E-02	D	Yes		Yes
Organics-Pesticide/PCB	PCB-1254	mg/kg	11097-69-1	3.4E-01	5.4E-01	3.2E+00	D	7.0E+01	4.0E+03	1.1E+03	1.1E+03	L	No		Yes
Organics-Pesticide/PCB	PCB-1260	mg/kg	11096-82-5	1.5E+00	2.9E+00	2.8E+01	D	2.4E+00	6.3E+00	6.3E+00		D	No		Yes
Organics-Semivolatile	Acenaphthylene	mg/kg	208-96-8	3.0E-01	3.8E-01	5.6E-01	D	3.7E-01	5.5E-01	5.5E-01		D	No		Yes
Organics-Semivolatile	Anthracene	mg/kg	120-12-7	3.5E-01	4.7E-01	1.2E+00	D	3.6E-01	5.4E-01	5.4E-01	5.5E-01	D	No		Yes
Organics-Semivolatile	Benz(a)anthracene	mg/kg	56-55-3	4.5E-01	6.7E-01	2.1E+00	D	4.3E-01	6.4E-01	6.4E-01	1.2E+00	D	No		Yes
Organics-Semivolatile	Benzo(a)pyrene	mg/kg	50-32-8	4.6E-01	7.5E-01	2.7E+00	D	4.1E-01	6.1E-01	6.1E-01	1.0E+00	D	No		Yes
Organics-Semivolatile	Benzo(b)fluoranthene	mg/kg	205-99-2	1.1E+00	5.4E+00	7.2E+00	L	4.4E-01	6.6E-01	6.6E-01	1.4E+00	D	Yes		Yes
Organics-Semivolatile	Benzo(ghi)perylene	mg/kg	191-24-2	6.0E-01	9.8E-01	3.8E+00	D	3.7E-01	5.4E-01	5.4E-01	5.5E-01	D	Yes		Yes
Organics-Semivolatile	Benzo(k)fluoranthene	mg/kg	207-08-9	6.8E-01	1.2E+00	5.0E+00	D	3.7E-01	5.5E-01	5.5E-01	5.8E-01	D	Yes		Yes
Organics-Semivolatile	Bis(2-ethylhexyl)phthalate	mg/kg	117-81-7	1.9E-01	2.4E-01	2.0E-01	D	3.5E-01	5.4E-01	1.1E-01	1.1E-01	D	Yes		Yes
Organics-Semivolatile	Carbazole	mg/kg	86-74-8	2.9E-01	4.2E-01	1.4E+00	D	3.8E-01	5.6E-01	3.8E-01	3.8E-01	D	No		Yes
Organics-Semivolatile	Chrysene	mg/kg	218-01-9	8.4E-01	2.5E+00	6.4E+00	L	4.3E-01	6.3E-01	6.3E-01	1.1E+00	D	Yes		Yes
Organics-Semivolatile	Di-n-butyl phthalate	mg/kg	84-74-2	3.0E-01	4.0E-01	9.2E-01	D	3.7E-01	5.5E-01	5.5E-01		D	No		Yes
Organics-Semivolatile	Dibenz(a,h)anthracene	mg/kg	53-70-3	2.6E-01	3.6E-01	1.2E+00	D	3.7E-01	5.5E-01	9.6E-02	9.6E-02	D	Yes		Yes
Organics-Semivolatile	Fluoranthene	mg/kg	206-44-0	8.2E-01	3.1E+00	8.1E+00	L	5.5E-01	9.1E-01	9.1E-01	2.9E+00	D	No		Yes

Appendix Table R-5. LL4 Soil Detected Anayltes

Analysis Type	Analyte	Units	CAS Number	LL4 Mean	LL4 95% UCL of Mean	LL4 Max. Detect	LL4 Dist.	LL1 Mean	LL1 95% UCL of Mean	LL1 Exp. Conc.	LL1 Max. Detect	LL1 Dist.	Is LL4 Mean > LL1 Exp. Conc?	Bkg. Criteria	Is LL4 Max. Det. > Bkg. Criteria?
Organics-Semivolatile	Fluorene	mg/kg	86-73-7	2.2E-01	2.7E-01	1.2E-01	D	3.8E-01	5.6E-01	3.1E-01	3.1E-01	D	No		Yes
Organics-Semivolatile	Indeno(1,2,3-cd)pyrene	mg/kg	193-39-5	5.6E-01	9.2E-01	3.7E+00	D	3.7E-01	5.5E-01	5.5E-01	6.2E-01	D	Yes		Yes
Organics-Semivolatile	Naphthalene	mg/kg	91-20-3	2.7E-01	3.3E-01	5.8E-02	D	3.7E-01	5.6E-01	2.2E-01	2.2E-01	D	Yes		Yes
Organics-Semivolatile	Phenanthrene	mg/kg	85-01-8	4.2E-01	6.1E-01	2.3E+00	D	4.9E-01	7.7E-01	7.7E-01	2.5E+00	D	No		Yes
Organics-Semivolatile	Pyrene	mg/kg	129-00-0	6.8E-01	3.0E+00	5.4E+00	L	5.4E-01	8.3E-01	8.3E-01	2.3E+00	D	No		Yes
Organics-Volatile	Acetone	mg/kg	67-64-1	1.2E-02	1.8E-02	5.0E-02	D	7.0E-03	8.1E-03	8.1E-03	1.1E-02	D	Yes		Yes
Organics-Volatile	Chloroform	mg/kg	67-66-3	3.1E-03	3.9E-03	2.0E-03	D	3.1E-03	3.4E-03	3.4E-03		D	No		Yes
Organics-Volatile	Toluene	mg/kg	108-88-3	2.7E-03	3.8E-03	1.2E-02	D	3.1E-03	3.4E-03	3.4E-03		D	No		Yes
Preparation and Receiving Areas Aggregate															
Metals	Aluminum	mg/kg	7429-90-5	9.0E+03	1.1E+04	1.6E+04	N	9.8E+03	1.2E+04	1.2E+04	2.3E+04	L	No	1.8E+04	No
Metals	Arsenic	mg/kg	7440-38-2	1.0E+01	1.4E+01	2.7E+01	L	1.2E+01	1.3E+01	1.3E+01	1.9E+01	N	No	1.5E+01	Yes
Metals	Barium	mg/kg	7440-39-3	8.6E+01	1.2E+02	2.0E+02	L	1.1E+02	1.5E+02	1.5E+02	3.5E+02	L	No	8.8E+01	Yes
Metals	Beryllium	mg/kg	7440-41-7	5.4E-01	8.8E-01	1.6E+00	L	5.6E-01	9.5E-01	9.5E-01	2.5E+00	L	No	8.8E-01	Yes
Metals	Cadmium	mg/kg	7440-43-9	1.0E+00	2.4E+00	4.6E+00	L	2.6E+00	6.3E+00	6.3E+00	2.7E+01	L	No		Yes
Metals	Calcium	mg/kg	7440-70-2	3.6E+04	1.8E+05	1.7E+05	L	3.1E+04	2.0E+05	2.0E+05	2.2E+05	L	No	1.6E+04	Yes
Metals	Chromium	mg/kg	7440-47-3	2.0E+01	3.5E+01	1.6E+02	X	3.0E+01	4.4E+01	4.4E+01	1.7E+02	X	No	1.7E+01	Yes
Metals	Cobalt	mg/kg	7440-48-4	6.1E+00	7.7E+00	1.4E+01	L	7.5E+00	8.2E+00	8.2E+00	1.1E+01	N	No	1.0E+01	Yes
Metals	Copper	mg/kg	7440-50-8	4.9E+01	1.0E+02	5.1E+02	X	3.8E+01	5.6E+01	5.6E+01	1.9E+02	L	No	1.8E+01	Yes
Metals	Cyanide	mg/kg	57-12-5	1.1E-01		1.1E-01	X	4.0E-01	5.5E-01	5.5E-01	1.0E+00	D	No		Yes
Metals	Iron	mg/kg	7439-89-6	2.2E+04	3.1E+04	1.0E+05	X	2.4E+04	3.0E+04	3.0E+04	9.0E+04	X	No	2.3E+04	Yes
Metals	Lead	mg/kg	7439-92-1	1.4E+02	3.9E+02	9.9E+02	L	2.4E+02	6.1E+02	6.1E+02	1.6E+03	L	No	2.6E+01	Yes
Metals	Magnesium	mg/kg	7439-95-4	3.7E+03	5.4E+03	8.8E+03	L	4.1E+03	5.5E+03	5.5E+03	1.7E+04	X	No	3.0E+03	Yes
Metals	Manganese	mg/kg	7439-96-5	5.4E+02	9.4E+02	1.8E+03	L	9.2E+02	1.3E+03	1.3E+03	4.1E+03	X	No	1.5E+03	Yes
Metals	Mercury	mg/kg	7487-94-6	5.3E-01	1.3E+00	7.4E+00	X	8.5E-02	1.4E-01	1.4E-01	4.2E-01	L	Yes	3.6E-02	Yes
Metals	Nickel	mg/kg	7440-02-0	1.7E+01	2.1E+01	4.8E+01	L	1.9E+01	2.3E+01	2.3E+01	6.1E+01	X	No	2.1E+01	Yes
Metals	Potassium	mg/kg	7440-09-7	6.5E+02	7.8E+02	1.2E+03	L	1.1E+03	1.2E+03	1.2E+03	1.8E+03	L	No	9.3E+02	Yes
Metals	Selenium	mg/kg	7782-49-2	9.9E-01	1.3E+00	1.2E+00	D	5.5E-01	6.9E-01	6.9E-01	1.8E+00	D	Yes	1.4E+00	No
Metals	Sodium	mg/kg	7440-23-5	2.3E+02	3.0E+02	1.8E+02	D	2.3E+02	3.0E+02	3.0E+02	9.3E+02	D	No	1.2E+02	Yes
Metals	Thallium	mg/kg	6533-73-9	5.3E-01	6.5E-01	1.2E+00	N	5.6E-01	6.0E-01	6.0E-01	8.0E-01	L	No		Yes
Metals	Vanadium	mg/kg	7440-62-2	1.4E+01	1.9E+01	4.1E+01	L	1.5E+01	1.8E+01	1.8E+01	2.7E+01	L	No	3.1E+01	Yes
Metals	Zinc	mg/kg	7440-66-6	2.0E+02	3.4E+02	7.5E+02	L	1.9E+02	2.6E+02	2.6E+02	6.7E+02	L	No	6.2E+01	Yes
Organics-Explosives	Nitrocellulose	mg/kg	9004-70-0	7.4E+00	2.4E+01	1.9E+01	D	2.6E+00	4.5E+00	4.5E+00	1.5E+01	D	Yes		Yes
Organics-Pesticide/PCB	PCB-1254	mg/kg	11097-69-1	2.9E+00	7.8E+00	4.8E+01	D	1.8E+00	7.6E+04	4.3E+00	4.3E+00	L	No		Yes
Organics-Pesticide/PCB	PCB-1260	mg/kg	11096-82-5	4.6E-01	1.1E+00	5.7E+00	D	1.3E-01	2.3E-01	2.3E-01		D	Yes		Yes
Organics-Semivolatile	Bis(2-ethylhexyl)phthalate	mg/kg	117-81-7	1.2E-01	2.5E-01	6.1E-02	D	6.5E-01	1.6E+00	3.4E-01	3.4E-01	D	No		Yes
Organics-Semivolatile	Fluoranthene	mg/kg	206-44-0	8.6E-02	1.8E-01	7.0E-02	D	8.4E+00	7.0E+06	3.9E+01	3.9E+01	L	No		Yes
Organics-Semivolatile	Phenanthrene	mg/kg	85-01-8	2.5E-01	3.8E-01	6.0E-02	D	6.3E+00	8.0E+06	3.0E+01	3.0E+01	L	No		Yes
Organics-Semivolatile	Pyrene	mg/kg	129-00-0	1.4E-01	2.3E-01	6.9E-02	D	8.7E+00	8.8E+06	4.1E+01	4.1E+01	L	No		Yes
Organics-Volatile	2-Butanone	mg/kg	78-93-3	1.1E-02	1.6E-02	1.3E-02	D	6.0E-03	6.0E-03	6.0E-03		D	Yes		Yes
Organics-Volatile	Acetone	mg/kg	67-64-1	1.7E-02	3.8E-02	4.2E-02	N	6.0E-03	6.0E-03	6.0E-03		D	Yes		Yes
Organics-Volatile	Toluene	mg/kg	108-88-3	2.3E-03	8.0E-02	5.1E-03	L	2.9E-03	3.0E-03	3.0E-03		D	No		Yes
Packaging and Shipping Areas Aggregate															
Metals	Aluminum	mg/kg	7429-90-5	1.0E+04	1.2E+04	1.5E+04	N	1.1E+04	1.3E+04	1.3E+04	2.6E+04	L	No	1.8E+04	No
Metals	Antimony	mg/kg	7440-36-0	8.8E-01	1.2E+00	1.5E+00	D	9.5E-01	1.3E+00	1.3E+00	9.1E+00	D	No	9.6E-01	Yes
Metals	Arsenic	mg/kg	7440-38-2	8.3E+00	9.7E+00	1.3E+01	N	1.0E+01	1.1E+01	1.1E+01	1.8E+01	N	No	1.5E+01	No
Metals	Barium	mg/kg	7440-39-3	1.1E+02	2.1E+02	2.7E+02	L	1.1E+02	1.4E+02	1.4E+02	4.1E+02	L	No	8.8E+01	Yes
Metals	Beryllium	mg/kg	7440-41-7	8.4E-01	1.3E+00	2.1E+00	D	7.4E-01	9.7E-01	9.7E-01	3.4E+00	X	No	8.8E-01	Yes
Metals	Cadmium	mg/kg	7440-43-9	1.9E+00	1.9E+01	9.1E+00	L	3.2E+00	6.5E+00	6.5E+00	4.8E+01	L	No		Yes
Metals	Calcium	mg/kg	7440-70-2	2.2E+04	3.3E+04	5.3E+04	N	2.8E+04	4.0E+04	4.0E+04	1.6E+05	X	No	1.6E+04	Yes
Metals	Chromium	mg/kg	7440-47-3	1.2E+01	1.8E+01	3.0E+01	L	2.5E+01	3.5E+01	3.5E+01	3.1E+02	X	No	1.7E+01	Yes
Metals	Cobalt	mg/kg	7440-48-4	5.4E+00	6.8E+00	8.5E+00	L	8.7E+00	1.0E+01	1.0E+01	3.2E+01	L	No	1.0E+01	No
Metals	Copper	mg/kg	7440-50-8	2.5E+01	3.9E+01	5.6E+01	L	1.1E+02	1.9E+02	1.9E+02	2.4E+03	X	No	1.8E+01	Yes
Metals	Iron	mg/kg	7439-89-6	1.8E+04	2.7E+04	3.8E+04	L	2.0E+04	2.3E+04	2.3E+04	5.8E+04	L	No	2.3E+04	Yes
Metals	Lead	mg/kg	7439-92-1	9.6E+01	1.8E+02	5.0E+02	X	1.7E+02	2.5E+02	2.5E+02	1.8E+03	X	No	2.6E+01	Yes
Metals	Magnesium	mg/kg	7439-95-4	5.0E+03	1.3E+04	1.3E+04	L	5.1E+03	6.5E+03	6.5E+03	2.0E+04	X	No	3.0E+03	Yes
Metals	Manganese	mg/kg	7439-96-5	6.6E+02	1.4E+03	1.9E+03	L	1.0E+03	1.3E+03	1.3E+03	3.7E+03	L	No	1.5E+03	Yes
Metals	Mercury	mg/kg	7487-94-6	2.8E-02	5.4E-02	7.8E-02	L	7.1E-02	9.1E-02	9.1E-02	4.1E-01	L	No	3.6E-02	Yes

Appendix Table R-5. LL4 Soil Detected Anayltes

Analysis Type	Analyte	Units	CAS Number	LL4 Mean	LL4 95% UCL of Mean	LL4 Max. Detect	LL4 Dist.	LL1 Mean	LL1 95% UCL of Mean	LL1 Exp. Conc.	LL1 Max. Detect	LL1 Dist.	Is LL4 Mean > LL1 Exp. Conc?	Bkg. Criteria	Is LL4 Max. Det. > Bkg. Criteria?
Metals	Nickel	mg/kg	7440-02-0	1.4E+01	1.8E+01	2.6E+01	L	1.8E+01	2.1E+01	2.1E+01	6.2E+01	X	No	2.1E+01	Yes
Metals	Potassium	mg/kg	7440-09-7	6.7E+02	9.6E+02	1.4E+03	L	1.1E+03	1.3E+03	1.3E+03	3.6E+03	L	No	9.3E+02	Yes
Metals	Selenium	mg/kg	7782-49-2	9.4E-01	1.5E+00	1.4E+00	L	6.7E-01	8.3E-01	8.3E-01	3.6E+00	D	Yes	1.4E+00	No
Metals	Sodium	mg/kg	7440-23-5	2.9E+02	3.7E+02	3.3E+02	N	3.2E+02	3.8E+02	3.8E+02	1.4E+03	X	No	1.2E+02	Yes
Metals	Thallium	mg/kg	6533-73-9	3.1E-01	3.9E-01	5.8E-01	N	4.5E-01	4.9E-01	4.9E-01	7.8E-01	L	No		Yes
Metals	Vanadium	mg/kg	7440-62-2	1.1E+01	1.7E+01	2.4E+01	L	1.5E+01	1.7E+01	1.7E+01	3.8E+01	L	No	3.1E+01	No
Metals	Zinc	mg/kg	7440-66-6	2.3E+02	5.7E+02	8.4E+02	L	3.4E+02	4.6E+02	4.6E+02	2.1E+03	X	No	6.2E+01	Yes
Organics-Explosives	Nitrocellulose	mg/kg	9004-70-0	9.0E+00		9.0E+00	X	1.1E+01	1.8E+01	1.8E+01	1.0E+02	D	No		Yes
Organics-Pesticide/PCB	4,4'-DDE	mg/kg	72-55-9	3.8E-02		3.8E-02	X	2.9E-02	2.6E+03	8.2E-02	8.2E-02	L	No		Yes
Organics-Pesticide/PCB	alpha-Chlordane	mg/kg	5103-71-9	1.4E-02		1.4E-02	X	4.6E-03	7.5E-03	7.5E-03		D	Yes		Yes
Organics-Pesticide/PCB	Dieldrin	mg/kg	60-57-1	1.4E-02		1.4E-02	X	4.6E-03	7.5E-03	7.5E-03		D	Yes		Yes
Organics-Pesticide/PCB	Endrin aldehyde	mg/kg	7421-93-4	5.7E-02		5.7E-02	X	2.1E-02	9.1E+01	5.3E-02	5.3E-02	L	Yes		Yes
Organics-Pesticide/PCB	gamma-Chlordane	mg/kg	5103-74-2	1.1E-02		1.1E-02	X	1.0E-02	2.1E-02	2.1E-02	3.5E-02	D	No		Yes
Organics-Pesticide/PCB	Methoxychlor	mg/kg	72-43-5	2.5E-02		2.5E-02	X	8.8E-03	1.4E-02	1.4E-02		D	Yes		Yes
Organics-Pesticide/PCB	PCB-1254	mg/kg	11097-69-1	2.2E-01	3.8E-01	7.5E-01	D	8.6E-01	1.7E+00	1.7E+00	2.4E+00	N	No		Yes
Organics-Pesticide/PCB	PCB-1260	mg/kg	11096-82-5	1.6E-01	3.9E-01	1.3E+00	D	1.1E-01	1.9E-01	1.9E-01		D	No		Yes
Organics-Semivolatile	Benz(a)anthracene	mg/kg	56-55-3	6.8E-02	2.3E-01	9.3E-02	N	1.8E-01	5.9E-01	4.1E-01	4.1E-01	L	No		Yes
Organics-Semivolatile	Benzo(a)pyrene	mg/kg	50-32-8	6.5E-02	2.9E-01	1.0E-01	N	1.8E-01	4.3E-01	3.7E-01	3.7E-01	L	No		Yes
Organics-Semivolatile	Benzo(b)fluoranthene	mg/kg	205-99-2	1.2E-01	2.1E-01	1.3E-01	N	2.1E-01	4.5E-01	4.5E-01	4.7E-01	L	No		Yes
Organics-Semivolatile	Benzo(ghi)perylene	mg/kg	191-24-2	8.3E-02	1.9E-01	1.0E-01	N	1.6E-01	2.1E-01	2.1E-01	2.4E-01	N	No		Yes
Organics-Semivolatile	Benzo(k)fluoranthene	mg/kg	207-08-9	6.9E-02	1.4E-01	8.0E-02	N	1.9E-01	2.0E-01	2.0E-01	2.1E-01	D	No		Yes
Organics-Semivolatile	Bis(2-ethylhexyl)phthalate	mg/kg	117-81-7	1.1E-01	3.1E-01	7.8E-02	N	1.9E-01	2.0E-01	2.0E-01		D	No		Yes
Organics-Semivolatile	Chrysene	mg/kg	218-01-9	1.1E-01	2.8E-01	1.4E-01	N	2.0E-01	6.0E-01	4.8E-01	4.8E-01	L	No		Yes
Organics-Semivolatile	Fluoranthene	mg/kg	206-44-0	2.1E-01	7.2E-01	2.9E-01	N	3.0E-01	5.8E-01	5.8E-01	1.0E+00	X	No		Yes
Organics-Semivolatile	Phenanthrene	mg/kg	85-01-8	1.1E-01	5.1E-01	1.7E-01	N	2.2E-01	3.2E-01	3.2E-01	4.5E-01	D	No		Yes
Organics-Semivolatile	Pyrene	mg/kg	129-00-0	2.5E-01	7.2E-01	1.8E-01	N	2.6E-01	9.8E-01	7.9E-01	7.9E-01	L	No		Yes
Organics-Volatile	Toluene	mg/kg	108-88-3	2.5E-03	3.9E-03	1.6E-03	D	3.1E-03	3.7E-03	3.7E-03	4.4E-03	D	No		Yes
Perimeter Area Aggregate															
Metals	Aluminum	mg/kg	7429-90-5	1.1E+04	1.1E+04	1.5E+04	N	1.3E+04	1.4E+04	1.4E+04	2.1E+04	L	No	1.8E+04	No
Metals	Arsenic	mg/kg	7440-38-2	8.1E+00	8.9E+00	1.2E+01	N	1.1E+01	1.3E+01	1.3E+01	2.5E+01	L	No	1.5E+01	No
Metals	Barium	mg/kg	7440-39-3	5.7E+01	6.5E+01	1.1E+02	L	8.3E+01	9.2E+01	9.2E+01	1.4E+02	L	No	8.8E+01	Yes
Metals	Beryllium	mg/kg	7440-41-7	4.1E-01	5.4E-01	1.5E+00	D	4.3E-01	5.0E-01	5.0E-01	8.2E-01	N	No	8.8E-01	Yes
Metals	Cadmium	mg/kg	7440-43-9	2.3E-01	2.8E-01	5.4E-01	N	2.4E-01	2.7E-01	2.7E-01	3.2E-01	D	No		Yes
Metals	Calcium	mg/kg	7440-70-2	5.8E+03	1.2E+04	5.3E+04	X	2.0E+03	4.2E+03	4.2E+03	3.4E+04	X	Yes	1.6E+04	Yes
Metals	Chromium	mg/kg	7440-47-3	1.9E+01	2.7E+01	1.2E+02	X	1.6E+01	1.7E+01	1.7E+01	2.5E+01	L	Yes	1.7E+01	Yes
Metals	Cobalt	mg/kg	7440-48-4	6.8E+00	8.0E+00	1.5E+01	N	9.8E+00	1.1E+01	1.1E+01	2.1E+01	L	No	1.0E+01	Yes
Metals	Copper	mg/kg	7440-50-8	1.1E+01	1.2E+01	1.6E+01	N	1.1E+01	1.2E+01	1.2E+01	2.0E+01	L	No	1.8E+01	No
Metals	Iron	mg/kg	7439-89-6	1.6E+04	1.8E+04	2.4E+04	N	2.2E+04	2.4E+04	2.4E+04	3.3E+04	L	No	2.3E+04	Yes
Metals	Lead	mg/kg	7439-92-1	1.2E+02	2.3E+02	1.3E+03	X	1.9E+01	2.1E+01	2.1E+01	3.5E+01	L	Yes	2.6E+01	Yes
Metals	Magnesium	mg/kg	7439-95-4	2.2E+03	2.9E+03	8.2E+03	L	1.8E+03	1.9E+03	1.9E+03	3.2E+03	L	Yes	3.0E+03	Yes
Metals	Manganese	mg/kg	7439-96-5	4.3E+02	6.6E+02	1.8E+03	L	9.2E+02	1.4E+03	1.4E+03	2.3E+03	L	No	1.5E+03	Yes
Metals	Mercury	mg/kg	7487-94-6	4.4E-02	5.2E-02	9.4E-02	N	5.4E-02	6.1E-02	6.1E-02	9.3E-02	N	No	3.6E-02	Yes
Metals	Nickel	mg/kg	7440-02-0	1.2E+01	1.4E+01	1.9E+01	N	1.5E+01	1.6E+01	1.6E+01	2.3E+01	L	No	2.1E+01	No
Metals	Potassium	mg/kg	7440-09-7	6.5E+02	7.3E+02	1.0E+03	N	8.9E+02	1.0E+03	1.0E+03	1.5E+03	L	No	9.3E+02	Yes
Metals	Selenium	mg/kg	7782-49-2	7.7E-01	9.1E-01	1.2E+00	N	6.4E-01	7.9E-01	7.9E-01	1.7E+00	X	No	1.4E+00	No
Metals	Sodium	mg/kg	7440-23-5	2.9E+02	3.5E+02	1.7E+02	D	2.9E+02	3.1E+02	3.1E+02		D	No	1.2E+02	Yes
Metals	Thallium	mg/kg	6533-73-9	4.3E-01	4.9E-01	6.7E-01	N	6.0E-01	6.4E-01	6.4E-01	8.6E-01	L	No		Yes
Metals	Vanadium	mg/kg	7440-62-2	1.6E+01	1.8E+01	2.3E+01	N	2.7E+01	2.9E+01	2.9E+01	4.6E+01	L	No	3.1E+01	No
Metals	Zinc	mg/kg	7440-66-6	5.7E+01	6.8E+01	1.2E+02	L	5.8E+01	6.2E+01	6.2E+01	7.8E+01	N	No	6.2E+01	Yes
Organics-Semivolatile	Benz(a)anthracene	mg/kg	56-55-3	1.7E-01	2.6E-01	1.1E-01	D	2.0E-01	2.4E-01	2.4E-01		D	No		Yes
Organics-Semivolatile	Benzo(a)pyrene	mg/kg	50-32-8	2.6E-01	3.5E-01	1.4E-01	D	2.0E-01	2.4E-01	2.4E-01		D	Yes		Yes
Organics-Semivolatile	Benzo(b)fluoranthene	mg/kg	205-99-2	1.9E-01	3.5E-01	1.6E-01	D	1.2E-01	6.4E-01	4.2E-02	4.2E-02	N	Yes		Yes
Organics-Semivolatile	Benzo(ghi)perylene	mg/kg	191-24-2	1.7E-01	2.8E-01	1.2E-01	D	2.0E-01	2.4E-01	2.4E-01		D	No		Yes
Organics-Semivolatile	Benzo(k)fluoranthene	mg/kg	207-08-9	2.2E-01	3.6E-01	7.8E-02	D	2.0E-01	2.4E-01	2.4E-01		D	No		Yes
Organics-Semivolatile	Bis(2-ethylhexyl)phthalate	mg/kg	117-81-7	1.6E-01	2.7E-01	3.1E-01	N	2.0E-01	2.4E-01	2.4E-01		D	No		Yes
Organics-Semivolatile	Chrysene	mg/kg	218-01-9	2.4E-01	3.3E-01	1.4E-01	D	2.0E-01	2.4E-01	2.4E-01		D	No		Yes
Organics-Semivolatile	Fluoranthene	mg/kg	206-44-0	2.3E-01	3.4E-01	1.8E-01	D	1.3E-01	6.0E-01	5.7E-02	5.7E-02	N	Yes		Yes

Appendix Table R-5. LL4 Soil Detected Anayltes

Analysis Type	Analyte	Units	CAS Number	LL4 Mean	LL4 95% UCL of Mean	LL4 Max. Detect	LL4 Dist.	LL1 Mean	LL1 95% UCL of Mean	LL1 Exp. Conc.	LL1 Max. Detect	LL1 Dist.	Is LL4 Mean > LL1 Exp. Conc?	Bkg. Criteria	Is LL4 Max. Det. > Bkg. Criteria?
Organics-Semivolatile	Indeno(1,2,3-cd)pyrene	mg/kg	193-39-5	2.7E-01	3.8E-01	9.9E-02	D	2.0E-01	2.4E-01	2.4E-01		D	Yes		Yes
Organics-Semivolatile	Pyrene	mg/kg	129-00-0	2.2E-01	3.0E-01	1.6E-01	D	2.0E-01	2.4E-01	2.4E-01		D	No		Yes
Organics-Volatile	Toluene	mg/kg	108-88-3	3.0E-03	4.9E-03	6.2E-04	D	3.0E-03	3.8E-03	3.8E-03		D	No		Yes
Melt-Pour Area Drainage Ditches Aggregate															
Metals	Aluminum	mg/kg	7429-90-5	6.6E+03	8.3E+03	1.3E+04	L	1.3E+04	1.4E+04	1.4E+04	2.1E+04	L	No	1.8E+04	No
Metals	Antimony	mg/kg	7440-36-0	8.7E-01	1.3E+00	2.0E+00	D	6.3E-01	6.5E-01	6.5E-01	8.1E-01	D	Yes	9.6E-01	Yes
Metals	Arsenic	mg/kg	7440-38-2	9.1E+00	1.1E+01	1.6E+01	N	1.1E+01	1.3E+01	1.3E+01	2.5E+01	L	No	1.5E+01	Yes
Metals	Barium	mg/kg	7440-39-3	4.6E+01	5.5E+01	8.4E+01	N	8.3E+01	9.2E+01	9.2E+01	1.4E+02	L	No	8.8E+01	No
Metals	Beryllium	mg/kg	7440-41-7	3.5E-01	4.3E-01	4.5E-01	N	4.3E-01	5.0E-01	5.0E-01	8.2E-01	N	No	8.8E-01	No
Metals	Cadmium	mg/kg	7440-43-9	1.5E-01	2.0E-01	3.2E-01	N	2.4E-01	2.7E-01	2.7E-01	3.2E-01	D	No		Yes
Metals	Calcium	mg/kg	7440-70-2	4.2E+03	5.8E+03	6.8E+03	L	2.0E+03	4.2E+03	4.2E+03	3.4E+04	X	Yes	1.6E+04	No
Metals	Chromium	mg/kg	7440-47-3	9.5E+00	1.1E+01	1.7E+01	L	1.6E+01	1.7E+01	1.7E+01	2.5E+01	L	No	1.7E+01	No
Metals	Cobalt	mg/kg	7440-48-4	7.4E+00	9.0E+00	9.9E+00	N	9.8E+00	1.1E+01	1.1E+01	2.1E+01	L	No	1.0E+01	No
Metals	Copper	mg/kg	7440-50-8	1.4E+01	1.7E+01	2.0E+01	N	1.1E+01	1.2E+01	1.2E+01	2.0E+01	L	Yes	1.8E+01	Yes
Metals	Cyanide	mg/kg	57-12-5	3.7E-01	1.7E+00	1.6E-01	N	4.3E-01	5.6E-01	5.6E-01	1.7E+00	D	No		Yes
Metals	Iron	mg/kg	7439-89-6	1.7E+04	2.2E+04	2.6E+04	N	2.2E+04	2.4E+04	2.4E+04	3.3E+04	L	No	2.3E+04	Yes
Metals	Lead	mg/kg	7439-92-1	1.4E+01	1.7E+01	2.7E+01	L	1.9E+01	2.1E+01	2.1E+01	3.5E+01	L	No	2.6E+01	Yes
Metals	Magnesium	mg/kg	7439-95-4	2.6E+03	3.2E+03	3.5E+03	N	1.8E+03	1.9E+03	1.9E+03	3.2E+03	L	Yes	3.0E+03	Yes
Metals	Manganese	mg/kg	7439-96-5	4.2E+02	6.4E+02	8.9E+02	L	9.2E+02	1.4E+03	1.4E+03	2.3E+03	L	No	1.5E+03	No
Metals	Mercury	mg/kg	7487-94-6	3.6E-02	5.0E-02	2.6E-02	D	5.4E-02	6.1E-02	6.1E-02	9.3E-02	N	No	3.6E-02	No
Metals	Nickel	mg/kg	7440-02-0	1.5E+01	1.8E+01	1.9E+01	N	1.5E+01	1.6E+01	1.6E+01	2.3E+01	L	No	2.1E+01	No
Metals	Potassium	mg/kg	7440-09-7	6.2E+02	7.8E+02	8.8E+02	N	8.9E+02	1.0E+03	1.0E+03	1.5E+03	L	No	9.3E+02	No
Metals	Selenium	mg/kg	7782-49-2	6.2E-01	8.5E-01	6.0E-01	D	6.4E-01	7.9E-01	7.9E-01	1.7E+00	X	No	1.4E+00	No
Metals	Sodium	mg/kg	7440-23-5	3.0E+02	4.1E+02	2.0E+02	D	2.9E+02	3.1E+02	3.1E+02		D	No	1.2E+02	Yes
Metals	Thallium	mg/kg	6533-73-9	4.5E-01	6.1E-01	7.3E-01	N	6.0E-01	6.4E-01	6.4E-01	8.6E-01	L	No		Yes
Metals	Vanadium	mg/kg	7440-62-2	9.9E+00	1.2E+01	1.3E+01	N	2.7E+01	2.9E+01	2.9E+01	4.6E+01	L	No	3.1E+01	No
Metals	Zinc	mg/kg	7440-66-6	7.2E+01	8.0E+01	1.1E+02	N	5.8E+01	6.2E+01	6.2E+01	7.8E+01	N	Yes	6.2E+01	Yes
Organics-Semivolatile	Fluoranthene	mg/kg	206-44-0	2.0E-01	4.0E-01	1.2E-01	D	1.3E-01	6.0E-01	5.7E-02	5.7E-02	N	Yes		Yes
Organics-Semivolatile	Phenanthrene	mg/kg	85-01-8	3.5E-01	7.6E-01	1.6E-01	D	2.0E-01	2.4E-01	2.4E-01		D	Yes		Yes
Organics-Semivolatile	Pyrene	mg/kg	129-00-0	3.5E-01	7.8E-01	1.2E-01	D	2.0E-01	2.4E-01	2.4E-01		D	Yes		Yes
Organics-Volatile	Acetone	mg/kg	67-64-1	4.5E-03	1.6E-02	6.3E-03	N	6.3E-03	7.8E-03	7.8E-03		D	No		Yes

Appendix Table R-6. LL4 Analytes Whose Means Do Not Exceed LL1 Exposure Concentrations, Plus Maximum LL1 HQs and Comparison of LL4 Maximum Detect to Background

Analysis Type	Analyte	Units	CAS Number	LL4 Mean	LL4 95% UCL of Mean	LL4 Max. Detect	LL4 Dist.	LL1 Mean	LL1 95% UCL of Mean	LL1 Exp. Conc	LL1 Max. Detect	LL1 Dist.	Is LL4 Mea > LL1 Exp. Conc?	Maximum LL 1 HQ From SERA	Is Max LL 1 HQ < 1 (i.e., LL 4 SRC is NFA)'	Bkg. Criteria	Is LL 4 SRC Max. Det. < Bkg (i.e., NFA)?
Explosives Handling Areas Aggregate																	
Metals	Aluminum	mg/kg	7429-90-5	9.8E+03	1.1E+04	3.9E+04	X	9.4E+03	1.0E+04	1.0E+04	4.6E+04	X	No	4.98E+02	no	1.8E+04	no
Metals	Antimony	mg/kg	7440-36-0	5.6E-01	6.9E-01	2.2E+00	D	7.0E-01	7.5E-01	7.5E-01	3.0E+00	D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	9.6E-01	no
Metals	Arsenic	mg/kg	7440-38-2	8.8E+00	9.5E+00	1.8E+01	N	1.0E+01	1.1E+01	1.1E+01	5.6E+01	X	No	6.10E+00	no	1.5E+01	no
Metals	Barium	mg/kg	7440-39-3	8.7E+01	1.1E+02	7.5E+02	X	1.1E+02	1.4E+02	1.4E+02	2.0E+03	X	No	1.02E+00	no	8.8E+01	no
Metals	Cadmium	mg/kg	7440-43-9	8.3E-01	1.2E+00	1.3E+01	X	1.4E+00	1.8E+00	1.8E+00	2.7E+01	X	No	1.30E+01	no		no
Metals	Chromium	mg/kg	7440-47-3	1.3E+01	1.5E+01	6.8E+01	X	2.0E+01	2.5E+01	2.5E+01	4.0E+02	X	No	6.20E+01	no	1.7E+01	no
Metals	Cobalt	mg/kg	7440-48-4	8.7E+00	1.2E+01	7.8E+01	X	8.2E+00	8.9E+00	8.9E+00	4.9E+01	X	No	4.00E-01	**Yes**	1.0E+01	NA
Metals	Copper	mg/kg	7440-50-8	2.1E+01	2.5E+01	1.1E+02	L	6.2E+01	1.1E+02	1.1E+02	3.7E+03	X	No	2.00E+00	no	1.8E+01	no
Metals	Cyanide	mg/kg	57-12-5	2.4E-01	3.2E-01	5.1E-01	D	4.6E-01	5.5E-01	5.5E-01	3.8E+00	D	No	6.00E-04	**Yes**		NA
Metals	Iron	mg/kg	7439-89-6	1.9E+04	2.0E+04	3.0E+04	N	2.1E+04	2.3E+04	2.3E+04	1.1E+05	X	No	2.25E+03	no	2.3E+04	no
Metals	Lead	mg/kg	7439-92-1	1.4E+02	2.8E+02	5.8E+03	X	2.0E+02	2.8E+02	2.8E+02	7.1E+03	X	No	4.61E+02	no	2.6E+01	no
Metals	Mercury	mg/kg	7487-94-6	3.8E-02	4.8E-02	3.6E-01	D	2.2E-01	3.4E-01	3.4E-01	9.7E+00	X	No	3.40E+00	no	3.6E-02	no
Metals	Nickel	mg/kg	7440-02-0	1.6E+01	1.7E+01	3.2E+01	N	1.6E+01	1.8E+01	1.8E+01	1.0E+02	X	No	6.00E-01	**Yes**	2.1E+01	NA
Metals	Potassium	mg/kg	7440-09-7	8.9E+02	1.0E+03	2.3E+03	L	9.3E+02	1.0E+03	1.0E+03	5.7E+03	X	No	No HQ	no HQ at LL 1 because no TRVs	9.3E+02	no
Metals	Vanadium	mg/kg	7440-62-2	1.4E+01	1.5E+01	2.0E+01	N	1.8E+01	1.9E+01	1.9E+01	7.8E+01	X	No	1.00E+01	no	3.1E+01	**Yes**
Metals	Zinc	mg/kg	7440-66-6	1.6E+02	2.6E+02	3.7E+03	X	1.6E+02	1.9E+02	1.9E+02	1.7E+03	X	No	1.43E+02	no	6.2E+01	no
Organics-Explosives	2,4,6-Trinitrotoluene	mg/kg	118-96-7	2.3E-01	3.2E-01	2.2E+00	D	1.6E+02	3.0E+02	3.0E+02	4.8E+03	X	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Explosives	HMX	mg/kg	2691-41-0	1.0E+00	1.2E+00	3.6E+00	D	8.4E+00	1.6E+01	1.6E+01	2.6E+02	D	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Explosives	RDX	mg/kg	121-82-4	8.0E-01	1.4E+00	1.9E+01	D	4.8E+01	1.0E+02	1.0E+02	2.3E+03	D	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Pesticide/PCB	4,4'-DDD	mg/kg	72-54-8	8.4E-03	1.8E-02	1.0E-01	D	1.9E-02	3.9E-02	3.9E-02		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Organics-Pesticide/PCB	4,4'-DDE	mg/kg	72-55-9	7.6E-03	1.3E-02	4.9E-02	D	5.1E-01	1.2E+00	1.2E+00	6.7E+00	X	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Pesticide/PCB	4,4'-DDT	mg/kg	50-29-3	3.7E-02	7.3E-02	2.9E-01	D	2.1E-02	4.1E-02	4.1E-02	4.1E-02	D	No	3.30E+01	no		no
Organics-Pesticide/PCB	Aldrin	mg/kg	309-00-2	5.5E-03	1.0E-02	4.3E-02	D	1.9E-02	3.9E-02	3.9E-02		D	No	--			no
Organics-Pesticide/PCB	alpha-Chlordane	mg/kg	5103-71-9	7.2E-03	1.2E-02	3.4E-02	D	3.3E-02	7.8E-02	7.8E-02	4.4E-01	D	No	2.00E-01	**Yes**		NA
Organics-Pesticide/PCB	Dieldrin	mg/kg	60-57-1	7.7E-03	1.5E-02	7.0E-02	D	4.3E-02	9.8E-02	9.8E-02	5.5E-01	D	No	2.30E+01	no		no
Organics-Pesticide/PCB	Endosulfan II	mg/kg	33213-65-9	5.2E-03	9.1E-03	3.7E-02	D	1.9E-02	3.9E-02	3.9E-02		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Organics-Pesticide/PCB	Endrin	mg/kg	72-20-8	5.2E-03	7.3E-03	1.8E-02	D	1.9E-02	3.9E-02	3.9E-02		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Organics-Pesticide/PCB	Endrin aldehyde	mg/kg	7421-93-4	5.6E-02	1.4E-01	8.4E-01	D	3.1E-01	6.4E+00	4.4E+00	4.4E+00	L	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Pesticide/PCB	Endrin ketone	mg/kg	53494-70-5	3.0E-03	4.4E-03	1.1E-02	D	1.9E-02	3.9E-02	1.4E-02	1.4E-02	D	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Pesticide/PCB	gamma-Chlordane	mg/kg	5103-74-2	9.4E-03	1.8E-02	8.3E-02	D	3.5E-01	8.9E-01	8.9E-01	5.3E+00	D	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Pesticide/PCB	Heptachlor	mg/kg	76-44-8	4.1E-02	1.1E-01	6.7E-01	D	3.5E-02	7.2E-02	7.2E-02	3.2E-01	D	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Pesticide/PCB	Heptachlor epoxide	mg/kg	1024-57-3	4.5E-03	9.8E-03	5.2E-02	D	2.0E-02	4.0E-02	3.1E-02	3.1E-02	D	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Pesticide/PCB	PCB-1254	mg/kg	11097-69-1	3.4E-01	5.4E-01	3.2E+00	D	7.0E+01	4.0E+03	1.1E+03	1.1E+03	L	No	1.16E+05	no		no

Appendix Table R-6. LL4 Analytes Whose Means Do Not Exceed LL1 Exposure Concentrations, Plus Maximum LL1 HQs and Comparison of LL4 Maximum Detect to Background

Analysis Type	Analyte	Units	CAS Number	LL4 Mean	LL4 95% UCL of Mean	LL4 Max. Detect	LL4 Dist.	LL1 Mean	LL1 95% UCL of Mean	LL1 Exp. Conc.	LL1 Max. Detect	LL1 Dist.	Is LL4 Mea > LL1 Exp. Conc?	Maximum LL 1 HQ From SERA	Is Max LL 1 HQ < 1 (i.e., LL 4 SRC is NFA)?	Bkg. Criteria	Is LL 4 SRC Max. Det. < Bkg (i.e., NFA)?
Organics-Pesticide/PCB	PCB-1260	mg/kg	11096-82-5	1.5E+00	2.9E+00	2.8E+01	D	2.4E+00	6.3E+00	6.3E+00		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Organics-Semivolatile	Acenaphthylene	mg/kg	208-96-8	3.0E-01	3.8E-01	5.6E-01	D	3.7E-01	5.5E-01	5.5E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Organics-Semivolatile	Anthracene	mg/kg	120-12-7	3.5E-01	4.7E-01	1.2E+00	D	3.6E-01	5.4E-01	5.4E-01	5.5E-01	D	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Semivolatile	Benz(a)anthracene	mg/kg	56-55-3	4.5E-01	6.7E-01	2.1E+00	D	4.3E-01	6.4E-01	6.4E-01	1.2E+00	D	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Semivolatile	Benzo(a)pyrene	mg/kg	50-32-8	4.6E-01	7.5E-01	2.7E+00	D	4.1E-01	6.1E-01	6.1E-01	1.0E+00	D	No	5.00E-02	**Yes**		NA
Organics-Semivolatile	Carbazole	mg/kg	86-74-8	2.9E-01	4.2E-01	1.4E+00	D	3.8E-01	5.6E-01	3.8E-01	3.8E-01	D	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Semivolatile	Di-n-butyl phthalate	mg/kg	84-74-2	3.0E-01	4.0E-01	9.2E-01	D	3.7E-01	5.5E-01	5.5E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Organics-Semivolatile	Fluoranthene	mg/kg	206-44-0	8.2E-01	3.1E+00	8.1E+00	L	5.5E-01	9.1E-01	9.1E-01	2.9E+00	D	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Semivolatile	Fluorene	mg/kg	86-73-7	2.2E-01	2.7E-01	1.2E-01	D	3.8E-01	5.6E-01	3.1E-01	3.1E-01	D	No	6.00E-03	**Yes**		NA
Organics-Semivolatile	Phenanthrene	mg/kg	85-01-8	4.2E-01	6.1E-01	2.3E+00	D	4.9E-01	7.7E-01	7.7E-01	2.5E+00	D	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Semivolatile	Pyrene	mg/kg	129-00-0	6.8E-01	3.0E+00	5.4E+00	L	5.4E-01	8.3E-01	8.3E-01	2.3E+00	D	No	8.30E-05	**Yes**		NA
Organics-Volatile	Chloroform	mg/kg	67-66-3	3.1E-03	3.9E-03	2.0E-03	D	3.1E-03	3.4E-03	3.4E-03		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Organics-Volatile	Toluene	mg/kg	108-88-3	2.7E-03	3.8E-03	1.2E-02	D	3.1E-03	3.4E-03	3.4E-03		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Preparation and Receiving Areas Aggregate																	
Metals	Aluminum	mg/kg	7429-90-5	9.0E+03	1.1E+04	1.6E+04	N	9.8E+03	1.2E+04	1.2E+04	2.3E+04	L	No	5.92E+02	no	1.8E+04	**Yes**
Metals	Arsenic	mg/kg	7440-38-2	1.0E+01	1.4E+01	2.7E+01	L	1.2E+01	1.3E+01	1.3E+01	1.9E+01	N	No	7.00E+00	no	1.5E+01	no
Metals	Barium	mg/kg	7440-39-3	8.6E+01	1.2E+02	2.0E+02	L	1.1E+02	1.5E+02	1.5E+02	3.5E+02	L	No	1.10E+00	no	8.8E+01	no
Metals	Beryllium	mg/kg	7440-41-7	5.4E-01	8.8E-01	1.6E+00	L	5.6E-01	9.5E-01	9.5E-01	2.5E+00	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	8.8E-01	no
Metals	Cadmium	mg/kg	7440-43-9	1.0E+00	2.4E+00	4.6E+00	L	2.6E+00	6.3E+00	6.3E+00	2.7E+01	L	No	4.40E+01	no		no
Metals	Calcium	mg/kg	7440-70-2	3.6E+04	1.8E+05	1.7E+05	L	3.1E+04	2.0E+05	2.0E+05	2.2E+05	L	No	No HQ	no HQ at LL 1 because no TRVs	1.6E+04	no
Metals	Chromium	mg/kg	7440-47-3	2.0E+01	3.5E+01	1.6E+02	X	3.0E+01	4.4E+01	4.4E+01	1.7E+02	X	No	1.10E+02	no	1.7E+01	no
Metals	Cobalt	mg/kg	7440-48-4	6.1E+00	7.7E+00	1.4E+01	L	7.5E+00	8.2E+00	8.2E+00	1.1E+01	N	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	1.0E+01	no
Metals	Copper	mg/kg	7440-50-8	4.9E+01	1.0E+02	5.1E+02	X	3.8E+01	5.6E+01	5.6E+01	1.9E+02	L	No	9.00E-01	**Yes**	1.8E+01	NA
Metals	Cyanide	mg/kg	57-12-5	1.1E-01		1.1E-01	X	4.0E-01	5.5E-01	5.5E-01	1.0E+00	D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Metals	Iron	mg/kg	7439-89-6	2.2E+04	3.1E+04	1.0E+05	X	2.4E+04	3.0E+04	3.0E+04	9.0E+04	X	No	3.02E+03	no	2.3E+04	no
Metals	Lead	mg/kg	7439-92-1	1.4E+02	3.9E+02	9.9E+02	L	2.4E+02	6.1E+02	6.1E+02	1.6E+03	L	No	4.00E+01	no	2.6E+01	no

Appendix Table R-6. LL4 Analytes Whose Means Do Not Exceed LL1 Exposure Concentrations, Plus Maximum LL1 HQs and Comparison of LL4 Maximum Detect to Background

Analysis Type	Analyte	Units	CAS Number	LL4 Mean	LL4 95% UCL of Mean	LL4 Max. Detect	LL4 Dist.	LL1 Mean	LL1 95% UCL of Mean	LL1 Exp. Conc.	LL1 Max. Detect	LL1 Dist.	Is LL4 Mea > LL1 Exp. Conc?	Maximum LL 1 HQ From SERA	Is Max LL 1 HQ < 1 (i.e., LL 4 SRC is NFA)?	Bkg. Criteria	Is LL 4 SRC Max. Det. < Bkg (i.e., NFA)?
Metals	Magnesium	mg/kg	7439-95-4	3.7E+03	5.4E+03	8.8E+03	L	4.1E+03	5.5E+03	5.5E+03	1.7E+04	X	No	No HQ	no HQ at LL 1 because no TRVs	3.0E+03	no
Metals	Manganese	mg/kg	7439-96-5	5.4E+02	9.4E+02	1.8E+03	L	9.2E+02	1.3E+03	1.3E+03	4.1E+03	X	No	2.50E+00	**Yes**	1.5E+03	NA
Metals	Nickel	mg/kg	7440-02-0	1.7E+01	2.1E+01	4.8E+01	L	1.9E+01	2.3E+01	2.3E+01	6.1E+01	X	No	1.00E-01	no	2.1E+01	no
Metals	Potassium	mg/kg	7440-09-7	6.5E+02	7.8E+02	1.2E+03	L	1.1E+03	1.2E+03	1.2E+03	1.8E+03	L	No	No HQ	no HQ at LL 1 because no TRVs	9.3E+02	no
Metals	Sodium	mg/kg	7440-23-5	2.3E+02	3.0E+02	1.8E+02	D	2.3E+02	3.0E+02	3.0E+02	9.3E+02	D	No	No HQ	no HQ at LL 1 because no TRVs	1.2E+02	no
Metals	Thallium	mg/kg	6533-73-9	5.3E-01	6.5E-01	1.2E+00	N	5.6E-01	6.0E-01	6.0E-01	8.0E-01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Metals	Vanadium	mg/kg	7440-62-2	1.4E+01	1.9E+01	4.1E+01	L	1.5E+01	1.8E+01	1.8E+01	2.7E+01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	3.1E+01	no
Metals	Zinc	mg/kg	7440-66-6	2.0E+02	3.4E+02	7.5E+02	L	1.9E+02	2.6E+02	2.6E+02	6.7E+02	L	No	1.95E+02	no	6.2E+01	no
Organics-Pesticide/PCB	PCB-1254	mg/kg	11097-69-1	2.9E+00	7.8E+00	4.8E+01	D	1.8E+00	7.6E+04	4.3E+00	4.3E+00	L	No	4.53E+02	no		no
Organics-Semivolatile	Bis(2-ethylhexyl)phthalate	mg/kg	117-81-7	1.2E-01	2.5E-01	6.1E-02	D	6.5E-01	1.6E+00	3.4E-01	3.4E-01	D	No	2.00E-02	**Yes**		NA
Organics-Semivolatile	Fluoranthene	mg/kg	206-44-0	8.6E-02	1.8E-01	7.0E-02	D	8.4E+00	7.0E+06	3.9E+01	3.9E+01	L	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Semivolatile	Phenanthrene	mg/kg	85-01-8	2.5E-01	3.8E-01	6.0E-02	D	6.3E+00	8.0E+06	3.0E+01	3.0E+01	L	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Semivolatile	Pyrene	mg/kg	129-00-0	1.4E-01	2.3E-01	6.9E-02	D	8.7E+00	8.8E+06	4.1E+01	4.1E+01	L	No	4.00E-03	**Yes**		NA
Organics-Volatile	Toluene	mg/kg	108-88-3	2.3E-03	8.0E-02	5.1E-03	L	2.9E-03	3.0E-03	3.0E-03		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Packaging and Shipping Areas Aggregate																	
Metals	Aluminum	mg/kg	7429-90-5	1.0E+04	1.2E+04	1.5E+04	N	1.1E+04	1.3E+04	1.3E+04	2.6E+04	L	No	6.39E+02	no	1.8E+04	**Yes**
Metals	Antimony	mg/kg	7440-36-0	8.8E-01	1.2E+00	1.5E+00	D	9.5E-01	1.3E+00	1.3E+00	9.1E+00	D	No	9.00E-01	**Yes**	9.6E-01	NA
Metals	Arsenic	mg/kg	7440-38-2	8.3E+00	9.7E+00	1.3E+01	N	1.0E+01	1.1E+01	1.1E+01	1.8E+01	N	No	6.20E+00	no	1.5E+01	**Yes**
Metals	Barium	mg/kg	7440-39-3	1.1E+02	2.1E+02	2.7E+02	L	1.1E+02	1.4E+02	1.4E+02	4.1E+02	L	No	1.02E+00	no	8.8E+01	no
Metals	Beryllium	mg/kg	7440-41-7	8.4E-01	1.3E+00	2.1E+00	D	7.4E-01	9.7E-01	9.7E-01	3.4E+00	X	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	8.8E-01	no
Metals	Cadmium	mg/kg	7440-43-9	1.9E+00	1.9E+01	9.1E+00	L	3.2E+00	6.5E+00	6.5E+00	4.8E+01	L	No	4.50E+01	no		no
Metals	Calcium	mg/kg	7440-70-2	2.2E+04	3.3E+04	5.3E+04	N	2.8E+04	4.0E+04	4.0E+04	1.6E+05	X	No	No HQ	no HQ at LL 1 because no TRVs	1.6E+04	no
Metals	Chromium	mg/kg	7440-47-3	1.2E+01	1.8E+01	3.0E+01	L	2.5E+01	3.5E+01	3.5E+01	3.1E+02	X	No	8.80E+01	no	1.7E+01	no
Metals	Cobalt	mg/kg	7440-48-4	5.4E+00	6.8E+00	8.5E+00	L	8.7E+00	1.0E+01	1.0E+01	3.2E+01	L	No	5.00E-01	**Yes**	1.0E+01	**NA**
Metals	Copper	mg/kg	7440-50-8	2.5E+01	3.9E+01	5.6E+01	L	1.1E+02	1.9E+02	1.9E+02	2.4E+03	X	No	3.00E+00	no	1.8E+01	no
Metals	Iron	mg/kg	7439-89-6	1.8E+04	2.7E+04	3.8E+04	L	2.0E+04	2.3E+04	2.3E+04	5.8E+04	L	No	2.26E+03	no	2.3E+04	no
Metals	Lead	mg/kg	7439-92-1	9.6E+01	1.8E+02	5.0E+02	X	1.7E+02	2.5E+02	2.5E+02	1.8E+03	X	No	4.12E+02	no	2.6E+01	no
Metals	Magnesium	mg/kg	7439-95-4	5.0E+03	1.3E+04	1.3E+04	L	5.1E+03	6.5E+03	6.5E+03	2.0E+04	X	No	No HQ	no HQ at LL 1 because no TRVs	3.0E+03	no
Metals	Manganese	mg/kg	7439-96-5	6.6E+02	1.4E+03	1.9E+03	L	1.0E+03	1.3E+03	1.3E+03	3.7E+03	L	No	2.60E+00	no	1.5E+03	no
Metals	Mercury	mg/kg	7487-94-6	2.8E-02	5.4E-02	7.8E-02	L	7.1E-02	9.1E-02	9.1E-02	4.1E-01	L	No	1.50E+00	no	3.6E-02	no
Metals	Nickel	mg/kg	7440-02-0	1.4E+01	1.8E+01	2.6E+01	L	1.8E+01	2.1E+01	2.1E+01	6.2E+01	X	No	7.00E-01	**Yes**	2.1E+01	NA
Metals	Potassium	mg/kg	7440-09-7	6.7E+02	9.6E+02	1.4E+03	L	1.1E+03	1.3E+03	1.3E+03	3.6E+03	L	No	No HQ	no HQ at LL 1 because no TRVs	9.3E+02	no
Metals	Sodium	mg/kg	7440-23-5	2.9E+02	3.7E+02	3.3E+02	N	3.2E+02	3.8E+02	3.8E+02	1.4E+03	X	No	No HQ	no HQ at LL 1 because no TRVs	1.2E+02	no

Appendix Table R-6. LL4 Analytes Whose Means Do Not Exceed LL1 Exposure Concentrations, Plus Maximum LL1 HQs and Comparison of LL4 Maximum Detect to Background

Analysis Type	Analyte	Units	CAS Number	LL4 Mean	LL4 95% UCL of Mean	LL4 Max. Detect	LL4 Dist.	LL1 Mean	LL1 95% UCL of Mean	LL1 Exp. Conc.	LL1 Max. Detect	LL1 Dist.	Is LL4 Mea > LL1 Exp. Conc?	Maximum LL 1 HQ From SERA	Is Max LL 1 HQ < 1 (i.e., LL 4 SRC is NFA)'	Bkg. Criteria	Is LL 4 SRC Max. Det. < Bkg (i.e., NFA)?
Metals	Thallium	mg/kg	6533-73-9	3.1E-01	3.9E-01	5.8E-01	N	4.5E-01	4.9E-01	4.9E-01	7.8E-01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Metals	Vanadium	mg/kg	7440-62-2	1.1E+01	1.7E+01	2.4E+01	L	1.5E+01	1.7E+01	1.7E+01	3.8E+01	L	No	8.40E+00	no	3.1E+01	**Yes**
Metals	Zinc	mg/kg	7440-66-6	2.3E+02	5.7E+02	8.4E+02	L	3.4E+02	4.6E+02	4.6E+02	2.1E+03	X	No	3.42E+02	no	6.2E+01	no
Organics-Explosives	Nitrocellulose	mg/kg	9004-70-0	9.0E+00		9.0E+00	X	1.1E+01	1.8E+01	1.8E+01	1.0E+02	D	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Pesticide/PCB	4,4'-DDE	mg/kg	72-55-9	3.8E-02		3.8E-02	X	2.9E-02	2.6E+03	8.2E-02	8.2E-02	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Organics-Pesticide/PCB	gamma-Chlordane	mg/kg	5103-74-2	1.1E-02		1.1E-02	X	1.0E-02	2.1E-02	2.1E-02	3.5E-02	D	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Pesticide/PCB	PCB-1254	mg/kg	11097-69-1	2.2E-01	3.8E-01	7.5E-01	D	8.6E-01	1.7E+00	1.7E+00	2.4E+00	N	No	1.79E+02	no		no
Organics-Pesticide/PCB	PCB-1260	mg/kg	11096-82-5	1.6E-01	3.9E-01	1.3E+00	D	1.1E-01	1.9E-01	1.9E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Organics-Semivolatile	Benz(a)anthracene	mg/kg	56-55-3	6.8E-02	2.3E-01	9.3E-02	N	1.8E-01	5.9E-01	4.1E-01	4.1E-01	L	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Semivolatile	Benzo(a)pyrene	mg/kg	50-32-8	6.5E-02	2.9E-01	1.0E-01	N	1.8E-01	4.3E-01	3.7E-01	3.7E-01	L	No	3.00E-02	**Yes**		NA
Organics-Semivolatile	Benzo(b)fluoranthene	mg/kg	205-99-2	1.2E-01	2.1E-01	1.3E-01	N	2.1E-01	4.5E-01	4.5E-01	4.7E-01	L	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Semivolatile	Benzo(ghi)perylene	mg/kg	191-24-2	8.3E-02	1.9E-01	1.0E-01	N	1.6E-01	2.1E-01	2.1E-01	2.4E-01	N	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Semivolatile	Benzo(k)fluoranthene	mg/kg	207-08-9	6.9E-02	1.4E-01	8.0E-02	N	1.9E-01	2.0E-01	2.0E-01	2.1E-01	D	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Semivolatile	Bis(2-ethylhexyl)phthalate	mg/kg	117-81-7	1.1E-01	3.1E-01	7.8E-02	N	1.9E-01	2.0E-01	2.0E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Organics-Semivolatile	Chrysene	mg/kg	218-01-9	1.1E-01	2.8E-01	1.4E-01	N	2.0E-01	6.0E-01	4.8E-01	4.8E-01	L	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Semivolatile	Fluoranthene	mg/kg	206-44-0	2.1E-01	7.2E-01	2.9E-01	N	3.0E-01	5.8E-01	5.8E-01	1.0E+00	X	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Semivolatile	Phenanthrene	mg/kg	85-01-8	1.1E-01	5.1E-01	1.7E-01	N	2.2E-01	3.2E-01	3.2E-01	4.5E-01	D	No	No HQ	no HQ at LL 1 because no TRVs		no
Organics-Semivolatile	Pyrene	mg/kg	129-00-0	2.5E-01	7.2E-01	1.8E-01	N	2.6E-01	9.8E-01	7.9E-01	7.9E-01	L	No	8.40E-05	**Yes**		NA
Organics-Volatile	Toluene	mg/kg	108-88-3	2.5E-03	3.9E-03	1.6E-03	D	3.1E-03	3.7E-03	3.7E-03	4.4E-03	D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Perimeter Area Aggregate																	
Metals	Aluminum	mg/kg	7429-90-5	1.1E+04	1.1E+04	1.5E+04	N	1.3E+04	1.4E+04	1.4E+04	2.1E+04	L	No	6.91E+02	no	1.8E+04	**Yes**
Metals	Arsenic	mg/kg	7440-38-2	8.1E+00	8.9E+00	1.2E+01	N	1.1E+01	1.3E+01	1.3E+01	2.5E+01	L	No	7.00E+00	no	1.5E+01	**Yes**
Metals	Barium	mg/kg	7440-39-3	5.7E+01	6.5E+01	1.1E+02	L	8.3E+01	9.2E+01	9.2E+01	1.4E+02	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	8.8E+01	no
Metals	Beryllium	mg/kg	7440-41-7	4.1E-01	5.4E-01	1.5E+00	D	4.3E-01	5.0E-01	5.0E-01	8.2E-01	N	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	8.8E-01	no
Metals	Cadmium	mg/kg	7440-43-9	2.3E-01	2.8E-01	5.4E-01	N	2.4E-01	2.7E-01	2.7E-01	3.2E-01	D	No	2.00E+00	no		no
Metals	Cobalt	mg/kg	7440-48-4	6.8E+00	8.0E+00	1.5E+01	N	9.8E+00	1.1E+01	1.1E+01	2.1E+01	L	No	6.00E-01	**Yes**	1.0E+01	NA

Appendix Table R-6. LL4 Analytes Whose Means Do Not Exceed LL1 Exposure Concentrations, Plus Maximum LL1 HQs and Comparison of LL4 Maximum Detect to Background

Analysis Type	Analyte	Units	CAS Number	LL4 Mean	LL4 95% UCL of Mean	LL4 Max. Detect	LL4 Dist.	LL1 Mean	LL1 95% UCL of Mean	LL1 Exp. Conc.	LL1 Max. Detect	LL1 Dist.	Is LL4 Mea > LL1 Exp. Conc?	Maximum LL 1 HQ From SERA	Is Max LL 1 HQ < 1 (i.e., LL 4 SRC is NFA)'	Bkg. Criteria	Is LL 4 SRC Max. Det. < Bkg (i.e., NFA)?
Metals	Copper	mg/kg	7440-50-8	1.1E+01	1.2E+01	1.6E+01	N	1.1E+01	1.2E+01	1.2E+01	2.0E+01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	1.8E+01	**Yes**
Metals	Iron	mg/kg	7439-89-6	1.6E+04	1.8E+04	2.4E+04	N	2.2E+04	2.4E+04	2.4E+04	3.3E+04	L	No	2.40E+03	no	2.3E+04	no
Metals	Manganese	mg/kg	7439-96-5	4.3E+02	6.6E+02	1.8E+03	L	9.2E+02	1.4E+03	1.4E+03	2.3E+03	L	No	3.00E+00	no	1.5E+03	no
Metals	Mercury	mg/kg	7487-94-6	4.4E-02	5.2E-02	9.4E-02	N	5.4E-02	6.1E-02	6.1E-02	9.3E-02	N	No	2.00E-01	**Yes**	3.6E-02	NA
Metals	Nickel	mg/kg	7440-02-0	1.2E+01	1.4E+01	1.9E+01	N	1.5E+01	1.6E+01	1.6E+01	2.3E+01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	2.1E+01	**Yes**
Metals	Potassium	mg/kg	7440-09-7	6.5E+02	7.3E+02	1.0E+03	N	8.9E+02	1.0E+03	1.0E+03	1.5E+03	L	No	No HQ	no HQ at LL 1 because no TRVs	9.3E+02	no
Metals	Selenium	mg/kg	7782-49-2	7.7E-01	9.1E-01	1.2E+00	N	6.4E-01	7.9E-01	7.9E-01	1.7E+00	X	No	1.20E+00	no	1.4E+00	**Yes**
Metals	Sodium	mg/kg	7440-23-5	2.9E+02	3.5E+02	1.7E+02	D	2.9E+02	3.1E+02	3.1E+02		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	1.2E+02	no
Metals	Thallium	mg/kg	6533-73-9	4.3E-01	4.9E-01	6.7E-01	N	6.0E-01	6.4E-01	6.4E-01	8.6E-01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Metals	Vanadium	mg/kg	7440-62-2	1.6E+01	1.8E+01	2.3E+01	N	2.7E+01	2.9E+01	2.9E+01	4.6E+01	L	No	1.40E+01	no	3.1E+01	**Yes**
Metals	Zinc	mg/kg	7440-66-6	5.7E+01	6.8E+01	1.2E+02	L	5.8E+01	6.2E+01	6.2E+01	7.8E+01	N	No	4.60E+01	no	6.2E+01	no
Organics-Semivolatile	Benz(a)anthracene	mg/kg	56-55-3	1.7E-01	2.6E-01	1.1E-01	D	2.0E-01	2.4E-01	2.4E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Organics-Semivolatile	Benzo(ghi)perylene	mg/kg	191-24-2	1.7E-01	2.8E-01	1.2E-01	D	2.0E-01	2.4E-01	2.4E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Organics-Semivolatile	Benzo(k)fluoranthene	mg/kg	207-08-9	2.2E-01	3.6E-01	7.8E-02	D	2.0E-01	2.4E-01	2.4E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Organics-Semivolatile	Bis(2-ethylhexyl)phthalate	mg/kg	117-81-7	1.6E-01	2.7E-01	3.1E-01	N	2.0E-01	2.4E-01	2.4E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Organics-Semivolatile	Chrysene	mg/kg	218-01-9	2.4E-01	3.3E-01	1.4E-01	D	2.0E-01	2.4E-01	2.4E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Organics-Semivolatile	Pyrene	mg/kg	129-00-0	2.2E-01	3.0E-01	1.6E-01	D	2.0E-01	2.4E-01	2.4E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Organics-Volatile	Toluene	mg/kg	108-88-3	3.0E-03	4.9E-03	6.2E-04	D	3.0E-03	3.8E-03	3.8E-03		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Melt-Pour Area Drainage Ditches Aggregate																	
Metals	Aluminum	mg/kg	7429-90-5	6.6E+03	8.3E+03	1.3E+04	L	1.3E+04	1.4E+04	1.4E+04	2.1E+04	L	No	6.91E+02	no	1.8E+04	**Yes**
Metals	Arsenic	mg/kg	7440-38-2	9.1E+00	1.1E+01	1.6E+01	N	1.1E+01	1.3E+01	1.3E+01	2.5E+01	L	No	7.00E+00	no	1.5E+01	no

Appendix Table R-6. LL4 Analytes Whose Means Do Not Exceed LL1 Exposure Concentrations, Plus Maximum LL1 HQs and Comparison of LL4 Maximum Detect to Background

Analysis Type	Analyte	Units	CAS Number	LL4 Mean	LL4 95% UCL of Mean	LL4 Max. Detect	LL4 Dist.	LL1 Mean	LL1 95% UCL of Mean	LL1 Exp. Conc.	LL1 Max. Detect	LL1 Dist.	Is LL4 Mea > LL1 Exp. Conc?	Maximum LL 1 HQ From SERA	Is Max LL 1 HQ < 1 (i.e., LL 4 SRC is NFA)'	Bkg. Criteria	Is LL 4 SRC Max. Det. < Bkg (i.e., NFA)?
Metals	Barium	mg/kg	7440-39-3	4.6E+01	5.5E+01	8.4E+01	N	8.3E+01	9.2E+01	9.2E+01	1.4E+02	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	8.8E+01	Yes
Metals	Beryllium	mg/kg	7440-41-7	3.5E-01	4.3E-01	4.5E-01	N	4.3E-01	5.0E-01	5.0E-01	8.2E-01	N	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	8.8E-01	**Yes**
Metals	Cadmium	mg/kg	7440-43-9	1.5E-01	2.0E-01	3.2E-01	N	2.4E-01	2.7E-01	2.7E-01	3.2E-01	D	No	1.90E+00	no		no
Metals	Chromium	mg/kg	7440-47-3	9.5E+00	1.1E+01	1.7E+01	L	1.6E+01	1.7E+01	1.7E+01	2.5E+01	L	No	4.20E+01	no	1.7E+01	**no**
Metals	Cobalt	mg/kg	7440-48-4	7.4E+00	9.0E+00	9.9E+00	N	9.8E+00	1.1E+01	1.1E+01	2.1E+01	L	No	6.00E-01	**Yes**	1.0E+01	**NA**
Metals	Cyanide	mg/kg	57-12-5	3.7E-01	1.7E+00	1.6E-01	N	4.3E-01	5.6E-01	5.6E-01	1.7E+00	D	No	9.00E-04	**Yes**		NA
Metals	Iron	mg/kg	7439-89-6	1.7E+04	2.2E+04	2.6E+04	N	2.2E+04	2.4E+04	2.4E+04	3.3E+04	L	No	2.40E+03	no	2.3E+04	no
Metals	Lead	mg/kg	7439-92-1	1.4E+01	1.7E+01	2.7E+01	L	1.9E+01	2.1E+01	2.1E+01	3.5E+01	L	No	3.40E+01	no	2.6E+01	no
Metals	Manganese	mg/kg	7439-96-5	4.2E+02	6.4E+02	8.9E+02	L	9.2E+02	1.4E+03	1.4E+03	2.3E+03	L	No	7.00E-01	**Yes**	1.5E+03	**NA**
Metals	Mercury	mg/kg	7487-94-6	3.6E-02	5.0E-02	2.6E-02	D	5.4E-02	6.1E-02	6.1E-02	9.3E-02	N	No	2.00E-01	**Yes**	3.6E-02	**NA**
Metals	Nickel	mg/kg	7440-02-0	1.5E+01	1.8E+01	1.9E+01	N	1.5E+01	1.6E+01	1.6E+01	2.3E+01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	2.1E+01	**Yes**
Metals	Potassium	mg/kg	7440-09-7	6.2E+02	7.8E+02	8.8E+02	N	8.9E+02	1.0E+03	1.0E+03	1.5E+03	L	No	No HQ	no HQ at LL 1 because no TRVs	9.3E+02	**Yes**
Metals	Selenium	mg/kg	7782-49-2	6.2E-01	8.5E-01	6.0E-01	D	6.4E-01	7.9E-01	7.9E-01	1.7E+00	X	No	1.20E+00	no	1.4E+00	**Yes**
Metals	Sodium	mg/kg	7440-23-5	3.0E+02	4.1E+02	2.0E+02	D	2.9E+02	3.1E+02	3.1E+02		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	1.2E+02	no
Metals	Thallium	mg/kg	6533-73-9	4.5E-01	6.1E-01	7.3E-01	N	6.0E-01	6.4E-01	6.4E-01	8.6E-01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no
Metals	Vanadium	mg/kg	7440-62-2	9.9E+00	1.2E+01	1.3E+01	N	2.7E+01	2.9E+01	2.9E+01	4.6E+01	L	No	1.40E+01	no	3.1E+01	**Yes**
Organics-Volatile	Acetone	mg/kg	67-64-1	4.5E-03	1.6E-02	6.3E-03	N	6.3E-03	7.8E-03	7.8E-03		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen		no

Appendix Table R-7. Summary of LL4 Analytes Whose Means Do Not Exceed LL1 Exposure Concentration and Qualify For NFA Because LL 1 Maximum HQ is < 1, or LL 4 Maximum Detect is < Background

Analysis Type	Analyte	Units	CAS Number	LL4 Mean	LL4 95% UCL of Mean	LL4 Max. Detect	LL4 Dist.	LL1 Mean	LL1 95% UCL of Mean	LL1 Exp. Conc.	LL1 Max. Detect	LL1 Dist.	Is LL4 Mean > LL1 Exp. Conc?	Maximum LL 1 HQ From SERA	s Max LL 1 HQ < 1 (i.e., LL 4 SRC is a NFA)?	Bkg. Criteria	s LL 4 Max. Det. < Bkg. (i.e., LL 4 SRC is a NFA)?
Explosives Handling Areas Aggregate																	
Metals	Antimony	mg/kg	7440-36-0	5.6E-01	6.9E-01	2.2E+00	D	7.0E-01	7.5E-01	7.5E-01	3.0E+00	D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	9.6E-01	no
Metals	Cobalt	mg/kg	7440-48-4	8.7E+00	1.2E+01	7.8E+01	X	8.2E+00	8.9E+00	8.9E+00	4.9E+01	X	No	4.00E-01	**Yes**	1.0E+01	NA
Metals	Cyanide	mg/kg	57-12-5	2.4E-01	3.2E-01	5.1E-01	D	4.6E-01	5.5E-01	5.5E-01	3.8E+00	D	No	6.00E-04	**Yes**		NA
Metals	Nickel	mg/kg	7440-02-0	1.6E+01	1.7E+01	3.2E+01	N	1.6E+01	1.8E+01	1.8E+01	1.0E+02	X	No	6.00E-01	**Yes**	2.1E+01	NA
Metals	Vanadium	mg/kg	7440-62-2	1.4E+01	1.5E+01	2.0E+01	N	1.8E+01	1.9E+01	1.9E+01	7.8E+01	X	No	1.00E+01	no	3.1E+01	**Yes**
Organics-Pesticide/PCB	alpha-Chlordane	mg/kg	5103-71-9	7.2E-03	1.2E-02	3.4E-02	D	3.3E-02	7.8E-02	7.8E-02	4.4E-01	D	No	2.00E-01	**Yes**		NA
Organics-Semivolatile	Benzo(a)pyrene	mg/kg	50-32-8	4.6E-01	7.5E-01	2.7E+00	D	4.1E-01	6.1E-01	6.1E-01	1.0E+00	D	No	5.00E-02	**Yes**		NA
Organics-Semivolatile	Fluorene	mg/kg	86-73-7	2.2E-01	2.7E-01	1.2E-01	D	3.8E-01	5.6E-01	3.1E-01	3.1E-01	D	No	6.00E-03	**Yes**		NA
Organics-Semivolatile	Pyrene	mg/kg	129-00-0	6.8E-01	3.0E+00	5.4E+00	L	5.4E-01	8.3E-01	8.3E-01	2.3E+00	D	No	8.30E-05	**Yes**		NA
Preparation and Receiving Areas Aggregate																	
Metals	Aluminum	mg/kg	7429-90-5	9.0E+03	1.1E+04	1.6E+04	N	9.8E+03	1.2E+04	1.2E+04	2.3E+04	L	No	5.92E+02	no	1.8E+04	**Yes**
Metals	Copper	mg/kg	7440-50-8	4.9E+01	1.0E+02	5.1E+02	X	3.8E+01	5.6E+01	5.6E+01	1.9E+02	L	No	9.00E-01	**Yes**	1.8E+01	NA
Metals	Manganese	mg/kg	7439-96-5	5.4E+02	9.4E+02	1.8E+03	L	9.2E+02	1.3E+03	1.3E+03	4.1E+03	X	No	2.50E+00	**Yes**	1.5E+03	NA
Organics-Semivolatile	Bis(2-ethylhexyl)phthalat	mg/kg	117-81-7	1.2E-01	2.5E-01	6.1E-02	D	6.5E-01	1.6E+00	3.4E-01	3.4E-01	D	No	2.00E-02	**Yes**		NA
Organics-Semivolatile	Pyrene	mg/kg	129-00-0	1.4E-01	2.3E-01	6.9E-02	D	8.7E+00	8.8E+06	4.1E+01	4.1E+01	L	No	4.00E-03	**Yes**		NA
Packaging and Shipping Areas Aggregate																	
Metals	Aluminum	mg/kg	7429-90-5	1.0E+04	1.2E+04	1.5E+04	N	1.1E+04	1.3E+04	1.3E+04	2.6E+04	L	No	6.39E+02	no	1.8E+04	**Yes**
Metals	Antimony	mg/kg	7440-36-0	8.8E-01	1.2E+00	1.5E+00	D	9.5E-01	1.3E+00	1.3E+00	9.1E+00	D	No	9.00E-01	**Yes**	9.6E-01	NA
Metals	Arsenic	mg/kg	7440-38-2	8.3E+00	9.7E+00	1.3E+01	N	1.0E+01	1.1E+01	1.1E+01	1.8E+01	N	No	6.20E+00	no	1.5E+01	**Yes**
Metals	Cobalt	mg/kg	7440-48-4	5.4E+00	6.8E+00	8.5E+00	L	8.7E+00	1.0E+01	1.0E+01	3.2E+01	L	No	5.00E-01	**Yes**	1.0E+01	NA
Metals	Nickel	mg/kg	7440-02-0	1.4E+01	1.8E+01	2.6E+01	L	1.8E+01	2.1E+01	2.1E+01	6.2E+01	X	No	7.00E-01	**Yes**	2.1E+01	NA
Metals	Vanadium	mg/kg	7440-62-2	1.1E+01	1.7E+01	2.4E+01	L	1.5E+01	1.7E+01	1.7E+01	3.8E+01	L	No	8.40E+00	no	3.1E+01	**Yes**
Organics-Semivolatile	Benzo(a)pyrene	mg/kg	50-32-8	6.5E-02	2.9E-01	1.0E-01	N	1.8E-01	4.3E-01	3.7E-01	3.7E-01	L	No	3.00E-02	**Yes**		NA
Organics-Semivolatile	Pyrene	mg/kg	129-00-0	2.5E-01	7.2E-01	1.8E-01	N	2.6E-01	9.8E-01	7.9E-01	7.9E-01	L	No	8.40E-05	**Yes**		NA
Perimeter Area Aggregate																	
Metals	Aluminum	mg/kg	7429-90-5	1.1E+04	1.1E+04	1.5E+04	N	1.3E+04	1.4E+04	1.4E+04	2.1E+04	L	No	6.91E+02	no	1.8E+04	**Yes**
Metals	Arsenic	mg/kg	7440-38-2	8.1E+00	8.9E+00	1.2E+01	N	1.1E+01	1.3E+01	1.3E+01	2.5E+01	L	No	7.00E+00	no	1.5E+01	**Yes**
Metals	Cobalt	mg/kg	7440-48-4	6.8E+00	8.0E+00	1.5E+01	N	9.8E+00	1.1E+01	1.1E+01	2.1E+01	L	No	6.00E-01	**Yes**	1.0E+01	NA
Metals	Copper	mg/kg	7440-50-8	1.1E+01	1.2E+01	1.6E+01	N	1.1E+01	1.2E+01	1.2E+01	2.0E+01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	1.8E+01	**Yes**
Metals	Mercury	mg/kg	7487-94-6	4.4E-02	5.2E-02	9.4E-02	N	5.4E-02	6.1E-02	6.1E-02	9.3E-02	N	No	2.00E-01	**Yes**	3.6E-02	NA
Metals	Nickel	mg/kg	7440-02-0	1.2E+01	1.4E+01	1.9E+01	N	1.5E+01	1.6E+01	1.6E+01	2.3E+01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	2.1E+01	**Yes**
Metals	Selenium	mg/kg	7782-49-2	7.7E-01	9.1E-01	1.2E+00	N	6.4E-01	7.9E-01	7.9E-01	1.7E+00	X	No	1.20E+00	no	1.4E+00	**Yes**
Metals	Vanadium	mg/kg	7440-62-2	1.6E+01	1.8E+01	2.3E+01	N	2.7E+01	2.9E+01	2.9E+01	4.6E+01	L	No	1.40E+01	no	3.1E+01	**Yes**
Melt-Pour Area Drainage Ditches Aggregate																	
Metals	Aluminum	mg/kg	7429-90-5	6.6E+03	8.3E+03	1.3E+04	L	1.3E+04	1.4E+04	1.4E+04	2.1E+04	L	No	6.91E+02	no	1.8E+04	**Yes**
Metals	Beryllium	mg/kg	7440-41-7	3.5E-01	4.3E-01	4.5E-01	N	4.3E-01	5.0E-01	5.0E-01	8.2E-01	N	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	8.8E-01	**Yes**
Metals	Chromium	mg/kg	7440-47-3	9.5E+00	1.1E+01	1.7E+01	L	1.6E+01	1.7E+01	1.7E+01	2.5E+01	L	No	4.20E+01	no	1.7E+01	no
Metals	Cobalt	mg/kg	7440-48-4	7.4E+00	9.0E+00	9.9E+00	N	9.8E+00	1.1E+01	1.1E+01	2.1E+01	L	No	6.00E-01	**Yes**	1.0E+01	NA
Metals	Cyanide	mg/kg	57-12-5	3.7E-01	1.7E+00	1.6E-01	N	4.3E-01	5.6E-01	5.6E-01	1.7E+00	D	No	9.00E-04	**Yes**		NA
Metals	Manganese	mg/kg	7439-96-5	4.2E+02	6.4E+02	8.9E+02	L	9.2E+02	1.4E+03	1.4E+03	2.3E+03	L	No	7.00E-01	**Yes**	1.5E+03	NA
Metals	Mercury	mg/kg	7487-94-6	3.6E-02	5.0E-02	2.6E-02	D	5.4E-02	6.1E-02	6.1E-02	9.3E-02	N	No	2.00E-01	**Yes**	3.6E-02	NA

Appendix Table R-7. Summary of LL4 Analytes Whose Means Do Not Exceed LL1 Exposure Concentration and Qualify For NFA Because LL 1 Maximum HQ is < 1, or LL 4 Maximum Detect is < Background

					LL4	LL4			LL1	LL1	LL1	Is LL4 Mean		Maximum	s Max LL 1 HQ		s LL 4 Max. Det.	
Analysis			**CAS**	**LL4**	**95% UCL**	**Max.**	**LL4**	**LL1**	**95% UCL**	**Exp.**	**Max.**	**LL1**	**> LL1 Exp.**	**LL 1 HQ**	**< 1 (i.e., LL 4**	**Bkg.**	**< Bkg. (i.e., LL 4**	
Type	**Analyte**	**Units**	**Number**	**Mean**	**of Mean**	**Detect**	**Dist.**	**Mean**	**of Mean**	**Conc.**	**Detect**	**Dist.**	**Conc?**	**From SERA**	**SRC is a NFA)?**	**Criteria**	**SRC is a NFA)?**	
Metals	Nickel	mg/kg	7440-02-0	1.5E+01	1.8E+01	1.9E+01	N	1.5E+01	1.6E+01	1.6E+01	2.3E+01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen	2.1E+01	**Yes**	
Metals	Potassium	mg/kg	7440-09-7	6.2E+02	7.8E+02	8.8E+02	N	8.9E+02	1.0E+03	1.0E+03	1.5E+03	L	No	No HQ	no HQ at LL 1 because no TRVs	9.3E+02	**Yes**	
Metals	Selenium	mg/kg	7782-49-2	6.2E-01	8.5E-01	6.0E-01	D	6.4E-01	7.9E-01	7.9E-01	1.7E+00	X	No	1.20E+00	no	1.4E+00	**Yes**	
Metals	Vanadium	mg/kg	7440-62-2	9.9E+00	1.2E+01	1.3E+01	N	2.7E+01	2.9E+01	2.9E+01	4.6E+01	L	No	1.40E+01	no	3.1E+01	**Yes**	
95% UCL = 95 percent upper confidence level																		
Max. = maximum																		
HQ = hazard quotient																		
SERA = screening ecological risk assessment																		
NFA = no further action																		
SRC = site-related chemical																		
NA = not applicable because the SRC was already NFA per the LL 1 max HQ < 1																		

Appendix Table R-8. Summary of LL4 Analytes Whose Means Do Not Exceed LL1 Exposure Concentrations and Do Not Require ESV Screening Because They Were Eliminated During LL 1 ESV Prescreening

Analysis Type	Analyte	Units	CAS Registry Number	LL4 Mean	LL4 95% UCL of Mean	LL4 Max. Detect	LL4 Dist.	LL1 Mean	LL1 95% UCL of Mean	LL1 Exp. Conc.	LL1 Max. Detect	Is LL4 Mean LL1 Dist.	Is LL4 Mean > LL1 Exp. Conc?	Maximum LL 1 HQ From SERA	Is Max LL 1 HQ < 1 (i.e., LL 4 Analyte is NFA)?
Explosives Handling Areas Aggregate															
Metals	Antimony	mg/kg	7440-36-0	5.6E-01	6.9E-01	2.2E+00	D	7.0E-01	7.5E-01	7.5E-01	3.0E+00	D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Pesticide/PCB	4,4'-DDD	mg/kg	72-54-8	8.4E-03	1.8E-02	1.0E-01	D	1.9E-02	3.9E-02	3.9E-02		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Pesticide/PCB	Endosulfan II	mg/kg	33213-65-9	5.2E-03	9.1E-03	3.7E-02	D	1.9E-02	3.9E-02	3.9E-02		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Pesticide/PCB	Endrin	mg/kg	72-20-8	5.2E-03	7.3E-03	1.8E-02	D	1.9E-02	3.9E-02	3.9E-02		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Pesticide/PCB	PCB-1260	mg/kg	11096-82-5	1.5E+00	2.9E+00	2.8E+01	D	2.4E+00	6.3E+00	6.3E+00		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Semivolatile	Acenaphthylene	mg/kg	208-96-8	3.0E-01	3.8E-01	5.6E-01	D	3.7E-01	5.5E-01	5.5E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Semivolatile	Di-n-butyl phthalate	mg/kg	84-74-2	3.0E-01	4.0E-01	9.2E-01	D	3.7E-01	5.5E-01	5.5E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Volatile	Chloroform	mg/kg	67-66-3	3.1E-03	3.9E-03	2.0E-03	D	3.1E-03	3.4E-03	3.4E-03		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Volatile	Toluene	mg/kg	108-88-3	2.7E-03	3.8E-03	1.2E-02	D	3.1E-03	3.4E-03	3.4E-03		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Preparation and Receiving Areas Aggregate															
Metals	Beryllium	mg/kg	7440-41-7	5.4E-01	8.8E-01	1.6E+00	L	5.6E-01	9.5E-01	9.5E-01	2.5E+00	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Metals	Cobalt	mg/kg	7440-48-4	6.1E+00	7.7E+00	1.4E+01	L	7.5E+00	8.2E+00	8.2E+00	1.1E+01	N	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Metals	Cyanide	mg/kg	57-12-5	1.1E-01		1.1E-01	X	4.0E-01	5.5E-01	5.5E-01	1.0E+00	D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Metals	Thallium	mg/kg	6533-73-9	5.3E-01	6.5E-01	1.2E+00	N	5.6E-01	6.0E-01	6.0E-01	8.0E-01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Metals	Vanadium	mg/kg	7440-62-2	1.4E+01	1.9E+01	4.1E+01	L	1.5E+01	1.8E+01	1.8E+01	2.7E+01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen

Appendix Table R-8. Summary of LL4 Analytes Whose Means Do Not Exceed LL1 Exposure Concentrations and Do Not Require ESV Screening Because They Were Eliminated During LL 1 ESV Prescreening

					LL4	LL4			LL1	LL1	LL1	Is LL4 Mean		Maximum	Is Max LL 1
Analysis			**CAS Registry**	**LL4**	**95% UCL**	**Max.**	**LL4**	**LL1**	**95% UCL**	**Exp.**	**Max.**	**LL1**	**> LL1 Exp.**	**LL 1 HQ**	**HQ < 1 (i.e., LL 4**
Type	**Analyte**	**Units**	**Number**	**Mean**	**of Mean**	**Detect**	**Dist.**	**Mean**	**of Mean**	**Conc.**	**Detect**	**Dist.**	**Conc?**	**From SERA**	**Analyte is NFA)?**
Organics-Volatile	Toluene	mg/kg	108-88-3	2.3E-03	8.0E-02	5.1E-03	L	2.9E-03	3.0E-03	3.0E-03		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Packaging and Shipping Areas Aggregate															
Metals	Beryllium	mg/kg	7440-41-7	8.4E-01	1.3E+00	2.1E+00	D	7.4E-01	9.7E-01	9.7E-01	3.4E+00	X	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Metals	Thallium	mg/kg	6533-73-9	3.1E-01	3.9E-01	5.8E-01	N	4.5E-01	4.9E-01	4.9E-01	7.8E-01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Pesticide/PCB	4,4'-DDE	mg/kg	72-55-9	3.8E-02		3.8E-02	X	2.9E-02	2.6E+03	8.2E-02	8.2E-02	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Pesticide/PCB	PCB-1260	mg/kg	11096-82-5	1.6E-01	3.9E-01	1.3E+00	D	1.1E-01	1.9E-01	1.9E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Semivolatile	Bis(2-ethylhexyl)phthalate	mg/kg	117-81-7	1.1E-01	3.1E-01	7.8E-02	N	1.9E-01	2.0E-01	2.0E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Volatile	Toluene	mg/kg	108-88-3	2.5E-03	3.9E-03	1.6E-03	D	3.1E-03	3.7E-03	3.7E-03	4.4E-03	D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Perimeter Area Aggregate															
Metals	Barium	mg/kg	7440-39-3	5.7E+01	6.5E+01	1.1E+02	L	8.3E+01	9.2E+01	9.2E+01	1.4E+02	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Metals	Beryllium	mg/kg	7440-41-7	4.1E-01	5.4E-01	1.5E+00	D	4.3E-01	5.0E-01	5.0E-01	8.2E-01	N	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Metals	Copper	mg/kg	7440-50-8	1.1E+01	1.2E+01	1.6E+01	N	1.1E+01	1.2E+01	1.2E+01	2.0E+01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Metals	Sodium	mg/kg	7440-23-5	2.9E+02	3.5E+02	1.7E+02	D	2.9E+02	3.1E+02	3.1E+02		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Metals	Thallium	mg/kg	6533-73-9	4.3E-01	4.9E-01	6.7E-01	N	6.0E-01	6.4E-01	6.4E-01	8.6E-01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Semivolatile	Benz(a)anthracene	mg/kg	56-55-3	1.7E-01	2.6E-01	1.1E-01	D	2.0E-01	2.4E-01	2.4E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Semivolatile	Benzo(ghi)perylene	mg/kg	191-24-2	1.7E-01	2.8E-01	1.2E-01	D	2.0E-01	2.4E-01	2.4E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen

Appendix Table R-8. Summary of LL4 Analytes Whose Means Do Not Exceed LL1 Exposure Concentrations and Do Not Require ESV Screening Because They Were Eliminated During LL 1 ESV Prescreening

Analysis Type	Analyte	Units	CAS Registry Number	LL4 Mean	LL4 95% UCL of Mean	LL4 Max. Detect	LL4 Dist.	LL1 Mean	LL1 95% UCL of Mean	LL1 Exp. Conc.	LL1 Max. Detect	Is LL4 Mean LL1 Dist.	Is LL4 Mean > LL1 Exp. Conc?	Maximum LL 1 HQ From SERA	Is Max LL 1 HQ < 1 (i.e., LL 4 Analyte is NFA)?
Organics-Semivolatile	Benzo(k)fluoranthene	mg/kg	207-08-9	2.2E-01	3.6E-01	7.8E-02	D	2.0E-01	2.4E-01	2.4E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Semivolatile	Bis(2-ethylhexyl)phthalate	mg/kg	117-81-7	1.6E-01	2.7E-01	3.1E-01	N	2.0E-01	2.4E-01	2.4E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Semivolatile	Chrysene	mg/kg	218-01-9	2.4E-01	3.3E-01	1.4E-01	D	2.0E-01	2.4E-01	2.4E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Semivolatile	Pyrene	mg/kg	129-00-0	2.2E-01	3.0E-01	1.6E-01	D	2.0E-01	2.4E-01	2.4E-01		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Volatile	Toluene	mg/kg	108-88-3	3.0E-03	4.9E-03	6.2E-04	D	3.0E-03	3.8E-03	3.8E-03		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Melt-Pour Area Drainage Ditches Aggregate															
Metals	Barium	mg/kg	7440-39-3	4.6E+01	5.5E+01	8.4E+01	N	8.3E+01	9.2E+01	9.2E+01	1.4E+02	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Metals	Sodium	mg/kg	7440-23-5	3.0E+02	4.1E+02	2.0E+02	D	2.9E+02	3.1E+02	3.1E+02		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Metals	Thallium	mg/kg	6533-73-9	4.5E-01	6.1E-01	7.3E-01	N	6.0E-01	6.4E-01	6.4E-01	8.6E-01	L	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen
Organics-Volatile	Acetone	mg/kg	67-64-1	4.5E-03	1.6E-02	6.3E-03	N	6.3E-03	7.8E-03	7.8E-03		D	No	--	no HQ; SRC at LL 1 was eliminated during ESV prescreen

CAS = Chemical Abstract Service
UCL = Upper Confidence Level
Max. = Maximum
Dist. = distribution
Exp. Conc. = exposure concentration
HQ = hazard quotient
SERA = screening ecological risk assessment
NFA = no further analysis
Bkg. = background

Appendix Table R-9. Summary of LL4 Analytes Whose Means Do Not Exceed LL1 Exposure Concentrations Qualify For NFA Because They Had no LL 1 HQs Due to Absence of TRVs

Analysis Type	Analyte	Units	CAS Registr Number	LL4 Mean	LL4 95% UCL of Mean	LL4 Max. Detect	LL4 Dist.	LL1 Mean	LL1 95% UCL of Mean	LL1 Exp. Conc.	LL1 Max. Detect	LL1 Dist.	Is LL4 Mean > LL1 Exp. Conc?	Maximum LL 1 HQ From SERA	Is Max LL 1 HQ < 1 (i.e., LL 4 analyte is NFA)?
Explosives Handling Areas Aggregate															
Metals	Potassium	mg/kg	7440-09-7	8.9E+02	1.0E+03	2.3E+03	L	9.3E+02	1.0E+03	1.0E+03	5.7E+03	X	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Explosives	2,4,6-Trinitrotoluene	mg/kg	118-96-7	2.3E-01	3.2E-01	2.2E+00	D	1.6E+02	3.0E+02	3.0E+02	4.8E+03	X	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Explosives	HMX	mg/kg	2691-41-0	1.0E+00	1.2E+00	3.6E+00	D	8.4E+00	1.6E+01	1.6E+01	2.6E+02	D	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Explosives	RDX	mg/kg	121-82-4	8.0E-01	1.4E+00	1.9E+01	D	4.8E+01	1.0E+02	1.0E+02	2.3E+03	D	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Pesticide/PCB	4,4'-DDE	mg/kg	72-55-9	7.6E-03	1.3E-02	4.9E-02	D	5.1E-01	1.2E+00	1.2E+00	6.7E+00	X	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Pesticide/PCB	Endrin aldehyde	mg/kg	7421-93-4	5.6E-02	1.4E-01	8.4E-01	D	3.1E-01	6.4E+00	4.4E+00	4.4E+00	L	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Pesticide/PCB	Endrin ketone	mg/kg	53494-70-5	3.0E-03	4.4E-03	1.1E-02	D	1.9E-02	3.9E-02	1.4E-02	1.4E-02	D	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Pesticide/PCB	gamma-Chlordane	mg/kg	5103-74-2	9.4E-03	1.8E-02	8.3E-02	D	3.5E-01	8.9E-01	8.9E-01	5.3E+00	D	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Pesticide/PCB	Heptachlor	mg/kg	76-44-8	4.1E-02	1.1E-01	6.7E-01	D	3.5E-02	7.2E-02	7.2E-02	3.2E-01	D	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Pesticide/PCB	Heptachlor epoxide	mg/kg	1024-57-3	4.5E-03	9.8E-03	5.2E-02	D	2.0E-02	4.0E-02	3.1E-02	3.1E-02	D	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Semivolatile	Anthracene	mg/kg	120-12-7	3.5E-01	4.7E-01	1.2E+00	D	3.6E-01	5.4E-01	5.4E-01	5.5E-01	D	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Semivolatile	Benz(a)anthracene	mg/kg	56-55-3	4.5E-01	6.7E-01	2.1E+00	D	4.3E-01	6.4E-01	6.4E-01	1.2E+00	D	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Semivolatile	Carbazole	mg/kg	86-74-8	2.9E-01	4.2E-01	1.4E+00	D	3.8E-01	5.6E-01	3.8E-01	3.8E-01	D	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Semivolatile	Fluoranthene	mg/kg	206-44-0	8.2E-01	3.1E+00	8.1E+00	L	5.5E-01	9.1E-01	9.1E-01	2.9E+00	D	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Semivolatile	Phenanthrene	mg/kg	85-01-8	4.2E-01	6.1E-01	2.3E+00	D	4.9E-01	7.7E-01	7.7E-01	2.5E+00	D	No	No HQ	no HQ at LL 1 because no TRVs
Preparation and Receiving Areas Aggregate															
Metals	Calcium	mg/kg	7440-70-2	3.6E+04	1.8E+05	1.7E+05	L	3.1E+04	2.0E+05	2.0E+05	2.2E+05	L	No	No HQ	no HQ at LL 1 because no TRVs
Metals	Magnesium	mg/kg	7439-95-4	3.7E+03	5.4E+03	8.8E+03	L	4.1E+03	5.5E+03	5.5E+03	1.7E+04	X	No	No HQ	no HQ at LL 1 because no TRVs
Metals	Potassium	mg/kg	7440-09-7	6.5E+02	7.8E+02	1.2E+03	L	1.1E+03	1.2E+03	1.2E+03	1.8E+03	L	No	No HQ	no HQ at LL 1 because no TRVs
Metals	Sodium	mg/kg	7440-23-5	2.3E+02	3.0E+02	1.8E+02	D	2.3E+02	3.0E+02	3.0E+02	9.3E+02	D	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Semivolatile	Fluoranthene	mg/kg	206-44-0	8.6E-02	1.8E-01	7.0E-02	D	8.4E+00	7.0E+06	3.9E+01	3.9E+01	L	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Semivolatile	Phenanthrene	mg/kg	85-01-8	2.5E-01	3.8E-01	6.0E-02	D	6.3E+00	8.0E+06	3.0E+01	3.0E+01	L	No	No HQ	no HQ at LL 1 because no TRVs
Packaging and Shipping Areas Aggregate															
Metals	Calcium	mg/kg	7440-70-2	2.2E+04	3.3E+04	5.3E+04	N	2.8E+04	4.0E+04	4.0E+04	1.6E+05	X	No	No HQ	no HQ at LL 1 because no TRVs
Metals	Magnesium	mg/kg	7439-95-4	5.0E+03	1.3E+04	1.3E+04	L	5.1E+03	6.5E+03	6.5E+03	2.0E+04	X	No	No HQ	no HQ at LL 1 because no TRVs
Metals	Potassium	mg/kg	7440-09-7	6.7E+02	9.6E+02	1.4E+03	L	1.1E+03	1.3E+03	1.3E+03	3.6E+03	L	No	No HQ	no HQ at LL 1 because no TRVs
Metals	Sodium	mg/kg	7440-23-5	2.9E+02	3.7E+02	3.3E+02	N	3.2E+02	3.8E+02	3.8E+02	1.4E+03	X	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Explosives	Nitrocellulose	mg/kg	9004-70-0	9.0E+00		9.0E+00	X	1.1E+01	1.8E+01	1.8E+01	1.0E+02	D	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Pesticide/PCB	gamma-Chlordane	mg/kg	5103-74-2	1.1E-02		1.1E-02	X	1.0E-02	2.1E-02	2.1E-02	3.5E-02	D	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Semivolatile	Benz(a)anthracene	mg/kg	56-55-3	6.8E-02	2.3E-01	9.3E-02	N	1.8E-01	5.9E-01	4.1E-01	4.1E-01	L	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Semivolatile	Benzo(b)fluoranthene	mg/kg	205-99-2	1.2E-01	2.1E-01	1.3E-01	N	2.1E-01	4.5E-01	4.5E-01	4.7E-01	L	No	No HQ	no HQ at LL 1 because no TRVs

Appendix Table R-9. Summary of LL4 Analytes Whose Means Do Not Exceed LL1 Exposure Concentrations Qualify For NFA Because They Had no LL 1 HQs Due to Absence of TRVs

Analysis Type	Analyte	Units	CAS Registr Number	LL4 Mean	LL4 95% UCL of Mean	LL4 Max. Detect	LL4 Dist.	LL1 Mean	LL1 95% UCL of Mean	LL1 Exp. Conc.	LL1 Max. Detect	LL1 Dist.	Is LL4 Mean > LL1 Exp. Conc?	Maximum LL 1 HQ From SERA	Is Max LL 1 HQ < 1 (i.e., LL 4 analyte is NFA)?
Organics-Semivolatile	Benzo(ghi)perylene	mg/kg	191-24-2	8.3E-02	1.9E-01	1.0E-01	N	1.6E-01	2.1E-01	2.1E-01	2.4E-01	N	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Semivolatile	Benzo(k)fluoranthene	mg/kg	207-08-9	6.9E-02	1.4E-01	8.0E-02	N	1.9E-01	2.0E-01	2.0E-01	2.1E-01	D	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Semivolatile	Chrysene	mg/kg	218-01-9	1.1E-01	2.8E-01	1.4E-01	N	2.0E-01	6.0E-01	4.8E-01	4.8E-01	L	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Semivolatile	Fluoranthene	mg/kg	206-44-0	2.1E-01	7.2E-01	2.9E-01	N	3.0E-01	5.8E-01	5.8E-01	1.0E+00	X	No	No HQ	no HQ at LL 1 because no TRVs
Organics-Semivolatile	Phenanthrene	mg/kg	85-01-8	1.1E-01	5.1E-01	1.7E-01	N	2.2E-01	3.2E-01	3.2E-01	4.5E-01	D	No	No HQ	no HQ at LL 1 because no TRVs
Perimeter Area Aggregate															
Metals	Potassium	mg/kg	7440-09-7	6.5E+02	7.3E+02	1.0E+03	N	8.9E+02	1.0E+03	1.0E+03	1.5E+03	L	No	No HQ	no HQ at LL 1 because no TRVs

CAS = Chemical Abstract Service
TRV = toxicity reference value
UCL = Upper Confidence Level
Max. = Maximum
Dist. = distribution
Exp. Conc. = exposure concentration
HQ = hazard quotient
SERA = screening ecological risk assessment
NFA = no further analysis

Appendix Table R-10. Summary of LL4 Analytes Whose Means Do Not Exceed LL1 Exposure Concentrations But Require ESV Screening Because LL 1 Maximum HQ > 1 and Maximum Detect > Background

Analysis Type	Analyte	Units	CAS Registry Number	LL4 Mean	LL4 95% UCL of Mean	LL4 Max. Detect	LL4 Dist.	LL1 Mean	LL1 95% UCL of Mean	LL1 Exp. Conc.	LL1 Max. Detect	LL1 Dist.	Is LL4 Mean > LL1 Exp. Conc?	Maximum LL 1 HQ From SERA	Is Max LL 1 HQ < 1 (i.e., LL 4 Analyte is NFA)?	Bkg. Criteria	Is LL 4 Analyte Max. Det. < Bkg (i.e., NFA)?
Explosives Handling Areas Aggregate																	
Metals	Aluminum	mg/kg	7429-90-5	9.8E+03	1.1E+04	3.9E+04	X	9.4E+03	1.0E+04	1.0E+04	4.6E+04	X	No	4.98E+02	no	1.8E+04	no
Metals	Arsenic	mg/kg	7440-38-2	8.8E+00	9.5E+00	1.8E+01	N	1.0E+01	1.1E+01	1.1E+01	5.6E+01	X	No	6.10E+00	no	1.5E+01	no
Metals	Barium	mg/kg	7440-39-3	8.7E+01	1.1E+02	7.5E+02	X	1.1E+02	1.4E+02	1.4E+02	2.0E+03	X	No	1.02E+00	no	8.8E+01	no
Metals	Cadmium	mg/kg	7440-43-9	8.3E-01	1.2E+00	1.3E+01	X	1.4E+00	1.8E+00	1.8E+00	2.7E+01	X	No	1.30E+01	no		no
Metals	Chromium	mg/kg	7440-47-3	1.3E+01	1.5E+01	6.8E+01	X	2.0E+01	2.5E+01	2.5E+01	4.0E+02	X	No	6.20E+01	no	1.7E+01	no
Metals	Copper	mg/kg	7440-50-8	2.1E+01	2.5E+01	1.1E+02	L	6.2E+01	1.1E+02	1.1E+02	3.7E+03	X	No	2.00E+00	no	1.8E+01	no
Metals	Iron	mg/kg	7439-89-6	1.9E+04	2.0E+04	3.0E+04	N	2.1E+04	2.3E+04	2.3E+04	1.1E+05	X	No	2.25E+03	no	2.3E+04	no
Metals	Lead	mg/kg	7439-92-1	1.4E+02	2.8E+02	5.8E+03	X	2.0E+02	2.8E+02	2.8E+02	7.1E+03	X	No	4.61E+02	no	2.6E+01	no
Metals	Mercury	mg/kg	7487-94-6	3.8E-02	4.8E-02	3.6E-01	D	2.2E-01	3.4E-01	3.4E-01	9.7E+00	X	No	3.40E+00	no	3.6E-02	no
Metals	Zinc	mg/kg	7440-66-6	1.6E+02	2.6E+02	3.7E+03	X	1.6E+02	1.9E+02	1.9E+02	1.7E+03	X	No	1.43E+02	no	6.2E+01	no
Organics-Pesticide/PCB	4,4'-DDT	mg/kg	50-29-3	3.7E-02	7.3E-02	2.9E-01	D	2.1E-02	4.1E-02	4.1E-02	4.1E-02	D	No	3.30E+01	no		no
Organics-Pesticide/PCB	Dieldrin	mg/kg	60-57-1	7.7E-03	1.5E-02	7.0E-02	D	4.3E-02	9.8E-02	9.8E-02	5.5E-01	D	No	2.30E+01	no		no
Organics-Pesticide/PCB	PCB-1254	mg/kg	11097-69-1	3.4E-01	5.4E-01	3.2E+00	D	7.0E+01	4.0E+03	1.1E+03	1.1E+03	L	No	1.16E+05	no		no
Preparation and Receiving Areas Aggregate																	
Metals	Arsenic	mg/kg	7440-38-2	1.0E+01	1.4E+01	2.7E+01	L	1.2E+01	1.3E+01	1.3E+01	1.9E+01	N	No	7.00E+00	no	1.5E+01	no
Metals	Barium	mg/kg	7440-39-3	8.6E+01	1.2E+02	2.0E+02	L	1.1E+02	1.5E+02	1.5E+02	3.5E+02	L	No	1.10E+00	no	8.8E+01	no
Metals	Cadmium	mg/kg	7440-43-9	1.0E+00	2.4E+00	4.6E+00	L	2.6E+00	6.3E+00	6.3E+00	2.7E+01	L	No	4.40E+01	no		no
Metals	Chromium	mg/kg	7440-47-3	2.0E+01	3.5E+01	1.6E+02	X	3.0E+01	4.4E+01	4.4E+01	1.7E+02	X	No	1.10E+02	no	1.7E+01	no
Metals	Iron	mg/kg	7439-89-6	2.2E+04	3.1E+04	1.0E+05	X	2.4E+04	3.0E+04	3.0E+04	9.0E+04	X	No	3.02E+03	no	2.3E+04	no
Metals	Lead	mg/kg	7439-92-1	1.4E+02	3.9E+02	9.9E+02	L	2.4E+02	6.1E+02	6.1E+02	1.6E+03	L	No	4.00E+01	no	2.6E+01	no
Metals	Nickel	mg/kg	7440-02-0	1.7E+01	2.1E+01	4.8E+01	L	1.9E+01	2.3E+01	2.3E+01	6.1E+01	X	No	1.00E-01	no	2.1E+01	no
Metals	Zinc	mg/kg	7440-66-6	2.0E+02	3.4E+02	7.5E+02	L	1.9E+02	2.6E+02	2.6E+02	6.7E+02	L	No	1.95E+02	no	6.2E+01	no
Organics-Pesticide/PCB	PCB-1254	mg/kg	11097-69-1	2.9E+00	7.8E+00	4.8E+01	D	1.8E+00	7.6E+04	4.3E+00	4.3E+00	L	No	4.53E+02	no		no
Packaging and Shipping Areas Aggregate																	
Metals	Barium	mg/kg	7440-39-3	1.1E+02	2.1E+02	2.7E+02	L	1.1E+02	1.4E+02	1.4E+02	4.1E+02	L	No	1.02E+00	no	8.8E+01	no
Metals	Cadmium	mg/kg	7440-43-9	1.9E+00	1.9E+01	9.1E+00	L	3.2E+00	6.5E+00	6.5E+00	4.8E+01	L	No	4.50E+01	no		no
Metals	Chromium	mg/kg	7440-47-3	1.2E+01	1.8E+01	3.0E+01	L	2.5E+01	3.5E+01	3.5E+01	3.1E+02	X	No	8.80E+01	no	1.7E+01	no
Metals	Copper	mg/kg	7440-50-8	2.5E+01	3.9E+01	5.6E+01	L	1.1E+02	1.9E+02	1.9E+02	2.4E+03	X	No	3.00E+00	no	1.8E+01	no
Metals	Iron	mg/kg	7439-89-6	1.8E+04	2.7E+04	3.8E+04	L	2.0E+04	2.3E+04	2.3E+04	5.8E+04	L	No	2.26E+03	no	2.3E+04	no
Metals	Lead	mg/kg	7439-92-1	9.6E+01	1.8E+02	5.0E+02	X	1.7E+02	2.5E+02	2.5E+02	1.8E+03	X	No	4.12E+02	no	2.6E+01	no
Metals	Manganese	mg/kg	7439-96-5	6.6E+02	1.4E+03	1.9E+03	L	1.0E+03	1.3E+03	1.3E+03	3.7E+03	L	No	2.60E+00	no	1.5E+03	no
Metals	Mercury	mg/kg	7487-94-6	2.8E-02	5.4E-02	7.8E-02	L	7.1E-02	9.1E-02	9.1E-02	4.1E-01	L	No	1.50E+00	no	3.6E-02	no
Metals	Zinc	mg/kg	7440-66-6	2.3E+02	5.7E+02	8.4E+02	L	3.4E+02	4.6E+02	4.6E+02	2.1E+03	X	No	3.42E+02	no	6.2E+01	no
Organics-Pesticide/PCB	PCB-1254	mg/kg	11097-69-1	2.2E-01	3.8E-01	7.5E-01	D	8.6E-01	1.7E+00	1.7E+00	2.4E+00	N	No	1.79E+02	no		no
Perimeter Area Aggregate																	
Metals	Cadmium	mg/kg	7440-43-9	2.3E-01	2.8E-01	5.4E-01	N	2.4E-01	2.7E-01	2.7E-01	3.2E-01	D	No	2.00E+00	no		no
Metals	Iron	mg/kg	7439-89-6	1.6E+04	1.8E+04	2.4E+04	N	2.2E+04	2.4E+04	2.4E+04	3.3E+04	L	No	2.40E+03	no	2.3E+04	no
Metals	Manganese	mg/kg	7439-96-5	4.3E+02	6.6E+02	1.8E+03	L	9.2E+02	1.4E+03	1.4E+03	2.3E+03	L	No	3.00E+00	no	1.5E+03	no
Metals	Zinc	mg/kg	7440-66-6	5.7E+01	6.8E+01	1.2E+02	L	5.8E+01	6.2E+01	6.2E+01	7.8E+01	N	No	4.60E+01	no	6.2E+01	no
Melt Pour Area Drainage Ditches Aggregate																	
Metals	Arsenic	mg/kg	7440-38-2	9.1E+00	1.1E+01	1.6E+01	N	1.1E+01	1.3E+01	1.3E+01	2.5E+01	L	No	7.00E+00	no	1.5E+01	no
Metals	Cadmium	mg/kg	7440-43-9	1.5E-01	2.0E-01	3.2E-01	N	2.4E-01	2.7E-01	2.7E-01	3.2E-01	D	No	1.90E+00	no		no
Metals	Chromium	mg/kg	7440-47-3	9.5E+00	1.1E+01	1.7E+01	L	1.6E+01	1.7E+01	1.7E+01	2.5E+01	L	No	4.20E+01	no	1.7E+01	no
Metals	Iron	mg/kg	7439-89-6	1.7E+04	2.2E+04	2.6E+04	N	2.2E+04	2.4E+04	2.4E+04	3.3E+04	L	No	2.40E+03	no	2.3E+04	no
Metals	Lead	mg/kg	7439-92-1	1.4E+01	1.7E+01	2.7E+01	L	1.9E+01	2.1E+01	2.1E+01	3.5E+01	L	No	3.40E+01	no	2.6E+01	no

CAS = Chemical Abstract Service
UCL = Upper Confidence Level
Max. = Maximum
Dist. = distribution
Exp. Conc. = exposure concentration
HQ = hazard quotient
SERA = screening ecological risk assessment
NFA = no further analysis
Bkg. = background

Appendix Table R-11. Load Line 4 Explosive Hanlding Areas Aggregate ESV Pre-Screening Table for Surface Soil at Ravenna, Ohio

LL4 Analytes	CAS Registry Number	Surface Soil Maximum Concentrations (mg/kg)	Preferred Ecological Screening Value (mg/kg)	Reference	Is Maximum above or below the Preferred Ecological Screening Value?	Is analyte a PBT compound?[a]	Analytes remaining after the EU specific ESV and PBT screen?[b]
Metals							
Aluminum	7429-90-5	3.90E+04	6.00E+02	LOEC	above	no	yes
Arsenic	7440-38-2	1.80E+01	9.90E+00	PRGs	above	no	yes
Barium	7440-39-3	7.50E+02	2.83E+02	PRGs	above	no	yes
Cadmium	7440-43-9	1.30E+01	4.00E+00	PRGs	above	yes	yes
Chromium	7440-47-3	6.80E+01	4.00E-01	PRGs	above	no	yes
Copper	7440-50-8	1.10E+02	1.39E+01	PPL (SAIC 2002)	above	no	yes
Iron	7439-89-6	3.00E+04	2.00E+02	NOEC	above	no	yes
Lead	7439-92-1	5.80E+03	4.05E+01	PRGs	above	yes	yes
Mercury	7487-94-6	3.60E-01	5.10E-04	PRGs	above	yes	yes
Zinc	7440-66-6	3.70E+03	8.50E+00	PRGs	above	yes	yes
Organics-Pesticide/PCB							
4,4'-DDT	50-29-3	2.90E-01	1.75E-02	EDQL EPA Region 5 (1998)	above	yes	yes
Dieldrin	60-57-1	7.00E-02	2.38E-03	EDQL EPA Region 5 (1998)	above	yes	yes
PCB-1254	11097-69-1	3.20E+00	No ESV	No Source	no screening value	yes	yes

LL4 = Load Line 4

CAS = Chemical Abstract Service

Max = Maximum detected concentration

ESV = Preferred Ecological Screening Value

PBT = Persistent, bioaccumulative, and toxic pollutants (If PBT, analyte is retained even if concentration is below ESV)

EU = Exposure Unit

[a]Yes = BAF is 2 or grater for metals, or log Kow is 4 or greater for organics; else, no

[b]Yes = Max > preferred ecological screening value or no ecological screening value; no = Max < preferred ecological screening value

LOEC = lowest observed effect concentration

PRG = preliminary remediation goal

NOEC = no observed effect concentration

EDQL = ecological data quality level

Appendix Table R-12. Load Line 4 Preparation and Receiving Areas Aggregate ESV Pre-Screening Table for Surface Soil at Ravenna, Ohio

LL4 Analytes	CAS Registry Number	Surface Soil Maximum Concentrations (mg/kg)	Preferred Ecological Screening Value (mg/kg)	Reference	Is Maximum above or below the Preferred Ecological Screening Value?	Is analyte a PBT compound?[a]	Analytes remaining after the EU specific ESV and PBT screen?[b]
Metals							
Arsenic	7440-38-2	2.70E+01	9.90E+00	PRGs	above	no	yes
Barium	7440-39-3	2.00E+02	2.83E+02	PRGs	below	no	no
Cadmium	7440-43-9	4.60E+00	4.00E+00	PRGs	above	yes	yes
Chromium	7440-47-3	1.60E+02	4.00E-01	PRGs	above	no	yes
Iron	7439-89-6	1.00E+05	2.00E+02	NOEC	above	no	yes
Lead	7439-92-1	9.90E+02	4.05E+01	PRGs	above	yes	yes
Nickel	7440-02-0	4.80E+01	3.00E+01	PRGs	above	no	yes
Zinc	7440-66-6	7.50E+02	8.50E+00	PRGs	above	yes	yes
Organics-Pesticide/PCB							
PCB-1254	11097-69-1	4.80E+01	No ESV	No Source	no screening value	yes	yes

LL4 = Load Line 4

CAS = Chemical Abstract Service

Max = Maximum detected concentration

ESV = Preferred Ecological Screening Value

PBT = Persistent, bioaccumulative, and toxic pollutants (If PBT, analyte is retained even if concentration is below ESV)

EU = Exposure Unit

[a]Yes = BAF is 2 or grater for metals, or log Kow is 4 or greater for organics; else, no

[b]Yes = Max > preferred ecological screening value or no ecological screening value; no = Max < preferred ecological screening value

LOEC = lowest observed effect concentration

PRG = preliminary remediation goal

NOEC = no observed effect concentration

EDQL = ecological data quality level

Appendix Table R-13. Load Line 4 Packaging and Shipping Areas Aggregate ESV Pre-Screening Table for Surface Soil at Ravenna, Ohio

LL4 Analytes	CAS Registry Number	Surface Soil Maximum Concentrations (mg/kg)	Preferred Ecological Screening Value (mg/kg)	Reference	Is Maximum above or below the Preferred Ecological Screening Value?	Is analyte a PBT compound?[a]	Analytes remaining after the EU specific ESV and PBT screen?[b]
Metals							
Barium	7440-39-3	2.70E+02	2.83E+02	PRGs	below	no	no
Cadmium	7440-43-9	9.10E+00	4.00E+00	PRGs	above	yes	yes
Chromium	7440-47-3	3.00E+01	4.00E-01	PRGs	above	no	yes
Copper	7440-50-8	5.60E+01	1.39E+01	PPL (SAIC 2002)	above	no	yes
Iron	7439-89-6	3.80E+04	2.00E+02	NOEC	above	no	yes
Lead	7439-92-1	5.00E+02	4.05E+01	PRGs	above	yes	yes
Manganese	7439-96-5	1.90E+03	1.00E+02	LOEC	above	no	yes
Mercury	7487-94-6	7.80E-02	5.10E-04	PRGs	above	yes	yes
Zinc	7440-66-6	8.40E+02	8.50E+00	PRGs	above	yes	yes
Organics-Pesticide/PCB							
PCB-1254	11097-69-1	7.50E-01	No ESV	No Source	no screening value	yes	yes

LL4 = Load Line 4

CAS = Chemical Abstract Service

Max = Maximum detected concentration

ESV = Preferred Ecological Screening Value

PBT = Persistent, bioaccumulative, and toxic pollutants (If PBT, analyte is retained even if concentration is below ESV)

EU = Exposure Unit

[a]Yes = BAF is 2 or grater for metals, or log Kow is 4 or greater for organics; else, no

[b]Yes = Max > preferred ecological screening value or no ecological screening value; no = Max < preferred ecological screening value

LOEC = lowest observed effect concentration

PRG = preliminary remediation goal

NOEC = no observed effect concentration

EDQL = ecological data quality level

Appendix Table R-14. Load Line 4 Melt Pour Area Drainage Ditches Aggregate ESV Pre-Screening Table for Surface Soil at Ravenna, Ohio

LL4 Analytes	CAS Registry Number	Surface Soil Maximum Concentrations (mg/kg)	Preferred Ecological Screening Value (mg/kg)	Reference	Is Maximum above or below the Preferred Ecological Screening Value?	Is analyte a PBT compound?[a]	Analytes remaining after the EU specific ESV and PBT screen?[b]
Metals							
Arsenic	7440-38-2	1.60E+01	9.90E+00	PRGs	above	no	yes
Cadmium	7440-43-9	3.20E-01	4.00E+00	PRGs	below	yes	yes
Chromium	7440-47-3	1.70E+01	4.00E-01	PRGs	above	no	yes
Iron	7439-89-6	2.60E+04	2.00E+02	NOEC	above	no	yes
Lead	7439-92-1	2.70E+01	4.05E+01	PRGs	below	yes	yes

LL4 = Load Line 4

CAS = Chemical Abstract Service
Max = Maximum detected concentration
ESV = Preferred Ecological Screening Value
PBT = Persistent, bioaccumulative, and toxic pollutants (If PBT, analyte is retained even if concentration is below ESV)
EU = Exposure Unit

[a]Yes = BAF is 2 or grater for metals, or log Kow is 4 or greater for organics; else, no

[b]Yes = Max > preferred ecological screening value or no ecological screening value; no = Max < preferred ecological screening value
LOEC = lowest observed effect concentration
PRG = preliminary remediation goal
NOEC = no observed effect concentration

Appendix Table R-15. Load Line 4 Perimeter Area ESV Pre-Screening Table for Surface Soil at Ravenna, Ohio

LL4 Analytes	CAS Registry Number	Surface Soil Maximum Concentrations (mg/kg)	Preferred Ecological Screening Value (mg/kg)	Reference	Is Maximum above or below the Preferred Ecological Screening Value?	Is analyte a PBT compound?[a]	Analytes remaining after the EU specific ESV and PBT screen?[b]
Metals							
Cadmium	7440-43-9	5.40E-01	4.00E+00	PRGs	below	yes	yes
Iron	7439-89-6	2.40E+04	2.00E+02	NOEC	above	no	yes
Manganese	7439-96-5	1.80E+03	1.00E+02	LOEC	above	no	yes
Zinc	7440-66-6	1.20E+02	8.50E+00	PRGs	above	yes	yes

LL4 = Load Line 4

CAS = Chemical Abstract Service
Max = Maximum detected concentration
ESV = Preferred Ecological Screening Value
PBT = Persistent, bioaccumulative, and toxic pollutants (If PBT, analyte is retained even if concentration is below ESV)
EU = Exposure Unit

[a]Yes = BAF is 2 or grater for metals, or log Kow is 4 or greater for organics; else, no

[b]Yes = Max > preferred ecological screening value or no ecological screening value; no = Max < preferred ecological screening value
LOEC = lowest observed effect concentration
PRG = preliminary remediation goal
NOEC = no observed effect concentration

Appendix Table R-16. T-Test Comparison of Load Line 4 Means with Load Line 1 Means for Analytes with Means That Exceeded Load Line 1 Exposure Concentrations

Analysis Type	Parameter - Load Line 1	Units	CAS Number	LL4 Results > Det. Limit	Mean - Load Line 4	LL4 Std. Dev.	Dist. - Load Line 4	LL1 Results > Det. Limit	Mean - Load Line 1	LL1 Std. Dev.	Dist. - Load Line 1	Is LL4 Mean > LL1 Exposure Concentration	Is LL4 Max. Det. > Background Criteria?	Percent Difference	t-Test Statistic	1-Tailed Probability	Is LL4 Mean Statistically > LL1 Mean?
Explosives Handling Areas Aggregate																	
General	Chromium, hexavalent	mg/kg	18540-29-9	1/ 1	1.90		X	0/ 23	0.82	0.68	D	Yes	Yes	79.45			Yes
Metals	Beryllium	mg/kg	7440-41-7	28/ 40	0.89	1.26	X	96/ 160	0.40	0.43	X	Yes	Yes	75.26	-4.07	0.00	Yes
Metals	Calcium	mg/kg	7440-70-2	40/ 40	16710.00	42920.62	X	159/ 160	7362.00	17956.81	X	Yes	Yes	77.67	-2.12	0.02	Yes
Metals	Magnesium	mg/kg	7439-95-4	40/ 40	4788.00	7412.60	X	160/ 160	2356.00	2416.33	X	Yes	Yes	68.09	-3.49	0.00	Yes
Metals	Manganese	mg/kg	7439-96-5	70/ 70	702.10	1275.38	X	160/ 160	638.50	474.38	X	Yes	Yes	9.49	-0.55	0.29	No
Metals	Selenium	mg/kg	7782-49-2	42/ 70	0.97	0.97	L	102/ 160	0.71	0.55	X	Yes	Yes	30.30	-2.52	0.01	Yes
Metals	Sodium	mg/kg	7440-23-5	15/ 40	315.30	201.66	D	25/ 160	254.60	186.50	D	Yes	Yes	21.30	-1.81	0.04	Yes
Metals	Thallium	mg/kg	6533-73-9	28/ 40	0.92	2.05	X	152/ 160	0.50	0.25	X	Yes	Yes	58.35	-2.50	0.01	Yes
Organics-Pesticide/PCB	Methoxychlor	mg/kg	72-43-5	2/ 17	0.02	0.05	D	1/ 17	0.04	0.09	D	Yes	Yes	-57.05	0.66	0.74	No
Organics-Semivolatile	Benzo(b)fluoranthene	mg/kg	205-99-2	10/ 19	1.11	1.95	L	6/ 18	0.44	0.54	D	Yes	Yes	86.32	-1.40	0.08	No
Organics-Semivolatile	Benzo(ghi)perylene	mg/kg	191-24-2	8/ 18	0.60	0.93	D	3/ 18	0.37	0.43	D	Yes	Yes	48.10	-0.96	0.17	No
Organics-Semivolatile	Benzo(k)fluoranthene	mg/kg	207-08-9	8/ 19	0.68	1.24	D	3/ 18	0.37	0.44	D	Yes	Yes	59.15	-1.01	0.16	No
Organics-Semivolatile	Bis(2-ethylhexyl)phthalat	mg/kg	117-81-7	9/ 19	0.19	0.14	D	4/ 18	0.35	0.45	D	Yes	Yes	-61.43	1.51	0.93	No
Organics-Semivolatile	Chrysene	mg/kg	218-01-9	11/ 19	0.84	1.58	L	4/ 18	0.43	0.50	D	Yes	Yes	64.49	-1.05	0.15	No
Organics-Semivolatile	Dibenz(a,h)anthracene	mg/kg	53-70-3	4/ 19	0.26	0.26	D	1/ 18	0.37	0.45	D	Yes	Yes	-34.81	0.91	0.82	No
Organics-Semivolatile	Indeno(1,2,3-cd)pyrene	mg/kg	193-39-5	8/ 18	0.56	0.89	D	3/ 18	0.37	0.44	D	Yes	Yes	39.90	-0.80	0.22	No
Organics-Semivolatile	Naphthalene	mg/kg	91-20-3	1/ 19	0.27	0.17	D	1/ 18	0.37	0.44	D	Yes	Yes	-33.49	0.99	0.84	No
Organics-Volatile	Acetone	mg/kg	67-64-1	1/ 16	0.01	0.01	D	2/ 18	0.01	0.00	D	Yes	Yes	55.73	-1.69	0.05	No
Preparation and Receiving Areas Aggregate																	
Metals	Mercury	mg/kg	7487-94-6	15/ 17	0.53	1.79	X	20/ 22	0.09	0.09	L	Yes	Yes	144.43	-1.16	0.13	No
Metals	Selenium	mg/kg	7782-49-2	5/ 17	0.99	0.69	D	10/ 22	0.55	0.37	D	Yes	No	55.99	-2.49	0.01	Yes
Organics-Explosives	Nitrocellulose	mg/kg	9004-70-0	1/ 3	7.41	9.87	D	5/ 13	2.60	3.92	D	Yes	Yes	96.09	-1.44	0.09	No
Organics-Pesticide/PCB	PCB-1260	mg/kg	11096-82-5	1/ 16	0.46	1.44	D	0/ 4	0.13	0.09	D	Yes	Yes	113.88	-0.45	0.33	No
Organics-Volatile	2-Butanone	mg/kg	78-93-3	1/ 5	0.01	0.01	D	0/ 5	0.01	0.00	D	Yes	Yes	55.60	-1.92	0.05	Yes
Organics-Volatile	Acetone	mg/kg	67-64-1	2/ 4	0.02	0.02	N	0/ 5	0.01	0.00	D	Yes	Yes	97.79	-1.50	0.09	No
Packaging and Shipping Areas Aggregate																	
Metals	Selenium	mg/kg	7782-49-2	7/ 11	0.94	0.64	L	19/ 50	0.67	0.68	D	Yes	No	33.75	-1.20	0.12	No
Organics-Pesticide/PCB	alpha-Chlordane	mg/kg	5103-71-9	1/ 1	0.01		X	0/ 6	0.00	0.00	D	Yes	Yes	101.20			Yes
Organics-Pesticide/PCB	Dieldrin	mg/kg	60-57-1	1/ 1	0.01		X	0/ 6	0.00	0.00	D	Yes	Yes	101.20			Yes
Organics-Pesticide/PCB	Endrin aldehyde	mg/kg	7421-93-4	1/ 1	0.06		X	3/ 6	0.02	0.02	L	Yes	Yes	92.38			Yes
Organics-Pesticide/PCB	Methoxychlor	mg/kg	72-43-5	1/ 1	0.03		X	0/ 6	0.01	0.01	D	Yes	Yes	96.15			Yes
Perimeter Area Aggregate																	
Metals	Calcium	mg/kg	7440-70-2	20/ 20	5831.00	14816.75	X	22/ 26	2016.00	6583.93	X	Yes	Yes	97.23	-1.17	0.12	No
Metals	Chromium	mg/kg	7440-47-3	24/ 24	18.91	23.63	X	26/ 26	15.60	3.29	L	Yes	Yes	19.18	-0.71	0.24	No
Metals	Lead	mg/kg	7439-92-1	24/ 24	123.40	296.02	X	26/ 26	19.19	5.18	L	Yes	Yes	146.17	-1.80	0.04	Yes
Metals	Magnesium	mg/kg	7439-95-4	20/ 20	2193.00	1654.19	L	26/ 26	1778.00	425.30	L	Yes	Yes	20.90	-1.23	0.11	No
Organics-Semivolatile	Benzo(a)pyrene	mg/kg	50-32-8	1/ 5	0.26	0.10	D	0/ 2	0.20	0.01	D	Yes	Yes	26.18	-0.81	0.23	No
Organics-Semivolatile	Benzo(b)fluoranthene	mg/kg	205-99-2	1/ 5	0.19	0.17	D	1/ 2	0.12	0.12	N	Yes	Yes	40.75	-0.48	0.33	No
Organics-Semivolatile	Fluoranthene	mg/kg	206-44-0	2/ 5	0.23	0.11	D	1/ 2	0.13	0.10	N	Yes	Yes	56.60	-1.13	0.16	No
Organics-Semivolatile	Indeno(1,2,3-cd)pyrene	mg/kg	193-39-5	1/ 5	0.27	0.11	D	0/ 2	0.20	0.01	D	Yes	Yes	32.59	-0.91	0.20	No
Melt-Pour Area Drainage Ditches Aggregate																	
Metals	Antimony	mg/kg	7440-36-0	1/ 7	0.87	0.57	D	2/ 26	0.63	0.06	D	Yes	Yes	31.60	-2.19	0.02	Yes
Metals	Calcium	mg/kg	7440-70-2	7/ 7	4229.00	1461.93	L	22/ 26	2016.00	6583.93	X	Yes	No	70.87	-0.87	0.19	No
Metals	Copper	mg/kg	7440-50-8	7/ 7	14.00	3.89	N	26/ 26	10.83	3.40	L	Yes	Yes	25.53	-2.13	0.02	Yes
Metals	Magnesium	mg/kg	7439-95-4	7/ 7	2601.00	750.28	N	26/ 26	1778.00	425.30	L	Yes	Yes	37.59	-3.83	0.00	Yes
Metals	Zinc	mg/kg	7440-66-6	15/ 15	71.66	18.57	N	26/ 26	58.40	9.84	N	Yes	Yes	20.39	-3.00	0.00	Yes
Organics-Semivolatile	Fluoranthene	mg/kg	206-44-0	1/ 3	0.20	0.12	D	1/ 2	0.13	0.10	N	Yes	Yes	41.93	-0.68	0.27	No
Organics-Semivolatile	Phenanthrene	mg/kg	85-01-8	1/ 3	0.35	0.24	D	0/ 2	0.20	0.01	D	Yes	Yes	54.81	-0.83	0.23	No
Organics-Semivolatile	Pyrene	mg/kg	129-00-0	1/ 3	0.35	0.25	D	0/ 2	0.20	0.01	D	Yes	Yes	56.31	-0.81	0.24	No

Appendix Table R-17. LL4 Analytes Whose Means Exceeded LL1 Exposure Concentrations But T-Test Shows No Significant Difference Between Means; Plus Maximum LL1 HQs

Analysis Type	Analyte - LL 1	Units	CAS Registry Number	LL4 Results > Det. Limit	Mean - LL 4	LL4 Std. Dev.	Dist. - Load Line 4	LL1 Results > Det. Limit	Mean - LL 1	LL1 Std. Dev.	Dist. - Load Line 1	Is LL4 Mean > LL1 Exposure Concentration	Percent Difference	t-Test Statistic	1-Tailed Probability	Is LL4 Mean Statistically > LL1 Mean?	LL1 Max. HQ	Is LL1 Max. HQ < 1 (i.e., NFA)?	Is LL4 Max. Det. < Bkg (i.e., NFA)?
Explosives Handling Areas Aggregate																			
Metals	Manganese	mg/kg	7439-96-5	70/ 70	702.10	1275.38	X	160/ 160	638.50	474.38	X	Yes	9.49	-0.55	0.29	No	1.40E+00	no	no
Organics-Pesticide/PCB	Methoxychlor	mg/kg	72-43-5	2/ 17	0.02	0.05	D	1/ 17	0.04	0.09	D	Yes	-57.05	0.66	0.74	No	no HQ	no HQ at LL 1 because no	no
Organics-Semivolatile	Benzo(b)fluoranthene	mg/kg	205-99-2	10/ 19	1.11	1.95	L	6/ 18	0.44	0.54	D	Yes	86.32	-1.40	0.08	No	no HQ	no HQ at LL 1 because no	no
Organics-Semivolatile	Benzo(ghi)perylene	mg/kg	191-24-2	8/ 18	0.60	0.93	D	3/ 18	0.37	0.43	D	Yes	48.10	-0.96	0.17	No	no HQ	no HQ at LL 1 because no	no
Organics-Semivolatile	Benzo(k)fluoranthene	mg/kg	207-08-9	8/ 19	0.68	1.24	D	3/ 18	0.37	0.44	D	Yes	59.15	-1.01	0.16	No	no HQ	no HQ at LL 1 because no	no
Organics-Semivolatile	Bis(2-ethylhexyl)phthalate	mg/kg	117-81-7	9/ 19	0.19	0.14	D	4/ 18	0.35	0.45	D	Yes	-61.43	1.51	0.93	No	5.44E-04	**Yes**	no
Organics-Semivolatile	Chrysene	mg/kg	218-01-9	11/ 19	0.84	1.58	L	4/ 18	0.43	0.50	D	Yes	64.49	-1.05	0.15	No	no HQ	no HQ at LL 1 because no	no
Organics-Semivolatile	Dibenz(a,h)anthracene	mg/kg	53-70-3	4/ 19	0.26	0.26	D	1/ 18	0.37	0.45	D	Yes	-34.81	0.91	0.82	No	--	no HQ; SRC at LL 1 was eliminated during ESV	no
Organics-Semivolatile	Indeno(1,2,3-cd)pyrene	mg/kg	193-39-5	8/ 18	0.56	0.89	D	3/ 18	0.37	0.44	D	Yes	39.90	-0.80	0.22	No	--	no HQ; SRC at LL 1 was eliminated during ESV	no
Organics-Semivolatile	Naphthalene	mg/kg	91-20-3	1/ 19	0.27	0.17	D	1/ 18	0.37	0.44	D	Yes	-33.49	0.99	0.84	No	--	no HQ; SRC at LL 1 was eliminated during ESV	no
Organics-Volatile	Acetone	mg/kg	67-64-1	1/ 16	0.01	0.01	D	2/ 18	0.01	0.00	D	Yes	55.73	-1.69	0.05	No	--	no HQ; SRC at LL 1 was eliminated during ESV	no
Preparation and Receiving Areas Aggregate																			
Metals	Mercury	mg/kg	7487-94-6	15/ 17	0.53	1.79	X	20/ 22	0.09	0.09	L	Yes	144.43	-1.16	0.13	No	1.40E+00	no	no
Organics-Explosives	Nitrocellulose	mg/kg	9004-70-0	1/ 3	7.41	9.87	D	5/ 13	2.60	3.92	D	Yes	96.09	-1.44	0.09	No	no HQ	no HQ at LL 1 because no	no
Organics-Pesticide/PCB	PCB-1260	mg/kg	11096-82-5	1/ 16	0.46	1.44	D	0/ 4	0.13	0.09	D	Yes	113.88	-0.45	0.33	No	--	no HQ; SRC at LL 1 was eliminated during ESV	no
Organics-Volatile	Acetone	mg/kg	67-64-1	2/ 4	0.02	0.02	N	0/ 5	0.01	0.00	D	Yes	97.79	-1.50	0.09	No	--	no HQ; SRC at LL 1 was eliminated during ESV	no
Packaging and Shipping Areas Aggregate																			
Metals	Selenium	mg/kg	7782-49-2	7/ 11	0.94	0.64	L	19/ 50	0.67	0.68	D	Yes	33.75	-1.20	0.12	No	1.23E+00	no	**Yes**
Perimeter Area Aggregate																			
Metals	Calcium	mg/kg	7440-70-2	20/ 20	5831.00	14816.75	X	22/ 26	2016.00	6583.93	X	Yes	97.23	-1.17	0.12	No	no HQ	no HQ at LL 1 because no	no
Metals	Chromium	mg/kg	7440-47-3	24/ 24	18.91	23.63	X	26/ 26	15.60	3.29	L	Yes	19.18	-0.71	0.24	No	4.20E+01	no	no

Appendix Table R-17. LL4 Analytes Whose Means Exceeded LL1 Exposure Concentrations But T-Test Shows No Significant Difference Between Means; Plus Maximum LL1 HQs

Analysis Type	Analyte - LL 1	Units	CAS Registry Number	LL4 Results > Det. Limit	Mean - LL 4	LL4 Std. Dev.	Dist. - Load Line 4	LL1 Results > Det. Limit	Mean - LL 1	LL1 Std. Dev.	Dist. - Load Line 1	Is LL4 Mean > LL1 Exposure Concentration	Percent Difference	t-Test Statistic	1-Tailed Probability	Is LL4 Mean Statistically > LL1 Mean?	LL1 Max. HQ	Is LL1 Max. HQ < 1 (i.e., NFA)?	Is LL4 Max. Det. < Bkg (i.e., NFA)?
Metals	Magnesium	mg/kg	7439-95-4	20/ 20	2193.00	1654.19	L	26/ 26	1778.00	425.30	L	Yes	20.90	-1.23	0.11	No	no HQ	no HQ at LL 1 because no	no
Organics-Semivolatile	Benzo(a)pyrene	mg/kg	50-32-8	1/ 5	0.26	0.10	D	0/ 2	0.20	0.01	D	Yes	26.18	-0.81	0.23	No	--	no HQ; SRC at LL 1 was eliminated during ESV	no
Organics-Semivolatile	Benzo(b)fluoranthene	mg/kg	205-99-2	1/ 5	0.19	0.17	D	1/ 2	0.12	0.12	N	Yes	40.75	-0.48	0.33	No	no HQ	no HQ at LL 1 because no	no
Organics-Semivolatile	Fluoranthene	mg/kg	206-44-0	2/ 5	0.23	0.11	D	1/ 2	0.13	0.10	N	Yes	56.60	-1.13	0.16	No	no HQ	no HQ at LL 1 because no	no
Organics-Semivolatile	Indeno(1,2,3-cd)pyrene	mg/kg	193-39-5	1/ 5	0.27	0.11	D	0/ 2	0.20	0.01	D	Yes	32.59	-0.91	0.20	No	--	no HQ; SRC at LL 1 was eliminated during ESV	no
Melt-Pour Area Drainage Ditches Aggregate																			
Metals	Calcium	mg/kg	7440-70-2	7/ 7	4229.00	1461.93	L	22/ 26	2016.00	6583.93	X	Yes	70.87	-0.87	0.19	No	no HQ	no HQ at LL 1 because no	Yes
Organics-Semivolatile	Fluoranthene	mg/kg	206-44-0	1/ 3	0.20	0.12	D	1/ 2	0.13	0.10	N	Yes	41.93	-0.68	0.27	No	no HQ	no HQ at LL 1 because no	no
Organics-Semivolatile	Phenanthrene	mg/kg	85-01-8	1/ 3	0.35	0.24	D	0/ 2	0.20	0.01	D	Yes	54.81	-0.83	0.23	No	--	no HQ; SRC at LL 1 was eliminated during ESV	no
Organics-Semivolatile	Pyrene	mg/kg	129-00-0	1/ 3	0.35	0.25	D	0/ 2	0.20	0.01	D	Yes	56.31	-0.81	0.24	No	--	no HQ; SRC at LL 1 was eliminated during ESV	no

LL1 = Load Line 1
CAS = Chemical Abstract Service
LL4 = Load Line 4
Std. Dev. = standard deviation
Det. = detected
Dist. = distribution
HQ = hazard quotient
NFA = no further action
Bkg. = background

Appendix Table R-18. T-Test Comparison of Load Line 4 Means with Load Line 1 Means for Analytes with Means That Exceeded Load Line 1 Exposure Concentrations And T-Test Indicates That Difference Is Significant

Analysis Type	Parameter - Load Line 1	Units	CAS Number	LL4 Results > Det. Limit	Mean - Load Line 4	LL4 Std. Dev.	Dist. - Load Line 4	LL1 Results > Det. Limit	Mean - Load Line 1	LL1 Std. Dev.	Dist. - Load Line 1	Is LL4 Mean > LL1 Exposure Concentration	Is LL4 Max. Det. > Background Criteria?	Percent Difference	t-Test Statistic	1-Tailed Probability	Is LL4 Mean Statistically > LL1 Mean?
Explosives Handling Areas Aggregate																	
General	Chromium, hexavalent	mg/kg	18540-29-9	1/ 1	1.90		X	0/ 23	0.82	0.68	D	Yes	Yes	79.45			Yes
Metals	Beryllium	mg/kg	7440-41-7	28/ 40	0.89	1.26	X	96/ 160	0.40	0.43	X	Yes	Yes	75.26	-4.07	0.00	Yes
Metals	Calcium	mg/kg	7440-70-2	40/ 40	16710.00	42920.62	X	159/ 160	7362.00	17956.81	X	Yes	Yes	77.67	-2.12	0.02	Yes
Metals	Magnesium	mg/kg	7439-95-4	40/ 40	4788.00	7412.60	X	160/ 160	2356.00	2416.33	X	Yes	Yes	68.09	-3.49	0.00	Yes
Metals	Selenium	mg/kg	7782-49-2	42/ 70	0.97	0.97	L	102/ 160	0.71	0.55	X	Yes	Yes	30.30	-2.52	0.01	Yes
Metals	Sodium	mg/kg	7440-23-5	15/ 40	315.30	201.66	D	25/ 160	254.60	186.50	D	Yes	Yes	21.30	-1.81	0.04	Yes
Metals	Thallium	mg/kg	6533-73-9	28/ 40	0.92	2.05	X	152/ 160	0.50	0.25	X	Yes	Yes	58.35	-2.50	0.01	Yes
Preparation and Receiving Areas Aggregate																	
Metals	Selenium	mg/kg	7782-49-2	5/ 17	0.99	0.69	D	10/ 22	0.55	0.37	D	Yes	No	55.99	-2.49	0.01	Yes
Organics-Volatile	2-Butanone	mg/kg	78-93-3	1/ 5	0.01	0.01	D	0/ 5	0.01	0.00	D	Yes	Yes	55.60	-1.92	0.05	Yes
Packaging and Shipping Areas Aggregate																	
Organics-Pesticide/PCB	alpha-Chlordane	mg/kg	5103-71-9	1/ 1	0.01		X	0/ 6	0.00	0.00	D	Yes	Yes	101.20			Yes
Organics-Pesticide/PCB	Dieldrin	mg/kg	60-57-1	1/ 1	0.01		X	0/ 6	0.00	0.00	D	Yes	Yes	101.20			Yes
Organics-Pesticide/PCB	Endrin aldehyde	mg/kg	7421-93-4	1/ 1	0.06		X	3/ 6	0.02	0.02	L	Yes	Yes	92.38			Yes
Organics-Pesticide/PCB	Methoxychlor	mg/kg	72-43-5	1/ 1	0.03		X	0/ 6	0.01	0.01	D	Yes	Yes	96.15			Yes
Perimeter Area Aggregate																	
Metals	Lead	mg/kg	7439-92-1	24/ 24	123.40	296.02	X	26/ 26	19.19	5.18	L	Yes	Yes	146.17	-1.80	0.04	Yes
Melt-Pour Area Drainage Ditches Aggregate																	
Metals	Antimony	mg/kg	7440-36-0	1/ 7	0.87	0.57	D	2/ 26	0.63	0.06	D	Yes	Yes	31.60	-2.19	0.02	Yes
Metals	Copper	mg/kg	7440-50-8	7/ 7	14.00	3.89	N	26/ 26	10.83	3.40	L	Yes	Yes	25.53	-2.13	0.02	Yes
Metals	Magnesium	mg/kg	7439-95-4	7/ 7	2601.00	750.28	N	26/ 26	1778.00	425.30	L	Yes	Yes	37.59	-3.83	0.00	Yes
Metals	Zinc	mg/kg	7440-66-6	15/ 15	71.66	18.57	N	26/ 26	58.40	9.84	N	Yes	Yes	20.39	-3.00	0.00	Yes

Appendix Table R-19. Summary of Distances Between Load Line 4 Locations with Concentrations Exceeding Load Line 1 Exposure Concentrations And With Significantly Greater Means Based on the T-Test

Analysis Type	Parameter - Load Line 1	Units	CAS Number	LL4 Results > Det. Limit	Mean - Load Line 4	Dist. - Load Line 4	Exposure Concentration - Load Line 1	Number of Samples > LL1 Exposure Conc.	Is LL4 Mean > LL1 Exposure Concentration	Is LL4 Max. Det. > Background Criteria?	Is LL4 Mean Statistically > LL1 Mean?	Number of Distance Calculations	Mean Distance	Min. Distance	Max. Distance
Explosives Handling Areas Aggregate															
General	Chromium, hexavalent	mg/kg	18540-29-9	1/ 1	1.90	X	1.06	1.00	Yes	Yes	Yes	0.00			
Metals	Beryllium	mg/kg	7440-41-7	28/ 40	0.89	X	0.46	21.00	Yes	Yes	Yes	420.00	668.01	25.33	1222.52
Metals	Calcium	mg/kg	7440-70-2	40/ 40	16710.00	X	9711.00	7.00	Yes	Yes	Yes	42.00	347.22	15.58	886.14
Metals	Magnesium	mg/kg	7439-95-4	40/ 40	4788.00	X	2672.00	17.00	Yes	Yes	Yes	272.00	654.62	25.33	1222.52
Metals	Selenium	mg/kg	7782-49-2	42/ 70	0.97	L	0.79	16.00	Yes	Yes	Yes	240.00	479.26	43.66	1181.95
Metals	Sodium	mg/kg	7440-23-5	15/ 40	315.30	D	278.90	4.00	Yes	Yes	Yes	12.00	301.59	25.33	582.26
Metals	Thallium	mg/kg	7440-28-0	28/ 40	0.92	X	0.54	20.00	Yes	Yes	Yes	380.00	594.87	23.23	1227.56
Preparation and Receiving Areas Aggregate															
Metals	Selenium	mg/kg	7782-49-2	5/ 17	0.99	D	0.69	3.00	Yes	No	Yes	6.00	328.99	242.75	464.25
Organics-Volatile	2-Butanone	mg/kg	78-93-3	1/ 5	0.01	D	0.01	1.00	Yes	Yes	Yes	0.00			
Packaging and Shipping Areas Aggregate															
Organics-Pesticide/PCB	Dieldrin	mg/kg	60-57-1	1/ 1	0.01	X	0.01	1.00	Yes	Yes	Yes	0.00			
Organics-Pesticide/PCB	Endrin aldehyde	mg/kg	7421-93-4	1/ 1	0.06	X	0.05	1.00	Yes	Yes	Yes	0.00			
Organics-Pesticide/PCB	Methoxychlor	mg/kg	72-43-5	1/ 1	0.03	X	0.01	1.00	Yes	Yes	Yes	0.00			
Organics-Pesticide/PCB	alpha-Chlordane	mg/kg	5103-71-9	1/ 1	0.01	X	0.01	1.00	Yes	Yes	Yes	0.00			
Perimeter Area Aggregate															
Metals	Lead	mg/kg	7439-92-1	24/ 24	123.40	X	21.00	10.00	Yes	Yes	Yes	90.00	1571.27	17.51	3828.24
Melt-Pour Area Drainage Ditches Aggregate															
Metals	Antimony	mg/kg	7440-36-0	1/ 7	0.87	D	0.65	1.00	Yes	Yes	Yes	0.00			
Metals	Copper	mg/kg	7440-50-8	7/ 7	14.00	N	12.23	5.00	Yes	Yes	Yes	20.00	199.44	13.46	391.74
Metals	Magnesium	mg/kg	7439-95-4	7/ 7	2601.00	N	1943.00	6.00	Yes	Yes	Yes	30.00	229.20	13.46	391.74
Metals	Zinc	mg/kg	7440-66-6	15/ 15	71.66	N	61.69	11.00	Yes	Yes	Yes	108.00	194.53	13.46	459.82

Appendix Table R-20. Load Line 4 Main Stream Segment Upstream of Perimeter Road Aggregate ESV Pre-Screening Table For Sediment at Ravenna, Ohio

Analytes that are SRCs	CAS Registry Number	Sediment Maximum Concentrations (mg/kg)	Preferred Ecological Screening Value (mg/kg)	Reference	Is Maximum above or below the Preferred Ecological Screening Value?	Is analyte a PBT compound?[a]	Analytes remaining after the EU specific ESV and PBT screen?[b]
Metals							
Beryllium	7440-41-7	5.60E-01	No ESV	No Source	no screening value	no	**yes**
Cadmium	7440-43-9	2.50E-01	9.90E-01	MacDonald et al. (2000)	below	yes	**yes**
Calcium	7440-70-2	1.39E+04	No ESV	No Source	no screening value	no	**yes**
Magnesium	7439-95-4	4.15E+03	No ESV	No Source	no screening value	no	**yes**
Organics-Explosives							
2,4,6-Trinitrotoluene	118-96-7	3.40E-01	No ESV	No Source	no screening value	no	**yes**
Organics-Volatile							
2-Butanone	78-93-3	1.10E-02	1.37E-01	EDQL EPA Region 5 (1998)	below	no	no
Acetone	67-64-1	3.90E-02	4.53E-01	EDQL EPA Region 5 (1998)	below	no	no
Toluene	108-88-3	3.80E-03	5.25E+01	EDQL EPA Region 5 (1998)	below	no	no

SRCs = Site Related Chemicals
CAS = Chemical Abstracts Service
Max = Maximum Detected Concentration (mg/kg)
PBT = Persistent, bioaccumulative, and toxic pollutants (If PBT, analyte is retained even if concentration is below ESV)
EU = Exposure Unit
ESV = Preferred Ecological Screening Value

[a]**Yes** = BAF $\geq$ 2 for metals or log Kow $\geq$ 4 for organics; else, no

[b]**Yes** = Max > preferred ecological screening value or no ecological screening value; No = Max < preferred ecological screening value

Appendix Table R-21. Load Line 4 Main Stream Segment and Settling Pond Aggregate ESV Pre-Screening Table For Sediment at Ravenna, Ohio

Analytes that are SRCs	CAS Registry Number	Sediment Maximum Concentrations (mg/kg)	Preferred Ecological Screening Value (mg/kg)	Reference	Is Maximum above or below the Preferred Ecological Screening Value?	Is analyte a PBT compound?[a]	Analytes remaining after the EU specific ESV and PBT screen?[b]
Metals							
Aluminum	7429-90-5	1.65E+04	No ESV	No Source	no screening value	no	**yes**
Barium	7440-39-3	1.63E+02	No ESV	No Source	no screening value	no	**yes**
Cadmium	7440-43-9	1.00E+00	9.90E-01	MacDonald et al. (2000)	above	yes	**yes**
Calcium	7440-70-2	6.71E+03	No ESV	No Source	no screening value	no	**yes**
Chromium	7440-47-3	2.15E+01	4.34E+01	MacDonald et al. (2000)	below	no	no
Cobalt	7440-48-4	1.68E+01	5.00E+01	EDQL EPA Region 5 (1998)	below	no	no
Copper	7440-50-8	3.12E+01	3.16E+01	MacDonald et al. (2000)	below	no	no
Iron	7439-89-6	3.94E+04	No ESV	No Source	no screening value	no	**yes**
Lead	7439-92-1	2.77E+01	3.58E+01	MacDonald et al. (2000)	below	yes	**yes**
Magnesium	7439-95-4	4.22E+03	No ESV	No Source	no screening value	no	**yes**
Mercury	7487-94-6	1.30E-01	1.80E-01	MacDonald et al. (2000)	below	yes	**yes**
Nickel	7440-02-0	3.34E+01	2.27E+01	MacDonald et al. (2000)	above	no	**yes**
Thallium	6533-73-9	2.70E+00	No ESV	No Source	no screening value	no	**yes**
Vanadium	7440-62-2	2.70E+01	No ESV	No Source	no screening value	no	**yes**
Organics-Explosives							
2,4,6-Trinitrotoluene	118-96-7	4.20E-01	No ESV	No Source	no screening value	no	**yes**
Organics-Volatile							
2-Butanone	78-93-3	1.10E-01	1.37E-01	EDQL EPA Region 5 (1998)	below	no	no
Acetone	67-64-1	4.10E-01	4.53E-01	EDQL EPA Region 5 (1998)	below	no	no

SRCs = Site Related Chemicals
CAS = Chemical Abstracts Service
Max = Maximum Detected Concentration (mg/kg)
PBT = Persistent, bioaccumulative, and toxic pollutants (If PBT, analyte is retained even if concentration is below ESV)
EU = Exposure Unit
ESV = Preferred Ecological Screening Value

[a]**Yes** = BAF $\geq$ 2 for metals or log Kow $\geq$ 4 for organics; else, no

[b]**Yes** = Max > preferred ecological screening value or no ecological screening value; No = Max < preferred ecological screening value

Appendix Table R-22. Load Line 4 Exit Drainage Aggregate ESV Pre-Screening Table For Sediment at Ravenna, Ohio

Analytes that are SRCs	CAS Registry Number	Sediment Maximum Concentrations (mg/kg)	Preferred Ecological Screening Value (mg/kg)	Reference	Is Maximum above or below the Preferred Ecological Screening Value?	Is analyte a PBT compound?[a]	Analytes remaining after the EU specific ESV and PBT screen?[b]
Metals							
Cadmium	7440-43-9	3.60E-01	9.90E-01	MacDonald et al. (2000)	below	yes	**yes**
Chromium, hexavalent	18540-29-9	1.40E+00	4.34E+01	MacDonald et al. (2000)	below	no	no
Organics-Pesticide/PCB							
PCB-1248	12672-29-6	9.00E-02	3.41E-01	EDQL EPA Region 5 (1998)[c]	below	yes	**yes**

SRCs = Site Related Chemicals
CAS = Chemical Abstracts Service
Max = Maximum Detected Concentration (mg/kg)
PBT = Persistent, bioaccumulative, and toxic pollutants (If PBT, analyte is retained even if concentration is below ESV)
EU = Exposure Unit
ESV = Preferred Ecological Screening Value

[a]**Yes** = BAF $\geq$ 2 for metals or log Kow $\geq$ 4 for organics; else, no

[b]**Yes** = Max > preferred ecological screening value or no ecological screening value; No = Max < preferred ecological screening value

Appendix Table R-23. Load Line 4 Main Stream Segment Upstream of Perimeter Road Aggregate ESV Pre-Screening Table For Surface Water at Ravenna, Ohio

Analytes that are SRCs	CAS Registry Number	Surface Water Maximum Concentrations (µg/L)	Preferred Ecological Screening Value (µg/L)	Reference	Is Max above or below the Preferred Ecological Screening Value?	Is analyte a PBT compound?[a]	Analytes remaining after the EU specific ESV and PBT screen?[b]
Metals							
Arsenic	7440-38-2	7.10E+00	1.50E+02	Ohio Administrative Code	below	no	no
Barium	7440-39-3	5.90E+01	2.20E+02	Ohio Administrative Code	below	no	no
Cadmium	7440-43-9	3.00E-01	2.20E+00	Ohio Administrative Code	below	yes	**yes**
Calcium	7440-70-2	6.20E+04	No ESV	No Source	no screening value	no	**yes**
Iron	7439-89-6	4.60E+03	1.00E+03	NAWQC (Suter & Tsao 1996)	above	no	**yes**
Magnesium	7439-95-4	1.70E+04	No ESV	No Source	no screening value	no	**yes**
Manganese	7439-96-5	3.60E+03	1.60E+03	Ohio Administrative Code	above	no	**yes**
Mercury	7439-97-6	7.80E-02	9.10E-01	Ohio Administrative Code	below	yes	**yes**
Potassium	7440-09-7	3.30E+03	No ESV	No Source	no screening value	no	**yes**
Vanadium	7440-62-2	9.90E-01	4.40E+01	Ohio Administrative Code	below	no	no

SRCs = Site Related Chemicals
CAS = Chemical Abstracts Service
Max = Maximum Detected Concentration (µg/L)
PBT = Persistent, bioaccumulative, and toxic pollutants (If PBT, analyte is retained even if concentration is below ESV)
EU = Exposure Unit
ESV = Preferred Ecological Screening Value
[a]**Yes** = BAF $\geq$ 2 for metals or log Kow $\geq$ 4 for organics; else, no
[b]**Yes** = Max > preferred ecological screening value or no ecological screening value; No = Max < preferred ecological screening value

Appendix Table R-24. Load Line 4 Main Stream Segment and Settling Pond Aggregate ESV Pre-Screening Table For Surface Water at Ravenna, Ohio

Analytes that are SRCs	CAS Registry Number	Surface Water Maximum Concentrations (µg/L)	Preferred Ecological Screening Value (µg/L)	Reference	Is Max above or below the Preferred Ecological Screening Value?	Is analyte a PBT compound?[a]	Analytes remaining after the EU specific ESV and PBT screen?[b]
Metals							
Manganese	7439-96-5	5.10E+02	1.60E+03	Ohio Administrative Code	below	no	no
Mercury	7439-97-6	9.20E-02	9.10E-01	Ohio Administrative Code	below	yes	**yes**
Vanadium	7440-62-2	1.80E+00	4.40E+01	Ohio Administrative Code	below	no	no
Organics-Pesticides							
4,4'-DDT	50-29-3	3.10E-01	1.30E-02	Tier II (Suter & Tsao 1996)	above	yes	**yes**
Organics-Volatile							
Acetone	67-64-1	3.10E+00	1.50E+03	Tier II (Suter & Tsao 1996)	below	no	no

SRCs = Site Related Chemicals
CAS = Chemical Abstracts Service
Max = Maximum Detected Concentration (µg/L)
PBT = Persistent, bioaccumulative, and toxic pollutants (If PBT, analyte is retained even if concentration is below ESV)
EU = Exposure Unit
ESV = Preferred Ecological Screening Value
[a]**Yes** = BAF $\geq$ 2 for metals or log Kow $\geq$ 4 for organics; else, no
[b]**Yes** = Max > preferred ecological screening value or no ecological screening value; No = Max < preferred ecological screening value

Appendix Table R-25. Load Line 4 Exit Drainage Aggregate ESV Pre-Screening Table For Surface Water at Ravenna, Ohio

Analytes that are SRCs	CAS Registry Number	Surface Water Maximum Concentrations (µg/L)	Preferred Ecological Screening Value (µg/L)	Reference	Is Max above or below the Preferred Ecological Screening Value?	Is analyte a PBT compound?[a]	Analytes remaining after the EU specific ESV and PBT screen?[b]
Metals							
Antimony	7440-36-0	2.50E+00	1.90E+02	Ohio Administrative Code	below	no	no
Calcium	7440-70-2	5.30E+04	No ESV	No Source	no screening value	no	**yes**
Magnesium	7439-95-4	1.20E+04	No ESV	No Source	no screening value	no	**yes**
Vanadium	7440-62-2	1.40E+00	4.40E+01	Ohio Administrative Code	below	no	no
Organics-Volatile							
Acetone	67-64-1	1.2E+00	1.50E+03	Tier II (Suter & Tsao 1996)	below	no	no

SRCs = Site Related Chemicals
CAS = Chemical Abstracts Service
Max = Maximum Detected Concentration (µg/L)
PBT = Persistent, bioaccumulative, and toxic pollutants (If PBT, analyte is retained even if concentration is below ESV)
EU = Exposure Unit
ESV = Preferred Ecological Screening Value
[a]**Yes** = BAF $\geq$ 2 for metals or log Kow $\geq$ 4 for organics; else, no
[b]**Yes** = Max > preferred ecological screening value or no ecological screening value; No = Max < preferred ecological screening value

Appendix Table R-26. Receptor Parameters for Cottontail Rabbits

Parameter	Definition	Receptor: Eastern Cottontail *(Sylvilagus floridanus)* Value	Reference / Notes
BW	Body weight (kg)	1.22	Arithmetic mean of means, both sexes, all seasons (EPA 1993)
HR	Home range (ha)	3.1	(EPA 1993)
TUF	Temporal use factor	1	Will be 1 unless a specific value exists for a receptor
IR_F	Food ingestion rate (g/g-d = kg/kgBW/d)	0.2	Dalke and Slime (1941)
PF	Plant fraction	0.94	Exclusively herbivorous, assumed to be vegetative parts (EPA 1993)
AF	Animal fraction	0	Not stated in EPA (1993), assumed to be 0
SF	Soil fraction	0.063	Assumed comparable to that for black-tailed jackrabbit (6.3%) (Arthur and Gates 1988)
IR_w	Water ingestion rate (g/g-d = L/kgBW/d)	0.097	(EPA 1993)

[a] Food ingestion rate (g/g-d) reexpressed as kg/kgBW/d is assumed not to include ingested soil; therefore, PF+AF = 1.0

Appendix Table R-27. Receptor Parameters for Short-tailed shrew

Parameter	Definition	Receptor: Short-tailed shrew *(Blarina brevicauda)* Value	Reference / Notes
BW	Body weight (kg)	0.017	Arithmetic mean of means, both sexes, fall and summer, western Pennsylvania (EPA 1993)
HR	Home range (ha)	0.1	Minimum, adult and juveniles, Michigan and New York (EPA 1993)
TUF	Temporal use factor	1	Will be 1 unless a specific value exists for a receptor
IR_F	Food ingestion rate (g/g-d = kg/kgBW/d)	0.56	Arithmetic mean of adults, both sexes, 25oC, Wisconsin (EPA 1993)
PF	Plant fraction	0.13	June through October, New York (EPA 1993); assuming vegetative parts and fungi
AF	Animal fraction	0.87	June through October, New York (EPA 1993); assuming 100% earthworms
SF	Soil fraction	0.06	EPA (1999)
IR_w	Water ingestion rate (g/g-d = L/kgBW/d)	0.223	Adult, both sexes, Illinois, lab (EPA 1993)

[a] Food ingestion rate (g/g-d) reexpressed as kg/kgBW/d is assumed not to include ingested soil; therefore, PF+AF = 1.0

Appendix Table R-28. Receptor Parameters for Red Fox

Parameter	Definition	Receptor: Red fox *(Vulpes vulpes)* Value	Reference / Notes
BW	Body weight (kg)	4.535	Arithmetic average of means, both sexes, (EPA 1993)
HR	Home range (ha)	504	Arithmetic mean, adult, both sexes, Minnesota and Wisconsin (EPA 1993)
TUF	Temporal use factor	1	Will be 1 unless a specific value exists for a receptor
IR_F	Food ingestion rate (g/g-d = kg/kgBW/d)[a]	0.095	Adult, non-breeding, North Dakota (EPA 1993)
PF	Plant fraction	0.046	Illinois farm/woods, spring, % wet weight (EPA 1993); assumed to be reproductive parts
AF	Animal fraction	0.954	Illinois farm/woods, spring, % wet weight, including unspecified/other (EPA 1993)
SF	Soil fraction	0.028	Estimated percent soil in diet, dry weight (EPA 1993)
IR_w	Water ingestion rate (g/g-d = L/kgBW/d)	0.085	Arithmetic mean, adult, both sexes (EPA 1993)

[a] Food ingestion rate (g/g-d) reexpressed as kg/kgBW/d is assumed not to include ingested soil; therefore, PF+AF = 1.0

Appendix Table R-29. Receptor Parameters for Red-tailed Hawk

Parameter	Definition	Receptor: Red-tailed hawk *(Buteo jamaicensis)* Value	Reference / Notes
BW	Body weight (kg)	1.134	Arithmetic mean, female and male, Michigan (EPA 1993)
HR	Home range (ha)	876	Mean, adults, both sexes, (EPA 1993)
TUF	Temporal use factor	1	Will be 1 unless a specific value exists for a receptor
IR_F	Food ingestion rate (g/g-d = kg/kgBW/d)[a]	0.11	Adult female, winter, Michigan, captive outdoors (EPA 1993)
PF	Plant fraction	0	Not stated in EPA (1993); assumed to be negligible
AF	Animal fraction	1	Prey brought to nests (EPA 1993)
SF	Soil fraction	0	Not stated in EPA (1993) and Beyer et al. (1994); assumed to be negligible.
IR_w	Water ingestion rate (g/g-d = L/kgBW/d)	0.057	Arithmetic mean, both sexes, estimated (EPA 1993)

[a] Food ingestion rate (g/g/-d) reexpressed as kg/kgBW/d is assumed not to include ingested soil; therefore, PF+AF = 1.0

Appendix Table R-30. Receptor Parameters for Muskrats[a]

Parameter	Definition	Receptor: Value	Muskrat *(Odatra zibethicus)* Reference / Notes
BW	Body weight (kg)	1.174	Arithmetic mean of means, adult, both sexes, all seasons (EPA 1993)
IR_F	Food ingestion rate (g/g-day = kg/kgBW/day)	0.3	Arithmetic mean of means (EPA 1993)
PF	Plant fraction	1	Exclusively herbivorous, assumed to be vegetative parts (EPA 1993)
AF	Animal fraction	0	Assumed to be negligible
SF	Sediment fraction	0	Assumed to be negligible
IR_w	Water ingestion rate (g/g-day = L/kgBW/day)	0.98	Estimated (EPA 1993)
HR	Home range (ha)	0.13	Arithmetic mean of means (EPA 1993)
TUF	Temporal use factor	1	Assumed to be present year-round

[a] Values and references as presented in *Ecological Risk Assessment Guidance Document* (Ohio EPA 2003)

Appendix Table R-31. Receptor Parameters for Mallard Ducks[a]

Parameter	Definition	Receptor: Mallard duck *(Anas platyrhynchos)* Value	Reference / Notes
BW	Body weight (kg)	1.162	Arithmetic mean of means, adult, both sexes, all seasons (EPA 1993)
IR_F	Food ingestion rate (g/g-day = kg/kgBW/day)	0.063	Estimated based on $F=0.648(bw)^{0.651}$, ingestion rate for birds (Opresko et al. 1994)
PF	Plant fraction	0.98	Assumed to be a 50% mixture of vegetation and fruit/seed
AF	Animal fraction	0	Assumed to be negligible
SF	Sediment fraction	0.03	Beyer et al. 1994
IR_w	Water ingestion rate (g/g-day = L/kgBW/day)	0.057	Estimated (EPA 1993)
HR	Home range (ha)	435	Arithmetic mean of means, adult, both sexes, spring (EPA 1993)
TUF	Temporal use factor	1	Assumed to be present year-round

[a] Values and references as presented in *Ecological Risk Assessment Guidance Document* (Ohio EPA 2003)

Appendix Table R-32. Receptor Parameters for Mink[a]

Parameter	Definition	Receptor: Mink *(Mustela vison)* Value	Reference / Notes
BW	Body weight (kg)	1.02	Arithmetic mean of means, adult, both sexes, Montana (EPA 1993)
IR_F	Food ingestion rate (g/g-day = kg/kgBW/day)	0.16	Arithmetic mean of means, adult, both sexes (EPA 1993)
PF	Plant fraction	0	Assumed to be negligible
AF	Animal fraction	1	Assumed to be fish, may also include site-specific prey items (EPA 1993)
SF	Soil fraction	0	Assumed to be negligible
IR_w	Water ingestion rate (g/g-day = L/kgBW/day)	0.08	Arithmetic man of means, both sexes (EPA 1993)
HR	Home range	470 ha	Arithmetic mean of means, adult, both sexes (EPA 1993)
		2.24 km	Foraging length of stream, mean of means, aadult, both sexes (EPA 1993)
TUF	Temporal use factor	1	Assumed to be present year-round; however, site-specific or other information may be used to estimate a site-specific TUF

[a] Values and references as presented in *Ecological Risk Assessment Guidance Document* (Ohio EPA 2003)

Appendix Table R-33. Receptor Parameters for Great Blue Herons [a]

Parameter	Definition	Receptor: Great Blue Heron *(Ardea herodias)* Value	Reference / Notes
BW	Body weight (kg)	2.336	Arithmetic mean of means, adult, both sexes (EPA 1993)
IR_F	Food ingestion rate (g/g-day = kg/kgBW/day)	0.18	Mean, adults, both sexes (EPA 1993)
PF	Plant fraction	0	Assumed to be negligible
AF	Animal fraction	1	Assumed to be fish, may also include site-specific prey items (EPA 1993)
SF	Soil fraction	0	Assumed to be negligible
IR_w	Water ingestion rate (g/g-day = L/kgBW/day)	0.045	Estimated (EPA 1993)
HR	Home range	0.6 ha 3.1 km	Size of feeding area only (EPA 1993) or forage area (lenth of shoreline ,km)
TUF	Temporal use factor	1	Assumed to be present year-round; however, site-specific or other information may be used to estimate a site-specific TUF

[a] Values and references as presented in *Ecological Risk Assessment Guidance Document* (Ohio EPA 2003)

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	Log K_{oc} [a]	SPv (kg dry soil/kg dry tissue)	Source	SPr (kg dry soil/kg dry tissue)	Source
Organic Compounds							
Aromatic Nonhalogenated Hydrocarbons							
2-Nitrotoluene	88-72-2	2.30	2.63	1.81E+00	Equation 1	1.81E+00	Equation 1
4-Nitrobiphenyl	92-93-3	3.77	3.09	2.56E-01	Equation 1	2.56E-01	Equation 1
Benzaldehyde	100-52-7	1.48	1.30	5.42E+00	Equation 1	5.42E+00	Equation 1
Benzene	71-43-2	2.14	1.79	2.25E+00	Equation 1	2.25E+00	Equation 1
Benzyl alcohol	100-51-6	1.10	1.01	8.95E+00	Equation 1	8.95E+00	Equation 1
Ethyl benzene	100-41-4	3.12	2.31	6.06E-01	Equation 1	6.06E-01	Equation 1
m-Xylene	108-38-3	3.20	2.29	5.47E-01	Equation 1	5.47E-01	Equation 1
o-Xylene	95-47-6	3.13	2.38	6.01E-01	Equation 1	6.01E-01	Equation 1
p-Xylene	106-42-3	3.17	2.49	5.70E-01	Equation 1	5.70E-01	Equation 1
Styrene	100-42-5	2.93	2.96	7.85E-01	Equation 1	7.85E-01	Equation 1
Toluene	108-88-3	2.67	2.15	1.11E+00	Equation 1	1.11E+00	Equation 1
Non-aromatic Nonhalogenated Hydrocarbons							
1-Nitropropane	108-03-2	0.87	0.83	1.22E+01	Equation 1	1.22E+01	Equation 1
2,2,4-Trimethylpentane	540-84-1	5.02	4.07	4.86E-02	Equation 1	4.86E-02	Equation 1
2-Butanone	78-93-3	0.28	0.37	2.66E+01	Equation 1	2.66E+01	Equation 1
2-Hexanone	591-78-6	1.38	2.13	6.17E+00	Equation 1	6.17E+00	Equation 1
2-Methoxyethanol	109-86-4	-0.77	0.00	1.08E+02	Equation 1	1.08E+02	Equation 1
2-Methyl-2-propanol	75-65-0	0.35	1.57	2.43E+01	Equation 1	2.43E+01	Equation 1
2-Propanone (Acetone)	67-64-1	-0.22	-0.02	5.20E+01	EPA (1999a)	5.20E+01	EPA (1999a)
2-Propene-1-ol	107-18-6	0.17	0.28	3.09E+01	Equation 1	3.09E+01	Equation 1
2-Propyl alcohol	67-63-0	0.05	0.19	3.62E+01	Equation 1	3.62E+01	Equation 1
3-Heptanone	106-35-4	NA	NA	No data	No data	No data	No data
3-Methyl-1-butanol	123-51-3	NA	NA	No data	No data	No data	No data
3-Methyl-2-butanone	563-80-4	NA	NA	No data	No data	No data	No data
3-Pentanone	96-22-0	0.99	1.08	1.04E+01	Equation 1	1.04E+01	Equation 1

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	BAF-S (kg dry soil/ kg tissue)	Source	Mammal Ba ([mg/kg tissue] / [mg ingested /day])	Source
Organic Compounds					
Aromatic Nonhalogenated Hydrocarbons					
2-Nitrotoluene	88-72-2	2.20E-04	Equation 2	5.01E-06	Equation 3
4-Nitrobiphenyl	92-93-3	2.78E-04	Equation 2	1.48E-04	Equation 3
Benzaldehyde	100-52-7	1.92E-04	Equation 2	7.54E-07	Equation 3
Benzene	71-43-2	2.14E-04	Equation 2	3.44E-06	Equation 3
Benzyl alcohol	100-51-6	1.81E-04	Equation 2	3.16E-07	Equation 3
Ethyl benzene	100-41-4	2.51E-04	Equation 2	3.34E-05	Equation 3
m-Xylene	108-38-3	2.54E-04	Equation 2	3.99E-05	Equation 3
o-Xylene	95-47-6	2.51E-04	Equation 2	3.39E-05	Equation 3
p-Xylene	106-42-3	2.53E-04	Equation 2	3.72E-05	Equation 3
Styrene	100-42-5	2.43E-04	Equation 2	2.13E-05	Equation 3
Toluene	108-88-3	2.33E-04	Equation 2	1.17E-05	Equation 3
Non-aromatic Nonhalogenated Hydrocarbons					
1-Nitropropane	108-03-2	1.74E-04	Equation 2	1.86E-07	Equation 3
2,2,4-Trimethylpentane	540-84-1	3.40E-04	Equation 2	2.63E-03	Equation 3
2-Butanone	78-93-3	1.59E-04	Equation 2	4.80E-08	Equation 3
2-Hexanone	591-78-6	1.89E-04	Equation 2	6.03E-07	Equation 3
2-Methoxyethanol	109-86-4	1.34E-04	Equation 2	4.27E-09	Equation 3
2-Methyl-2-propanol	75-65-0	1.60E-04	Equation 2	5.62E-08	Equation 3
2-Propanone (Acetone)	67-64-1	5.00E-02	EPA (1999a)	1.51E-08	Equation 3
2-Propene-1-ol	107-18-6	1.56E-04	Equation 2	3.72E-08	Equation 3
2-Propyl alcohol	67-63-0	1.53E-04	Equation 2	2.82E-08	Equation 3
3-Heptanone	106-35-4	No data	No data	No data	No data
3-Methyl-1-butanol	123-51-3	No data	No data	No data	No data
3-Methyl-2-butanone	563-80-4	No data	No data	No data	No data
3-Pentanone	96-22-0	1.78E-04	Equation 2	2.45E-07	Equation 3

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	Log K_{oc} [a]	SPv (kg dry soil/kg dry tissue)	Source	SPr (kg dry soil/kg dry tissue)	Source
4-Heptanone	123-19-3	NA	NA	No data	No data	No data	No data
4-Methyl-2-pentanone	108-10-1	1.19	1.08	7.94E+00	Equation 1	7.94E+00	Equation 1
Acetaldehyde	75-07-0	-0.22	-0.02	5.19E+01	Equation 1	5.19E+01	Equation 1
Acetamide	60-35-5	-1.26	-1.55	2.07E+02	Equation 1	2.07E+02	Equation 1
Acetic acid	64-19-7	-0.17	0.00	4.86E+01	Equation 1	4.86E+01	Equation 1
Acetic acid ethyl ester	141-78-6	0.73	0.36	1.47E+01	Equation 1	1.47E+01	Equation 1
Acetic acid n-butyl ester	123-86-4	1.73	1.50	3.87E+00	Equation 1	3.87E+00	Equation 1
Acetonitrile	75-05-8	-0.34	-0.11	6.09E+01	Equation 1	6.09E+01	Equation 1
Acrolein	107-02-8	-0.01	0.14	3.92E+01	Equation 1	3.92E+01	Equation 1
Acrylonitrile	107-13-1	0.25	0.35	2.78E+01	EPA (1999a)	2.78E+01	EPA (1999a)
Non-aromatic Halogenated Hydrocarbons							
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	3.41	2.54	4.14E-01	Equation 1	4.14E-01	Equation 1
1,1,1,2-Tetrachloroethane	630-20-6	2.63	2.20	1.17E+00	Equation 1	1.17E+00	Equation 1
1,1,1-Trichloroethane	71-55-6	2.42	5.13	1.54E+00	Equation 1	1.54E+00	Equation 1
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	3.73	2.50	2.70E-01	Equation 1	2.70E-01	Equation 1
1,1,2,2-Tetrachloroethane	79-34-5	4.64	1.90	8.02E-02	Equation 1	8.02E-02	Equation 1
1,1,2,2-Tetrachloroethene	127-18-4	2.55	2.42	1.31E+00	Equation 1	1.31E+00	Equation 1
1,1,2-Trichloroethane	79-00-5	2.10	1.88	2.38E+00	Equation 1	2.38E+00	Equation 1
1,1,2-Trichloroethylene	79-01-6	2.43	1.97	1.52E+00	Equation 1	1.52E+00	Equation 1
1,1-Dichloroethane	75-34-3	1.79	1.72	3.56E+00	Equation 1	3.56E+00	Equation 1
1,1-Dichloroethene	75-35-4	2.12	1.81	2.30E+00	Equation 1	2.30E+00	Equation 1
1,2-Dichloroethane	107-06-2	1.46	1.29	5.53E+00	Equation 1	5.53E+00	Equation 1
1,2-Dichloroethylene	540-59-0	2.09	1.64	2.40E+00	Equation 1	2.40E+00	Equation 1
1,2-Dichloropropane	78-87-5	2.25	1.67	1.94E+00	Equation 1	1.94E+00	Equation 1
1,3-Dichloropropene	542-75-6	1.75	1.43	3.78E+00	Equation 1	3.78E+00	Equation 1
Carbon tetrachloride	56-23-5	2.72	2.18	1.04E+00	EPA (1999a)	1.04E+00	EPA (1999a)
Chlorodibromomethane	124-48-1	2.18	1.85	2.14E+00	Equation 1	2.14E+00	Equation 1

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	BAF-S (kg dry soil/ kg tissue)	Source	Mammal Ba ([mg/kg tissue] / [mg ingested /day])	Source
4-Heptanone	123-19-3	No data	No data	No data	No data
4-Methyl-2-pentanone	108-10-1	1.84E-04	Equation 2	3.89E-07	Equation 3
Acetaldehyde	75-07-0	1.46E-04	Equation 2	1.51E-08	Equation 3
Acetamide	60-35-5	1.24E-04	Equation 2	1.38E-09	Equation 3
Acetic acid	64-19-7	1.47E-04	Equation 2	1.70E-08	Equation 3
Acetic acid ethyl ester	141-78-6	1.70E-04	Equation 2	1.35E-07	Equation 3
Acetic acid n-butyl ester	123-86-4	2.00E-04	Equation 2	1.35E-06	Equation 3
Acetonitrile	75-05-8	1.43E-04	Equation 2	1.15E-08	Equation 3
Acrolein	107-02-8	1.51E-04	Equation 2	2.46E-08	Equation 3
Acrylonitrile	107-13-1	1.10E-01	EPA (1999a)	4.47E-08	Equation 3
Non-aromatic Halogenated Hydrocarbons					
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	2.63E-04	Equation 2	6.46E-05	Equation 3
1,1,1,2-Tetrachloroethane	630-20-6	2.32E-04	Equation 2	1.07E-05	Equation 3
1,1,1-Trichloroethane	71-55-6	2.24E-04	Equation 2	6.63E-06	Equation 3
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	2.76E-04	Equation 2	1.35E-04	Equation 3
1,1,2,2-Tetrachloroethane	79-34-5	3.20E-04	Equation 2	1.11E-03	Equation 3
1,1,2,2-Tetrachloroethene	127-18-4	2.28E-04	Equation 2	8.82E-06	Equation 3
1,1,2-Trichloroethane	79-00-5	2.12E-04	Equation 2	3.14E-06	Equation 3
1,1,2-Trichloroethylene	79-01-6	2.24E-04	Equation 2	6.81E-06	Equation 3
1,1-Dichloroethane	75-34-3	2.02E-04	Equation 2	1.56E-06	Equation 3
1,1-Dichloroethene	75-35-4	2.13E-04	Equation 2	3.32E-06	Equation 3
1,2-Dichloroethane	107-06-2	1.92E-04	Equation 2	7.28E-07	Equation 3
1,2-Dichloroethylene	540-59-0	2.12E-04	Equation 2	3.09E-06	Equation 3
1,2-Dichloropropane	78-87-5	2.18E-04	Equation 2	4.47E-06	Equation 3
1,3-Dichloropropene	542-75-6	2.01E-04	Equation 2	1.41E-06	Equation 3
Carbon tetrachloride	56-23-5	1.20E+01	EPA (1999a)	1.31E-05	Equation 3
Chlorodibromomethane	124-48-1	2.15E-04	Equation 2	3.77E-06	Equation 3

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	Log K_{oc} [a]	SPv (kg dry soil/kg dry tissue)	Source	SPr (kg dry soil/kg dry tissue)	Source
Chlorodifluoromethane	75-45-6	1.08	0.99	9.21E+00	Equation 1	9.21E+00	Equation 1
Chloroethane	75-00-3	3.10	2.57	6.25E-01	Equation 1	6.25E-01	Equation 1
Chloroform	67-66-3	1.95	1.72	2.90E+00	EPA (1999a)	2.90E+00	EPA (1999a)
Chloromethane	74-87-3	0.90	0.78	1.16E+01	Equation 1	1.16E+01	Equation 1
Methylene bromide	74-95-3	1.62	1.41	4.48E+00	Equation 1	4.48E+00	Equation 1
Pentachloroethane	76-01-7	3.05	2.53	6.68E-01	Equation 1	6.68E-01	Equation 1
trans-1,2-Dichloroethylene	156-60-5	1.98	1.58	2.77E+00	Equation 1	2.77E+00	Equation 1
trans-1,3-Dichloropropene	10061-02-6	2.06	1.76	2.50E+00	Equation 1	2.50E+00	Equation 1
Trichloroacetic acid	76-03-9	1.33	1.19	6.60E+00	Equation 1	6.60E+00	Equation 1
Dioxin and Furan Compounds (PCDDs/PCDFs)							
Dibenzofuran	132-64-9	4.33	4.12	1.22E-01	Equation 1	1.22E-01	Equation 1
Polychlorinated Biphenyls (PCBs)							
Aroclor-1254		6.29	4.65	8.96E-03	Equation 1	8.96E-03	Equation 1
Polychlorinated biphenyls (PCBs)[f]	1336-36-3	6.29	4.65	8.96E-03	Equation 1	8.96E-03	Equation 1
Phthalates							
Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7	5.20	5.05	3.80E-02	EPA (1999a)	3.80E-02	EPA (1999a)
Butylbenzyl phthalate	85-68-7	4.41	4.14	1.09E-01	Equation 1	1.09E-01	Equation 1
Dibutyl phthalate	84-74-2	4.72	3.20	7.24E-02	Equation 1	7.24E-02	Equation 1
Diethyl phthalate	84-66-2	4.44	1.91	1.06E-01	Equation 1	1.06E-01	Equation 1
Dimethyl phthalate	131-11-3	1.63	1.49	4.40E+00	Equation 1	4.40E+00	Equation 1
n-Dioctyl phthalate	117-84-0	9.33	8.96	1.57E-04	EPA (1999a)	1.57E-04	EPA (1999a)

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	BAF-S (kg dry soil/ kg tissue)	Source	Mammal Ba ([mg/kg tissue] / [mg ingested /day])	Source
Chlorodifluoromethane	75-45-6	1.80E-04	Equation 2	3.01E-07	Equation 3
Chloroethane	75-00-3	2.50E-04	Equation 2	3.16E-05	Equation 3
Chloroform	67-66-3	2.82E+00	EPA (1999a)	2.24E-06	Equation 3
Chloromethane	74-87-3	1.75E-04	Equation 2	2.01E-07	Equation 3
Methylene bromide	74-95-3	1.97E-04	Equation 2	1.05E-06	Equation 3
Pentachloroethane	76-01-7	2.48E-04	Equation 2	2.82E-05	Equation 3
trans-1,2-Dichloroethylene	156-60-5	2.09E-04	Equation 2	2.41E-06	Equation 3
trans-1,3-Dichloropropene	10061-02-6	2.11E-04	Equation 2	2.88E-06	Equation 3
Trichloroacetic acid	76-03-9	1.88E-04	Equation 2	5.37E-07	Equation 3
Dioxin and Furan Compounds (PCDDs/PCDFs)					
Dibenzofuran	132-64-9	3.04E-04	Equation 2	5.37E-04	Equation 3
Polychlorinated Biphenyls (PCBs)					
Aroclor-1254		8.91E+00	Sample et al. 1999	4.90E-02	Equation 3
Polychlorinated biphenyls (PCBs)[b]	1336-36-3	1.13E+00	EPA (1999a)	4.90E-02	Equation 3
Phthalates					
Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7	1.31E+03	EPA (1999a)	4.02E-03	Equation 3
Butylbenzyl phthalate	85-68-7	3.09E-04	Equation 2	6.51E-04	Equation 3
Dibutyl phthalate	84-74-2	3.24E-04	Equation 2	1.32E-03	Equation 3
Diethyl phthalate	84-66-2	3.10E-04	Equation 2	6.86E-04	Equation 3
Dimethyl phthalate	131-11-3	1.97E-04	Equation 2	1.08E-06	Equation 3
n-Dioctyl phthalate	117-84-0	6.82E-04	Equation 2	5.37E+01	Equation 3

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	Log K_{oc} [a]	SPv (kg dry soil/kg dry tissue)	Source	SPr (kg dry soil/kg dry tissue)	Source
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)							
2-Methyl naphthalene	91-57-6	3.86	3.65	2.27E-01	Equation 1	2.27E-01	Equation 1
5-Nitroacenaphthene	602-87-9	NA	NA	No data	No data	No data	No data
Acenaphthene	83-32-9	3.96	3.69	1.98E-01	Equation 1	1.98E-01	Equation 1
Acenaphthylene	208-96-8	4.07	3.83	1.72E-01	Equation 1	1.72E-01	Equation 1
Anthracene	120-12-7	4.47	4.37	1.01E-01	Equation 1	1.01E-01	Equation 1
Fluorene	86-73-7	4.17	3.89	1.51E-01	Equation 1	1.51E-01	Equation 1
Indene	95-13-6	NA	NA	No data	No data	No data	No data
Naphthalene	91-20-3	3.37	3.08	4.35E-01	Equation 1	4.35E-01	Equation 1
Phenanthrene	85-01-8	4.55	4.32	9.08E-02	Equation 1	9.08E-02	Equation 1
Pyrene	129-00-0	5.00	4.83	4.99E-02	Equation 1	4.99E-02	Equation 1
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)							
3-Methylcholanthrene	56-49-5	7.11	6.18	3.01E-03	Equation 1	3.01E-03	Equation 1
5-Methylchrysene	3697-24-3	NA	NA	No data	No data	No data	No data
Benzo[a]anthracene	56-55-3	5.68	5.41	2.02E-02	EPA (1999a)	2.02E-02	EPA (1999a)
Benzo(a)pyrene	50-32-8	6.13	5.99	1.11E-02	EPA (1999a)	1.11E-02	EPA (1999a)
Benzo[a,i]pyrene	191-30-0	NA	NA	No data	No data	No data	No data
Benzo[b]fluoranthene	205-99-2	6.20	5.92	1.01E-02	EPA (1999a)	1.01E-02	EPA (1999a)
Benzo[e]pyrene	192-97-2	7.40	7.20	2.05E-03	Equation 1	2.05E-03	Equation 1
Benzo[g,h,i]perylene	191-24-2	7.10	6.26	3.05E-03	Equation 1	3.05E-03	Equation 1
Benzo[j]fluoranthene	205-82-3	6.44	6.15	7.34E-03	Equation 1	7.34E-03	Equation 1
Benzo[k]fluoranthene	207-08-9	6.19	5.92	1.01E-02	EPA (1999a)	1.01E-02	EPA (1999a)
Chrysene	218-01-9	5.74	5.47	1.87E-02	EPA (1999a)	1.87E-02	EPA (1999a)
Dibenz[a,h]acridine	226-36-8	NA	NA	No data	No data	No data	No data
Dibenz[a,h]anthracene	53-70-3	6.55	6.25	6.40E-03	EPA (1999a)	6.40E-03	EPA (1999a)
Dibenz[a,j]acridine	224-42-0	NA	NA	No data	No data	No data	No data
Dibenzo[a,e]fluoranthene	5385-75-1	NA	NA	No data	No data	No data	No data

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	BAF-S (kg dry soil/ kg tissue)	Source	Mammal Ba ([mg/kg tissue] / [mg ingested /day])	Source
Light Polycyclic Aromatic Hydrocarbons (mole wt <200 g/mole)					
2-Methyl naphthalene	91-57-6	2.82E-04	Equation 2	1.82E-04	Equation 3
5-Nitroacenaphthene	602-87-9	No data	No data	No data	No data
Acenaphthene	83-32-9	2.87E-04	Equation 2	2.32E-04	Equation 3
Acenaphthylene	208-96-8	2.92E-04	Equation 2	2.95E-04	Equation 3
Anthracene	120-12-7	3.11E-04	Equation 2	7.41E-04	Equation 3
Fluorene	86-73-7	2.97E-04	Equation 2	3.72E-04	Equation 3
Indene	95-13-6	No data	No data	No data	No data
Naphthalene	91-20-3	2.61E-04	Equation 2	5.93E-05	Equation 3
Phenanthrene	85-01-8	3.15E-04	Equation 2	8.92E-04	Equation 3
Pyrene	129-00-0	3.39E-04	Equation 2	2.51E-03	Equation 3
Heavy Polycyclic Aromatic Hydrocarbons (mole wt >200 g/mole)					
3-Methylcholanthrene	56-49-5	4.77E-04	Equation 2	3.24E-01	Equation 3
5-Methylchrysene	3697-24-3	No data	No data	No data	No data
Benzo[a]anthracene	56-55-3	3.00E-02	EPA (1999a)	1.20E-02	Equation 3
Benzo[a]pyrene	50-32-8	7.00E-02	EPA (1999a)	2.74E-02	EPA (1999a)
Benzo[a,i]pyrene	191-30-0	No data	No data	No data	No data
Benzo[b]fluoranthene	205-99-2	7.00E-02	EPA (1999a)	4.00E-02	Equation 3
Benzo[e]pyrene	192-97-2	4.99E-04	Equation 2	6.31E-01	Equation 3
Benzo[g,h,i]perylene	191-24-2	4.76E-04	Equation 2	3.16E-01	Equation 3
Benzo[j]fluoranthene	205-82-3	4.28E-04	Equation 2	6.92E-02	Equation 3
Benzo[k]fluoranthene	207-08-9	8.00E-02	EPA (1999a)	3.98E-02	Equation 3
Chrysene	218-01-9	4.00E-02	EPA (1999a)	1.38E-02	Equation 3
Dibenz[a,h]acridine	226-36-8	No data	No data	No data	No data
Dibenz[a,h]anthracene	53-70-3	7.00E-02	EPA (1999a)	8.86E-02	Equation 3
Dibenz[a,j]acridine	224-42-0	No data	No data	No data	No data
Dibenzo[a,e]fluoranthene	5385-75-1	No data	No data	No data	No data

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	Log K_{oc} [a]	SPv (kg dry soil/kg dry tissue)	Source	SPr (kg dry soil/kg dry tissue)	Source
Dibenzo[a,e]pyrene	192-65-4	NA	NA	No data	No data	No data	No data
Dibenzo[a,h]fluoranthene	No CAS #	NA	NA	No data	No data	No data	No data
Dibenzo[a,h]pyrene	189-64-0	NA	NA	No data	No data	No data	No data
Dibenzo[a,i]pyrene	189-55-9	7.29	6.98	2.37E-03	Equation 1	2.37E-03	Equation 1
Fluoranthene	206-44-0	5.08	4.69	4.47E-02	Equation 1	4.47E-02	Equation 1
Hexachloronaphthalene	1335-87-1	7.59	7.27	1.59E-03	Equation 1	1.59E-03	Equation 1
Indeno[1,2,3-cd]pyrene	193-39-5	6.91	6.61	3.90E-03	EPA (1999a)	3.90E-03	EPA (1999a)
Octachloronaphthalene	2234-13-1	6.42	6.13	7.54E-03	Equation 1	7.54E-03	Equation 1
Pentachloronaphthalene	1321-64-8	NA	NA	No data	No data	No data	No data
Tetrachloronaphthalene	1335-88-2	NA	NA	No data	No data	No data	No data
Trichloronaphthalene	1321-65-9	NA	NA	No data	No data	No data	No data
Light Substituted Benzene Compounds (molecular weight <200 g/mole)							
1,2,3-Trichlorobenzene	87-61-6	4.05	3.31	1.78E-01	Equation 1	1.78E-01	Equation 1
1,2,4-Trichlorobenzene	120-82-1	3.99	3.22	1.92E-01	Equation 1	1.92E-01	Equation 1
1,2,4-Trimethyl benzene	95-63-6	3.65	3.00	3.01E-01	Equation 1	3.01E-01	Equation 1
1,2-Dichlorobenzene	95-50-1	3.45	2.58	3.95E-01	Equation 1	3.95E-01	Equation 1
1,3,5-Trimethyl benzene	108-67-8	3.42	3.22	4.09E-01	Equation 1	4.09E-01	Equation 1
1,3-Dichlorobenzene	541-73-1	3.53	2.90	3.53E-01	Equation 1	3.53E-01	Equation 1
1,3-Dinitrobenzene	99-65-0	1.49	1.31	5.32E+00	EPA (1999a)	5.32E+00	EPA (1999a)
1,4-Dichlorobenzene	106-46-7	3.41	2.79	4.13E-01	Equation 1	4.13E-01	Equation 1
1,4-Dinitrobenzene	100-25-4	1.50	2.34	5.26E+00	Equation 1	5.26E+00	Equation 1
2,4,5-Trichlorophenol	95-95-4	3.87	3.05	2.25E-01	Equation 1	2.25E-01	Equation 1
2,4,6-Trichlorophenol	88-06-2	3.71	2.35	2.77E-01	Equation 1	2.77E-01	Equation 1
2,4-Dichlorophenol	120-83-2	3.04	2.14	6.80E-01	Equation 1	6.80E-01	Equation 1
2,4-Dimethylphenol	105-67-9	2.36	2.10	1.68E+00	Equation 1	1.68E+00	Equation 1
2,4-Dinitrophenol	51-28-5	1.52	-2.00	5.13E+00	Equation 1	5.13E+00	Equation 1
2,4-Dinitrotoluene	121-14-2	2.00	1.71	2.72E+00	EPA (1999a)	2.72E+00	EPA (1999a)

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	BAF-S (kg dry soil/ kg tissue)	Source	Mammal Ba ([mg/kg tissue] / [mg ingested /day])	Source
Dibenzo[a,e]pyrene	192-65-4	No data	No data	No data	No data
Dibenzo[a,h]fluoranthene	No CAS #	No data	No data	No data	No data
Dibenzo[a,h]pyrene	189-64-0	No data	No data	No data	No data
Dibenzo[a,i]pyrene	189-55-9	4.91E-04	Equation 2	4.90E-01	Equation 3
Fluoranthene	206-44-0	3.44E-04	Equation 2	3.04E-03	Equation 3
Hexachloronaphthalene	1335-87-1	5.15E-04	Equation 2	9.77E-01	Equation 3
Indeno[1,2,3-cd]pyrene	193-39-5	8.00E-02	EPA (1999a)	2.07E-01	Equation 3
Octachloronaphthalene	2234-13-1	4.26E-04	Equation 2	6.61E-02	Equation 3
Pentachloronaphthalene	1321-64-8	No data	No data	No data	No data
Tetrachloronaphthalene	1335-88-2	No data	No data	No data	No data
Trichloronaphthalene	1321-65-9	No data	No data	No data	No data
Light Substituted Benzene Compounds (mole wt <200 g/mole)					
1,2,3-Trichlorobenzene	87-61-6	2.91E-04	Equation 2	2.79E-04	Equation 3
1,2,4-Trichlorobenzene	120-82-1	2.88E-04	Equation 2	2.44E-04	Equation 3
1,2,4-Trimethyl benzene	95-63-6	2.73E-04	Equation 2	1.12E-04	Equation 3
1,2-Dichlorobenzene	95-50-1	2.64E-04	Equation 2	7.01E-05	Equation 3
1,3,5-Trimethyl benzene	108-67-8	2.63E-04	Equation 2	6.61E-05	Equation 3
1,3-Dichlorobenzene	541-73-1	2.68E-04	Equation 2	8.52E-05	Equation 3
1,3-Dinitrobenzene	99-65-0	1.19E+00	EPA (1999a)	7.79E-07	Equation 3
1,4-Dichlorobenzene	106-46-7	2.63E-04	Equation 2	6.48E-05	Equation 3
1,4-Dinitrobenzene	100-25-4	1.93E-04	Equation 2	7.94E-07	Equation 3
2,4,5-Trichlorophenol	95-95-4	2.83E-04	Equation 2	1.86E-04	Equation 3
2,4,6-Trichlorophenol	88-06-2	2.76E-04	Equation 2	1.29E-04	Equation 3
2,4-Dichlorophenol	120-83-2	2.47E-04	Equation 2	2.74E-05	Equation 3
2,4-Dimethylphenol	105-67-9	2.22E-04	Equation 2	5.75E-06	Equation 3
2,4-Dinitrophenol	51-28-5	1.94E-04	Equation 2	8.29E-07	Equation 3
2,4-Dinitrotoluene	121-14-2	3.08E+00	EPA (1999a)	2.49E-06	Equation 3

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	Log K_{oc} [a]	SPv (kg dry soil/kg dry tissue)	Source	SPr (kg dry soil/kg dry tissue)	Source
2,6-Dinitrotoluene	606-20-2	1.89	1.62	3.15E+00	EPA (1999a)	3.15E+00	EPA (1999a)
2-Chlorophenol	95-57-8	2.16	2.59	2.18E+00	Equation 1	2.18E+00	Equation 1
2-Chlorotoluene	95-49-8	3.42	2.65	3.50E-01	Equation 1	3.50E-01	Equation 1
2-Nitrophenol	88-75-5	1.79	1.55	3.57E+00	Equation 1	3.57E+00	Equation 1
4-Nitrophenol	100-02-7	1.91	1.64	3.05E+00	Equation 1	3.05E+00	Equation 1
Benzyl chloride	100-44-7	2.30	1.95	1.81E+00	Equation 1	1.81E+00	Equation 1
Bromobenzene	108-86-1	2.99	2.65	7.24E-01	Equation 1	7.24E-01	Equation 1
Chlorobenzene	108-90-7	2.79	2.35	9.45E-01	Equation 1	9.45E-01	Equation 1
n-Butyl benzene	104-51-8	4.28	3.40	1.30E-01	Equation 1	1.30E-01	Equation 1
Nitrobenzene	98-95-3	1.83	2.08	3.38E+00	EPA (1999a)	3.38E+00	EPA (1999a)
o-Dinitrobenzene	528-29-0	1.69	2.35	4.08E+00	Equation 1	4.08E+00	Equation 1
o-Nitroaniline	88-74-4	1.85	1.59	3.30E+00	Equation 1	3.30E+00	Equation 1
o-Toluidine	95-53-4	1.34	1.20	6.50E+00	Equation 1	6.50E+00	Equation 1
p-Chloroaniline	106-47-8	1.87	1.61	3.22E+00	Equation 1	3.22E+00	Equation 1
p-Cresol	106-44-5	1.94	1.66	2.93E+00	Equation 1	2.93E+00	Equation 1
Phenol	108-95-2	1.48	1.34	5.42E+00	Equation 1	5.42E+00	Equation 1
p-Nitrochlorobenzene	100-00-5	2.39	2.02	1.61E+00	Equation 1	1.61E+00	Equation 1
p-Toluidine	106-49-0	1.40	1.24	6.01E+00	Equation 1	6.01E+00	Equation 1
Toluene-2,6-diamine	823-40-5	0.16	2.09	3.13E+01	Equation 1	3.13E+01	Equation 1
Trimethyl benzene	25551-13-7	3.42	2.85	4.09E-01	Equation 1	4.09E-01	Equation 1
Other Light Semivolatile Compounds (molecular weight <200 g/mole)							
Benzoic acid	65-85-0	1.87	-0.26	3.21E+00	Equation 1	3.21E+00	Equation 1
Cyclohexanol	108-93-0	1.23	1.11	7.53E+00	Equation 1	7.53E+00	Equation 1
Dichloroisopropyl ether	108-60-1	2.58	1.78	1.25E+00	Equation 1	1.25E+00	Equation 1
Dichloromethyl ether	542-88-1	0.58	0.64	1.79E+01	Equation 1	1.79E+01	Equation 1
Dichloropentadiene	61626-71-9	NA	NA	No data	No data	No data	No data
N-Nitrosomorpholine	59-89-2	0.98	0.92	1.05E+01	Equation 1	1.05E+01	Equation 1

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	BAF-S (kg dry soil/ kg tissue)	Source	Mammal Ba ([mg/kg tissue] / [mg ingested /day])	Source
2,6-Dinitrotoluene	606-20-2	2.50E+00	EPA (1999a)	1.93E-06	Equation 3
2-Chlorophenol	95-57-8	2.15E-04	Equation 2	3.64E-06	Equation 3
2-Chlorotoluene	95-49-8	2.63E-04	Equation 2	8.64E-05	Equation 3
2-Nitrophenol	88-75-5	2.02E-04	Equation 2	1.55E-06	Equation 3
4-Nitrophenol	100-02-7	2.06E-04	Equation 2	2.04E-06	Equation 3
Benzyl chloride	100-44-7	2.20E-04	Equation 2	5.01E-06	Equation 3
Bromobenzene	108-86-1	2.45E-04	Equation 2	2.45E-05	Equation 3
Chlorobenzene	108-90-7	2.38E-04	Equation 2	1.55E-05	Equation 3
n-Butyl benzene	104-51-8	3.02E-04	Equation 2	4.79E-04	Equation 3
Nitrobenzene	98-95-3	2.26E+00	EPA (1999a)	1.71E-06	Equation 3
o-Dinitrobenzene	528-29-0	1.99E-04	Equation 2	1.23E-06	Equation 3
o-Nitroaniline	88-74-4	2.04E-04	Equation 2	1.78E-06	Equation 3
o-Toluidine	95-53-4	1.88E-04	Equation 2	5.50E-07	Equation 3
p-Chloroaniline	106-47-8	2.05E-04	Equation 2	1.86E-06	Equation 3
p-Cresol	106-44-5	2.07E-04	Equation 2	2.19E-06	Equation 3
Phenol	108-95-2	1.92E-04	Equation 2	7.54E-07	Equation 3
p-Nitrochlorobenzene	100-00-5	2.23E-04	Equation 2	6.17E-06	Equation 3
p-Toluidine	106-49-0	1.90E-04	Equation 2	6.31E-07	Equation 3
Toluene-2,6-diamine	823-40-5	1.55E-04	Equation 2	3.63E-08	Equation 3
Trimethyl benzene	25551-13-7	2.63E-04	Equation 2	6.61E-05	Equation 3
Other Light Semivolatile Compounds (mole wt <200 g/mole)					
Benzoic acid	65-85-0	2.05E-04	Equation 2	1.86E-06	Equation 3
Cyclohexanol	108-93-0	1.85E-04	Equation 2	4.27E-07	Equation 3
Dichloroisopropyl ether	108-60-1	2.30E-04	Equation 2	9.55E-06	Equation 3
Dichloromethyl ether	542-88-1	1.66E-04	Equation 2	9.55E-08	Equation 3
Dichloropentadiene	61626-71-9	No data	No data	No data	No data
N-Nitrosomorpholine	59-89-2	1.77E-04	Equation 2	2.40E-07	Equation 3

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	Log K_{oc} [a]	SPv (kg dry soil/kg dry tissue)	Source	SPr (kg dry soil/kg dry tissue)	Source
N-Nitroso-N,N-dimethylamine	62-75-9	-0.57	1.58	8.27E+01	Equation 1	8.27E+01	Equation 1
Quinoline	91-22-5	2.03	3.26	2.60E+00	Equation 1	2.60E+00	Equation 1
Quinone	106-51-4	0.20	0.31	2.97E+01	Equation 1	2.97E+01	Equation 1
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)							
1,2,4,5-Tetrachlorobenzene	95-94-3	4.64	3.77	8.06E-02	Equation 1	8.06E-02	Equation 1
1,3,5-Trinitrobenzene	99-35-4	1.18	1.07	8.06E+00	Equation 1	8.06E+00	Equation 1
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	4.54	3.69	9.20E-02	Equation 1	9.20E-02	Equation 1
2-sec-Butyl-4,6-dinitrophenol	88-85-7	3.56	3.55	3.39E-01	Equation 1	3.39E-01	Equation 1
3,3'-Dichlorobenzidine	91-94-1	3.58	2.94	3.30E-01	Equation 1	3.30E-01	Equation 1
3,3'-Dimethoxybenzidine	119-90-4	1.81	1.56	3.48E+00	Equation 1	3.48E+00	Equation 1
Dibutylphosphate	107-66-4	NA	NA	No data	No data	No data	No data
Dimethyl aminoazobenzene	60-11-7	4.58	3.72	8.72E-02	Equation 1	8.72E-02	Equation 1
Hexachlorobenzene	118-74-1	5.50	4.90	2.55E-02	EPA (1999a)	2.55E-02	EPA (1999a)
Hexachlorobutadiene	87-68-3	4.73	3.84	7.14E-02	EPA (1999a)	7.14E-02	EPA (1999a)
Hexachlorocyclopentadiene	77-47-4	4.91	3.98	5.65E-02	EPA (1999a)	5.65E-02	EPA (1999a)
Pentachlorobenzene	608-93-5	5.09	4.51	4.40E-02	EPA (1999a)	4.40E-02	EPA (1999a)
Pentachloronitrobenzene	82-68-8	4.64	3.77	8.00E-02	EPA (1999a)	8.00E-02	EPA (1999a)
Pentachlorophenol	87-86-5	5.08	2.70	4.49E-02	EPA (1999a)	4.49E-02	EPA (1999a)
Herbicides and Organochlorinated Pesticides							
4,4'-DDD	72-54-8	6.12	4.66	1.12E-02	Equation 1	1.12E-02	Equation 1
4,4'-DDE	72-55-9	6.26	4.94	9.37E-03	EPA (1999a)	9.37E-03	EPA (1999a)
4,4'-DDT	50-29-3	6.07	5.83	1.20E-02	Equation 1	1.20E-02	Equation 1
Aldrin	309-00-2	6.18	4.69	1.04E-02	Equation 1	1.04E-02	Equation 1
alpha-BHC	319-84-6	3.80	3.25	2.47E-01	Equation 1	2.47E-01	Equation 1
beta-BHC	319-85-7	3.83	3.33	2.36E-01	Equation 1	2.36E-01	Equation 1
Chlordane	57-74-9	5.94	4.71	1.43E-02	Equation 1	1.43E-02	Equation 1
Delta-BHC	319-86-8	4.14	2.82	1.57E-01	Equation 1	1.57E-01	Equation 1

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	BAF-S (kg dry soil/ kg tissue)	Source	Mammal Ba ([mg/kg tissue] / [mg ingested /day])	Source
N-Nitroso-N,N-dimethylamine	62-75-9	1.38E-04	Equation 2	6.76E-09	Equation 3
Quinoline	91-22-5	2.10E-04	Equation 2	2.69E-06	Equation 3
Quinone	106-51-4	1.56E-04	Equation 2	3.98E-08	Equation 3
Other Heavy Semivolatile Compounds (mole wt >200 g/mole)					
1,2,4,5-Tetrachlorobenzene	95-94-3	3.20E-04	Equation 2	1.10E-03	Equation 3
1,3,5-Trinitrobenzene	99-35-4	1.83E-04	Equation 2	3.79E-07	Equation 3
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	3.15E-04	Equation 2	8.71E-04	Equation 3
2-sec-Butyl-4,6-dinitrophenol	88-85-7	2.69E-04	Equation 2	9.12E-05	Equation 3
3,3'-Dichlorobenzidine	91-94-1	2.70E-04	Equation 2	9.44E-05	Equation 3
3,3'-Dimethoxybenzidine	119-90-4	2.03E-04	Equation 2	1.62E-06	Equation 3
Dibutylphosphate	107-66-4	No data	No data	No data	No data
Dimethyl aminoazobenzene	60-11-7	3.17E-04	Equation 2	9.55E-04	Equation 3
Hexachlorobenzene	118-74-1	2.30E+03	EPA (1999a)	7.99E-03	Equation 3
Hexachlorobutadiene	87-68-3	5.35E+02	EPA (1999a)	1.35E-03	Equation 3
Hexachlorocyclopentadiene	77-47-4	7.45E+02	EPA (1999a)	2.03E-03	EPA (1999a)
Pentachlorobenzene	608-93-5	1.05E+03	EPA (1999a)	3.08E-03	Equation 3
Pentachloronitrobenzene	82-68-8	4.51E+02	EPA (1999a)	1.10E-03	Equation 3
Pentachlorophenol	87-86-5	1.03E+03	EPA (1999a)	3.01E-03	EPA (1999a)
Herbicides and Organochlorinated Pesticides					
4,4'-DDD	72-54-8	4.06E-04	Equation 2	3.32E-02	Equation 3
4,4'-DDE	72-55-9	1.26E+00	EPA (1999a)	4.54E-02	Equation 3
4,4'-DDT	50-29-3	1.26E+00	Equation 2	2.95E-02	Equation 3
Aldrin	309-00-2	4.10E-04	Equation 2	3.79E-02	Equation 3
alpha-BHC	319-84-6	2.80E-04	Equation 2	1.58E-04	Equation 3
beta-BHC	319-85-7	2.81E-04	Equation 2	1.71E-04	Equation 3
Chlordane	57-74-9	3.95E-04	Equation 2	2.18E-02	Equation 3
Delta-BHC	319-86-8	2.95E-04	Equation 2	3.47E-04	Equation 3

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	Log K_{oc} [a]	SPv (kg dry soil/kg dry tissue)	Source	SPr (kg dry soil/kg dry tissue)	Source
Dieldrin	60-57-1	5.27	4.41	3.49E-02	Equation 1	3.49E-02	Equation 1
Endrin	72-20-8	4.89	4.03	5.76E-02	Equation 1	5.76E-02	Equation 1
gamma-BHC (Lindane)	58-89-9	3.72	3.03	2.74E-01	Equation 1	2.74E-01	Equation 1
Heptachlor	76-44-8	5.02	3.98	4.89E-02	EPA (1999a)	4.89E-02	EPA (1999a)
Methoxychlor	72-43-5	4.53	4.90	9.37E-02	Equation 1	9.37E-02	Equation 1
Toxaphene	8001-35-2	5.50	5.00	2.56E-02	Equation 1	2.56E-02	Equation 1
Inorganic Chemicals and Compounds							
Metals							
Aluminum	7429-90-5	NA	NA	4.00E-03	Baes et al. (1984)	6.50E-04	Baes et al. (1984)
Antimony	7440-36-0	NA	NA	2.00E-01	Baes et al. (1984)	3.00E-02	Baes et al. (1984)
Arsenic	7440-38-2	NA	NA	4.00E-02	Baes et al. (1984)	6.00E-03	Baes et al. (1984)
Barium	7440-39-3	NA	NA	1.50E-01	Baes et al. (1984)	1.50E-01	Baes et al. (1984)
Beryllium	7440-41-7	NA	NA	1.00E-02	Baes et al. (1984)	1.50E-03	Baes et al. (1984)
Bismuth	7440-69-9	NA	NA	3.50E-02	Baes et al. (1984)	5.00E-03	Baes et al. (1984)
Boron	7440-42-8	NA	NA	4.00E+00	Baes et al. (1984)	2.00E+00	Baes et al. (1984)
Cadmium	7440-43-9	NA	NA	5.50E-01	Baes et al. (1984)	1.50E-01	Baes et al. (1984)
Calcium	7440-70-2	NA	NA	3.50E+00	Baes et al. (1984)	3.50E-01	Baes et al. (1984)
Chromium	18540-29-9	NA	NA	7.50E-03	Baes et al. (1984)	4.50E-03	Baes et al. (1984)
Cobalt	7440-48-4	NA	NA	2.00E-02	Baes et al. (1984)	7.00E-03	Baes et al. (1984)
Copper	7440-50-8	NA	NA	4.00E-01	Baes et al. (1984)	2.50E-01	Baes et al. (1984)
Iron	7439-89-6	NA	NA	4.00E-03	Baes et al. (1984)	1.00E-03	Baes et al. (1984)
Lead	7439-92-1	NA	NA	4.50E-02	Baes et al. (1984)	9.00E-03	Baes et al. (1984)
Lithium	7439-93-2	NA	NA	2.50E-02	Baes et al. (1984)	4.00E-03	Baes et al. (1984)
Magnesium	7439-95-4	NA	NA	1.00E+00	Baes et al. (1984)	5.50E-01	Baes et al. (1984)
Manganese	7439-96-5	NA	NA	2.50E-01	Baes et al. (1984)	5.00E-02	Baes et al. (1984)

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	BAF-S (kg dry soil/ kg tissue)	Source	Mammal Ba ([mg/kg tissue] / [mg ingested /day])	Source
Dieldrin	60-57-1	3.54E-04	Equation 2	4.67E-03	Equation 3
Endrin	72-20-8	3.33E-04	Equation 2	1.96E-03	Equation 3
gamma-BHC (Lindane)	58-89-9	2.76E-04	Equation 2	1.32E-04	Equation 3
Heptachlor	76-44-8	1.40E+00	EPA (1999a)	2.60E-03	Equation 3
Methoxychlor	72-43-5	3.14E-04	Equation 2	8.44E-04	Equation 3
Toxaphene	8001-35-2	3.68E-04	Equation 2	7.94E-03	Equation 3
Inorganic Chemicals and Compounds					
Metals					
Aluminum	7429-90-5	2.20E-01	EPA (1999a)	1.50E-03	Baes et al. (1984)
Antimony	7440-36-0	2.20E-01	EPA (1999a)	1.00E-03	Baes et al. (1984)
Arsenic	7440-38-2	2.58E-01	Sample et al. 1999	2.00E-03	Baes et al. (1984)
Barium	7440-39-3	2.20E-01	EPA (1999a)	1.50E-04	Baes et al. (1984)
Beryllium	7440-41-7	2.20E-01	EPA (1999a)	1.00E-03	Baes et al. (1984)
Bismuth	7440-69-9	3.21E-01	Average[d]	4.00E-04	Baes et al. (1984)
Boron	7440-42-8	3.21E-01	Average[d]	8.00E-04	Baes et al. (1984)
Cadmium	7440-43-9	1.71E+01	Sample et al. 1999	3.40E-03	Baes et al. (1984)
Calcium	7440-70-2	3.21E-01	Average[d]	7.00E-04	Baes et al. (1984)
Chromium	18540-29-9	1.10E+00	Sample et al. 1999	5.51E-03	Baes et al. (1984)
Cobalt	7440-48-4	3.21E-01	Average[d]	2.00E-02	Baes et al. (1984)
Copper	7440-50-8	4.00E-02	EPA (1999a)	1.00E-02	Baes et al. (1984)
Iron	7439-89-6	3.21E-01	Average[d]	2.00E-02	Baes et al. (1984)
Lead	7439-92-1	3.34E+00	Sample et al. 1999	3.00E-04	Baes et al. (1984)
Lithium	7439-93-2	3.21E-01	Average[d]	1.00E-02	Baes et al. (1984)
Magnesium	7439-95-4	3.21E-01	Average[d]	5.00E-03	Baes et al. (1984)
Manganese	7439-96-5	6.40E-02	Sample et al. 1999	4.00E-04	Baes et al. (1984)

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	Log K_{oc} [a]	SPv (kg dry soil/kg dry tissue)	Source	SPr (kg dry soil/kg dry tissue)	Source
Mercury	7439-97-6	NA	NA	9.00E-01	Baes et al. (1984)	2.00E-01	Baes et al. (1984)
Mercury - Hg+2	7487-94-7	NA	NA	3.75E-02	EPA (1999a)	3.75E-02	EPA (1999a)
Methylmercury	22967-92-6	NA	NA	1.37E-01	EPA (1999a)	1.37E-01	EPA (1999a)
Molybdenum	7439-98-7	NA	NA	2.50E-01	Baes et al. (1984)	6.00E-02	Baes et al. (1984)
Nickel	7440-02-0	NA	NA	6.00E-02	Baes et al. (1984)	6.00E-02	Baes et al. (1984)
Potassium	7440-09-7	NA	NA	1.00E+00	Baes et al. (1984)	5.50E-01	Baes et al. (1984)
Selenium	7782-49-2	NA	NA	2.50E-02	Baes et al. (1984)	2.50E-02	Baes et al. (1984)
Silicon	7440-21-3	NA	NA	3.50E-01	Baes et al. (1984)	7.00E-02	Baes et al. (1984)
Silver	7440-22-4	NA	NA	4.00E-01	Baes et al. (1984)	1.00E-01	Baes et al. (1984)
Sodium	7440-23-5	NA	NA	7.50E-02	Baes et al. (1984)	5.50E-02	Baes et al. (1984)
Strontium	7440-24-6	NA	NA	2.50E+00	Baes et al. (1984)	2.50E-01	Baes et al. (1984)
Thallium	7440-28-0	NA	NA	4.00E-03	Baes et al. (1984)	4.00E-04	Baes et al. (1984)
Vanadium	7440-62-2	NA	NA	5.50E-03	Baes et al. (1984)	3.00E-03	Baes et al. (1984)
Yttrium	7440-65-5	NA	NA	1.50E-02	Baes et al. (1984)	6.00E-03	Baes et al. (1984)
Zinc	7440-66-6	NA	NA	1.50E+00	Baes et al. (1984)	9.00E-01	Baes et al. (1984)

Appendix Table R-34. Ecological Transfer Factors for COPECs for Load Line 4 Baseline Risk Assessment

Constituent of Potential Concern	CAS Registry Number	BAF-S (kg dry soil/ kg tissue)	Source	Mammal Ba ([mg/kg tissue] / [mg ingested /day])	Source
Mercury	7439-97-6	5.23E+00	Sample et al. 1999	5.21E-03	EPA (1999a)
Mercury - Hg+2	7487-94-7	4.00E-02	EPA (1999a)	5.21E-03	EPA (1999a)
Methylmercury	22967-92-6	8.50E+00	EPA (1999a)	7.81E-04	EPA (1999a)
Molybdenum	7439-98-7	3.21E-01	Average[d]	6.00E-03	Baes et al. (1984)
Nickel	7440-02-0	1.66E+00	Sample et al. 1999	6.00E-03	Baes et al. (1984)
Potassium	7440-09-7	3.21E-01	Average[d]	2.00E-02	Baes et al. (1984)
Selenium	7782-49-2	2.20E-01	EPA (1999a)	1.90E-03	Baes et al. (1984)
Silicon	7440-21-3	3.21E-01	Average[d]	4.00E-05	Baes et al. (1984)
Silver	7440-22-4	2.20E-01	EPA (1999a)	3.00E-03	Baes et al. (1984)
Sodium	7440-23-5	3.21E-01	Average[d]	5.50E-02	Baes et al. (1984)
Strontium	7440-24-6	3.21E-01	Average[d]	3.00E-04	Baes et al. (1984)
Thallium	7440-28-0	2.20E-01	EPA (1999a)	4.00E-02	Baes et al. (1984)
Vanadium	7440-62-2	3.21E-01	Average[d]	2.50E-03	Baes et al. (1984)
Yttrium	7440-65-5	3.21E-01	Average[d]	3.00E-04	Baes et al. (1984)
Zinc	7440-66-6	5.77E+00	Sample et al. 1999	1.00E-01	Baes et al. (1984)

Appendix Table R-35. Uptake Factors for Load Line 4 Sediment and Surface Water, Ravenna, Ohio

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	log(K_{ow})	BSAF (kg sediment/ kg tissue)		WP (L/kg plant tissue)		BCF (L/kg aquatic biota tissue)		FCM[a]
			Value	Source	Value	Source	Value	Source	
Metals									
Antimony	7440-36-0	none	9.0E-01	EPA (1999)	NA	NA	NA	NA	1.0E+00
Beryllium	7440-41-7	none	9.0E-01	EPA (1999)	NA	NA	NA	NA	1.0E+00
Cadmium	7440-43-9	none	3.4E+00	EPA (1999)	7.8E+02	EPA (1999)	9.1E+02	EPA (1999)	1.0E+00
Calcium	7440-70-2	none			No Value	No Value			
Copper	7440-50-8	none	3.0E-01	EPA (1999)	NA	NA	NA	NA	1.0E+00
Iron	7439-89-6	none	No Value	No Value	No Value	No Value	No Value	No Value	1.0E+00
Lead	7439-92-1	none	6.3E-01	EPA (1999)	NA	NA	NA	NA	1.0E+00
Magnesium	7439-95-4	none	No Value	No Value	No Value	No Value	No Value	No Value	1.0E+00
Manganese	7439-96-5	none	No Value	No Value	No Value	No Value	No Value	No Value	1.0E+00
Mercury	7487-94-7	none	6.8E-02	EPA (1999)	2.5E+04	EPA (1999)	3.5E+03	EPA (1999)	1.0E+00
Nickel	7440-02-0	none	9.0E-01	EPA (1999)	NA	NA	NA	NA	1.0E+00
Potassium		none	9.0E-01	EPA (1999)	No Value	NA	NA	NA	1.0E+00
Silver	7440-21-3	none	1.07E+04	EPA (1999)	NA	NA	NA	NA	1.0E+00
Zinc	7440-66-6	none	5.7E-01	EPA (1999)	2.2E+03	NA	NA	NA	1.0E+00
Organics-Semivolatile									
Benzo(a)anthracene	56-55-3	5.7E+00	1.5E+00	EPA (1999)	NA	NA	NA	NA	1.0E+01
Benzo(a)pyrene	50-32-8	6.1E+00	1.6E+00	EPA (1999)	NA	NA	NA	NA	1.8E+01
Benzo(b)fluoranthene	205-99-2	6.2E+00	1.6E+00	EPA (1999)	NA	NA	NA	NA	2.0E+01
Benzo(g,h,i)perylene	191-24-2	7.1E+00	4.8E-04	Equation 1	NA	NA	NA	NA	2.5E+01
Benzo(k)fluoranthene	207-08-9	6.2E+00	1.6E+00	EPA (1999)	NA	NA	NA	NA	2.0E+01
Bis(2-ethylhexyl)phthalate	117-81-7	5.2E+00	1.3E+03	EPA (1999)	9.93E+03	EPA (1999)	7.0E+01	EPA (1999)	3.9E+00
Chrysene	218-01-9	5.7E+00	1.4E+00	EPA (1999)	NA	NA	NA	NA	1.0E+01
Dibenzo(a,h)anthracene	53-70-3	6.5E+00	1.6E+00	EPA (1999)	NA	NA	NA	NA	2.5E+01
Fluoranthene	206-44-0	5.1E+00	3.4E-04	Equation 1	NA	NA	NA	NA	3.2E+00
Indeno(1,2,3-cd)pyrene	193-39-5	6.9E+00	1.6E+00	EPA (1999)	NA	NA	NA	NA	2.7E+02
Phenanthrene	85-01-8	4.6E+00	3.2E-04	Equation 1	NA	NA	NA	NA	1.5E+00
Pyrene	129-00-0	5.0E+00	3.4E-04	Equation 1	NA	NA	NA	NA	2.6E+00

Appendix Table R-35. Uptake Factors for Load Line 4 Sediment and Surface Water, Ravenna, Ohio

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	log(K_{ow})	BSAF (kg sediment/ kg tissue)		WP (L/kg plant tissue)		BCF (L/kg aquatic biota tissue)		FCM[a]
			Value	Source	Value	Source	Value	Source	
Pesticides/PCBs									
4,4'-DDE	72-55-9	6.3E+00	9.5E-01	EPA (1999)	NA	NA	NA	NA	2.2E+01
4,4'-DDT	50-29-3	6.1E+00	4.0E-04	Equation 1	1.13E+04	EPA (1999)	1.71E+04	Equation 2c	1.8E+01
Endrin	72-20-8	4.9E+00	3.3E-04	Equation 1	NA	NA	NA	NA	2.2E+00
gamma-Chlordane	57-74-9	5.9E+00	3.9E-04	Equation 1	NA	NA	NA	NA	1.4E+01
Aroclor 1248	12672-29-6	6.3E+00	4.2E-04	Equation 1	NA	NA	NA	NA	2.2E+01
Aroclor-1254	1336-36-3	6.3E+00	1.1E+00	EPA (1999)	NA	NA	NA	NA	2.2E+01
Explosives									
2,4,6-Trinitrotoluene	118-96-7	1.6E+00	2.0E-04	Equation 1	NA	NA	NA	NA	1.0E+00
4-Amino-2,6-dinitrotoluene	19406-51-0	1.8E+00	2.0E-04	Equation 1	NA	NA	NA	NA	1.0E+00

COPEC = Constituents of potential ecological concern
ESV = ecological screening value
log(K_{ow}) = logarithm of octanol/water partitioning coefficient
BSAF = sediment to sediment biota uptake factor
WP = water to aquatic plant uptake factor
BCF = water to aquatic animal uptake factor
FCM = food chain multiplier
NA = Not applicable because analyte is not a COPEC in this medium.

[a] Tabulated in EPA 1999

[b] Equation 1: log(BSAF) = 1.588 - [0.578 x log(Kow)]

[c] Equation 4: log BCF = 0.91 × log K_{ow} - 1.975 × log(6.8E-07 × K_{ow} + 1.0) - 0.786 (Bintein et al. 1993) as referenced in EPA (1999a).

Appendix Table R-36. Area Use Factors (AUFs) for Terrestrial Receptors at Load Line 4

Receptor	HR ha	AUF Explosive Handling Area Aggregate Area ha = 4.16 (10.3 ac)	AUF Preparation & Receiving Area Aggregate Area ha = 2.27 (5.6 ac)	AUF Packaging & Shipping Area Aggregate Area ha = 0.74 (1.8 ac)	AUF Perimeter Area Aggregate Area ha = 45.57 (112.6 ac)	AUF Melt-Pour Drainage Ditches Aggregate Area ha = 0.58 (1.4 ac)
Red fox	5.04E+02	8.25E-03	4.50E-03	1.48E-03	9.04E-02	1.15E-03
Red-tailed hawk	8.76E+02	4.75E-03	2.59E-03	8.50E-04	5.20E-02	6.64E-04
Eastern Cottontail	3.10E+00	1.00E+00	7.32E-01	2.40E-01	1.00E+00	1.88E-01

AUF = Fraction of receptor exposure from the unit = area of unit/ area of HR; AUF = 1 when area of unit exceeds area of HR

HR = Home range

ha = hectares

Appendix Table R-37. Load Line 4 Area Use Factors (AUFs) for Sediment and Aquatic Receptors at Ravenna, Ohio

Receptor	HR ha	AUF Main Stream Segment Upstream of Perimeter Road Aggregate Area ha = 0.12 (0.3 ac)	AUF Main Stream Segment and Settling Pond Aggregate Area ha = 1.5 (3.7 ac)	AUF Exit Drainage Aggregate Area ha = 0.44 (1.1 ac)
Muskrat	1.30E-01	9.23E-01	1.00E+00	1.00E+00
Mallard duck	4.35E+02	2.76E-04	3.45E-03	1.01E-03
Mink	4.70E+02	2.55E-04	3.19E-03	9.36E-04
Great blue heron	6.00E-01	2.00E-01	1.00E+00	7.33E-01

AUF = Fraction of receptor exposure from the unit = area of unit/ area of HR; AUF = 1 when area of unit exceeds area of HR

HR = Home range

ha = hectares

ac = acres

Appendix Table R-38. Ingestion rates of animal, plant, and soil for wildlife receptors at Load Line 4

Receptor	IR_F (kg/kg/d)	I_P (kg/kg/d)	I_A (kg/kg/d)	I_S (kg/kg/d)	IR_W (kg/kg/d)
Terrestrial					
Cottontail rabbit	2.00E-01	1.88E-01	0.00E+00	1.26E-02	9.70E-02
Short-tailed shrew	5.60E-01	7.28E-02	4.87E-01	3.36E-02	2.23E-01
Red Fox	9.50E-02	4.37E-03	9.06E-02	2.66E-03	8.50E-02
Red-tailed hawk	1.10E-01	0.00E+00	1.10E-01	0.00E+00	5.70E-02
Aquatic					
Muskrat	3.00E-01	3.00E-01	0.00E+00	0.00E+00	9.80E-01
Mink	1.60E-01	0.00E+00	1.60E-01	0.00E+00	7.90E-02
Mallard duck	6.30E-02	6.17E-02	0.00E+00	1.89E-03	5.70E-02
Great blue heron	1.80E-01	0.00E+00	1.80E-01	0.00E+00	4.50E-02

IR_F = ingestion rate of food (kg/kg body wt/d)

I_P = ingestion rate of plant material (kg/kg body wt/d)

I_A = ingestion rate of plant material (kg/kg body wt/d)

I_S = ingestion rate of plant material (kg/kg body wt/d)

IR_W = ingestion rate of water (kg/kg body wt/d)

Appendix Table R-39. Toxicity Reference Values (TRVs) for Plants Exposed to Soil (1997) at Load Line 4, Ravenna, Ohio

Ecological constituent of potential concern	Plant TRV (mg/kg)	Type of Media	Reference
Inorganics			
Aluminum	5.00E+01	Soil	Efroymson et al. (1997a)
Antimony	5.00E+00	Soil	Efroymson et al. (1997a)
Arsenic	1.00E+01	Soil	Efroymson et al. (1997a)
Barium	5.00E+02	Soil	Efroymson et al. (1997a)
Beryllium	1.00E+01	Soil	Efroymson et al. (1997a)
Bismuth	2.00E+01	Soil Solution	Efroymson et al. (1997a)
Boron	5.00E-01	Soil	Efroymson et al. (1997a)
Bromine	1.00E+01	Soil	Efroymson et al. (1997a)
Cadmium	4.00E+00	Soil	Efroymson et al. (1997a)
Chromium	1.00E+00	Soil	Efroymson et al. (1997a)
Cobalt	2.00E+01	Soil	Efroymson et al. (1997a)
Copper	1.00E+02	Soil	Efroymson et al. (1997a)
Fluorine	2.00E+02	Soil	Efroymson et al. (1997a)
Iodine	4.00E+00	Soil	Efroymson et al. (1997a)
Iron	1.00E+01	Soil Solution	Efroymson et al. (1997a)
Lead	5.00E+01	Soil	Efroymson et al. (1997a)
Lithium	2.00E+00	Soil	Efroymson et al. (1997a)
Magnesium	No TRV	None	None
Manganese	5.00E+02	Soil	Efroymson et al. (1997a)
Mercury	3.00E-01	Soil	Efroymson et al. (1997a)
Methyl mercury	2.00E-04	Soil Solution	Efroymson et al. (1997a)
Molybdenum	2.00E+00	Soil	Efroymson et al. (1997a)
Nickel	3.00E+01	Soil	Efroymson et al. (1997a)
Selenium	1.00E+00	Soil	Efroymson et al. (1997a)
Silver	2.00E+00	Soil	Efroymson et al. (1997a)
Sodium	No TRV	None	None
Technetium	2.00E-01	Soil	Efroymson et al. (1997a)
Tellurium	2.00E+00	Soil Solution	Efroymson et al. (1997a)
Thallium	1.00E+00	Soil	Efroymson et al. (1997a)
Tin	5.00E+01	Soil	Efroymson et al. (1997a)
Titanium	6.00E-02	Soil Solution	Efroymson et al. (1997a)
Uranium	5.00E+00	Soil	Efroymson et al. (1997a)
Vanadium	2.00E+00	Soil	Efroymson et al. (1997a)
Zinc	5.00E+01	Soil	Efroymson et al. (1997a)
Organics			
2,4,6-Trinitrotoluene	No TRV	None	None
Acenaphthene	2.00E+01	Soil	Efroymson et al. (1997a)
Aroclor-1254	4.00E+01	Soil	Efroymson et al. (1997a)
Aniline	2.00E+02	Soil Solution	Efroymson et al. (1997a)
Anthracene	No TRV	None	None
Benzo(a)anthracene	No TRV	None	None
Benzo(a)pyrene	No TRV	None	None
Benzo(b)fluoranthene	No TRV	None	None
Benzo(g,h,i)perylene	No TRV	None	None
Benzoic acid	No TRV	None	None
Benzo(k)fluoranthene	No TRV	None	None
Biphenyl	6.00E+01	Soil	Efroymson et al. (1997a)
4-Bromoaniline	1.00E+02	Soil Solution	Efroymson et al. (1997a)
3-Chloroaniline	2.00E+01	Soil	Efroymson et al. (1997a)
4-Chloroaniline	4.00E+01	Soil Solution	Efroymson et al. (1997a)
2-Chlorophenol	6.00E+01	Soil Solution	Efroymson et al. (1997a)
3-Chlorophenol	7.00E+00	Soil	Efroymson et al. (1997a)

Appendix Table R-39. Toxicity Reference Values (TRVs) for Plants Exposed to Soil (1997) at Load Line 4, Ravenna, Ohio

Ecological constituent of potential concern	Plant TRV (mg/kg)	Type of Media	Reference
4-Chlorophenol	5.00E+01	Soil Solution	Efroymson et al. (1997a)
2-Cresol	5.00E+01	Soil Solution	Efroymson et al. (1997a)
Chrysene	No TRV	None	None
4,4'-DDT	No TRV	None	None
3,4-dichloroaniline	1.00E+01	Soil Solution	Efroymson et al. (1997a)
2,4-Dichlorophenol	2.00E+01	Soil Solution	Efroymson et al. (1997a)
3,4-Dichlorophenol	2.00E+01	Soil	Efroymson et al. (1997a)
Dieldrin	No TRV	None	None
2,4-Dinitrophenol	2.00E+01	Soil	Efroymson et al. (1997a)
Dibenzofuran	No TRV	None	None
Dimethylphthalate	No TRV	None	None
Di-n-butyl phthalate	2.00E+02	Soil	Efroymson et al. (1997a)
Diethylphthalate	1.00E+02	Soil	Efroymson et al. (1997a)
Fluoranthene	No TRV	None	None
Fluorene	No TRV	None	None
Furan	6.00E+02	Soil	Efroymson et al. (1997a)
Heptane	1.00E+00	Soil Solution	Efroymson et al. (1997a)
Hexachlorocyclopentadiene	1.00E+01	Soil	Efroymson et al. (1997a)
Indeno(1,2,3-cd)pyrene	No TRV	None	None
Naphthalene	1.00E+01	Soil Solution	Efroymson et al. (1997a)
3-Nitroaniline	7.00E+01	Soil Solution	Efroymson et al. (1997a)
4-Nitroaniline	4.00E+01	Soil Solution	Efroymson et al. (1997a)
Nitrobenzene	8.00E+00	Soil Solution	Efroymson et al. (1997a)
4-Nitrophenol	1.00E+01	Soil Solution	Efroymson et al. (1997a)
Pentachlorophenol	3.00E+00	Soil	Efroymson et al. (1997a)
Phenanthrene	No TRV	None	None
Phenol	7.00E+01	Soil	Efroymson et al. (1997a)
Pyrene	No TRV	None	None
PCBs	3.00E+02	Soil	Efroymson et al. (1997a)
Styrene	3.00E+02	Soil	Efroymson et al. (1997a)
2,3,5,6-Tetrachloroaniline	2.00E+01	Soil	Efroymson et al. (1997a)
tetrachloroethene	1.00E+01	Soil Solution	Efroymson et al. (1997a)
Toluene	2.00E+02	Soil	Efroymson et al. (1997a)
4-Toluidine	1.00E+02	Soil Solution	Efroymson et al. (1997a)
2,4,5-Trichloroaniline	2.00E+01	Soil	Efroymson et al. (1997a)
Trichloroethene	1.00E+02	Soil Solution	Efroymson et al. (1997a)
2,4,5-Trichlorophenol	4.00E+00	Soil	Efroymson et al. (1997a)
2,4,5-Trichlorophenol	1.00E+01	Soil Solution	Efroymson et al. (1997a)
Ortho-xylene	1.00E+00	Soil Solution	Efroymson et al. (1997a)
Xylene	1.00E+02	Soil Solution	Efroymson et al. (1997a)

Appendix Table R-40. Toxicity Reference Values (TRVs) for Earthworms Exposed to Soil at Load Line 4, Ravenna, Ohio

Ecological constituent of potential concern	Earthworm TRV[a] (mg/kg)	Reference
Inorganics		
Aluminum	No TRV	None
Antimony	No TRV	None
Arsenic	6.00E+01	Efroymson et al. (1997b)
Barium	No TRV	None
Beryllium	No TRV	None
Cadmium	2.00E+01	Efroymson et al. (1997b)
Calcium	No TRV	None
Chromium	4.00E-01	Efroymson et al. (1997b)
Chromium VI	No TRV	None
Cobalt	No TRV	None
Copper	6.00E+01	Efroymson et al. (1997b)
Cyanide	No TRV	None
Iron	No TRV	None
Lead	5.00E+02	Efroymson et al. (1997b)
Magnesium	No TRV	None
Manganese	No TRV	None
Mercury	1.00E-01	Efroymson et al. (1997b)
Nickel	2.00E+02	Efroymson et al. (1997b)
Potassium	No TRV	None
Selenium	7.00E+01	Efroymson et al. (1997b)
Silver	No TRV	None
Sodium	No TRV	None
Thallium	No TRV	None
Vanadium	No TRV	None
Zinc	2.00E+02	Efroymson et al. (1997b)
Organics		
2,2,5-Trimethylhexane	No TRV	None
Acenaphthene	No TRV	None
Acenaphthylene	No TRV	None
Acetone	No TRV	None
Aldrin	No TRV	None
alpha-Chlordane	No TRV	None
Anthracene	No TRV	None
Aroclor-1254	No TRV	None
Aroclor-1260	No TRV	None
Benzo(a)anthracene	No TRV	None
Benzo(a)pyrene	No TRV	None
Benzo(b)fluoranthene	No TRV	None
Benzo(g,h,i)perylene	No TRV	None
Benzo(k)fluoranthene	No TRV	None
Benzoic Acid	No TRV	None
Bis(2-ethylhexyl)phthalate	No TRV	None

Appendix Table R-40. Toxicity Reference Values (TRVs) for Earthworms Exposed to Soil at Load Line 4, Ravenna, Ohio

Ecological constituent of potential concern	Earthworm TRV[a] (mg/kg)	Reference
Butylbenzylphthalate	No TRV	None
Carbazole	No TRV	None
Chrysene	No TRV	None
delta-BHC	No TRV	None
1,2-Dichlorobenzene	No TRV	None
1,2-Dichloroethene	No TRV	None
1,3-Dichlorobenzene	No TRV	None
1,4-Dichlorobenzene	2.00E+01	Efroymson et al. (1997b)
2,4-Dimethylphenol	No TRV	None
4,4'-DDD	No TRV	None
4,4'-DDE	No TRV	None
4,4'-DDT	No TRV	None
Dibenzo(a,h)anthracene	No TRV	None
Dibenzofuran	No TRV	None
Diethylphthalate	No TRV	None
Dieldrin	No TRV	None
Di-n-butylphthalate	No TRV	None
Endosulfan	No TRV	None
Endosulfan sulfate	No TRV	None
Endrin aldehyde	No TRV	None
Endrin ketone	No TRV	None
Fluoranthene	No TRV	None
Fluorene	No TRV	None
gamma-BHC (Lindane)	No TRV	None
gamma-Chlordane	No TRV	None
Heptachlor epoxide	No TRV	None
Indeno(1,2,3-cd)pyrene	No TRV	None
2-Methylnaphthalene	No TRV	None
2-Methylphenol	No TRV	None
4-Methylphenol	No TRV	None
Methoxychlor	No TRV	None
Methylene chloride	No TRV	None
Naphthalene	No TRV	None
Pentachlorophenol	6.00E+00	Efroymson et al. (1997b)
Phenanthrene	No TRV	None
Phenol	3.00E+01	Efroymson et al. (1997b)
Pyrene	No TRV	None
Toluene	No TRV	None
Trichloroethene	No TRV	None
1,2,4-Trichlorobenzene	2.00E+01	Efroymson et al. (1997b)
2,4,5-Trichlorophenol	9.00E+00	Efroymson et al. (1997b)
Dioxins and Furans		
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	No TRV	None

Appendix Table R-40. Toxicity Reference Values (TRVs) for Earthworms Exposed to Soil at Load Line 4, Ravenna, Ohio

Ecological constituent of potential concern	Earthworm TRV[a] (mg/kg)	Reference
1,2,3,4,6,7,8-Heptachlorodibenzofuran	No TRV	None
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	No TRV	None
1,2,3,4,7,8-Hexachlorodibenzofuran	No TRV	None
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	No TRV	None
Octachlorodibenzo-p-dioxin	1.00E-03	TEF
Octachlorodibenzofuran	1.00E-03	TEF

[a] Lowest Observed Adverse Effect Level
TEF = Toxicity Equivalence Factor
TRV = Toxicity Reference Values

Appendix Table R-41. Derivation of No Observed Adverse Effect Level (NOAEL) Toxicity Reference Values (TRVs) for Mammal Test Species

Ecological constituent of potential concern	Test species	Test species body weight (kg) BW_t	Benchmark (mg/kgBW/d)	Test duration	Endpoint	Effect	Source	Duration conversion factor DCF	Endpoint conversion factor ECF	TRV (mg/kgBW/d) benchmark *x* DCF *x* ECF
Inorganics										
Aluminum	Mouse	3.00E-02	1.93E+01	chronic	LOAEL	Reproduction	Ondreicka et al. (1966) in [1]	1.0	0.1	1.93E+00
Ammonia	none	none	none	none	none	none	none	none	none	No TRV
Antimony	Mouse	3.00E-02	1.25E+00	chronic	LOAEL	Longevity	Schroeder et al. (1968b) in [1]	1.0	0.1	1.25E-01
Arsenic	Mouse	3.00E-02	1.26E+00	chronic	LOAEL	Reproduction	Schroeder and Mitchner (1971) in [1]	1.0	0.1	1.26E-01
Arsenic (dissolved)	Mouse	3.00E-02	1.26E+00	chronic	LOAEL	Reproduction	Schroeder and Mitchner (1971) in [1]	1.0	0.1	1.26E-01
Barium	Rat	4.35E-01	5.06E+00	chronic	NOAEL	Growth	Perry et al. (1983) in [1]	1.0	1.0	5.06E+00
Barium (dissolved)	Rat	4.35E-01	5.06E+00	chronic	NOAEL	Growth	Perry et al. (1983) in [1]	1.0	1.0	5.06E+00
Beryllium	Rat	3.50E-01	6.60E-01	chronic	NOAEL	Longevity	Schroeder and Mitchner (1975) in [1]	1.0	1.0	6.60E-01
Beryllium (dissolved)	Rat	3.50E-01	6.60E-01	chronic	NOAEL	Longevity	Schroeder and Mitchner (1975) in [1]	1.0	1.0	6.60E-01
Boron	Rat	3.50E-01	2.80E+01	chronic	NOAEL	Reproduction	Weir and Fisher (1972) in [1]	1.0	1.0	2.80E+01
Cadmium	Rat	3.03E-01	1.00E+00	chronic	NOAEL	Reproduction	Sutou et al. (1980b) in [1]	1.0	1.0	1.00E+00
Cadmium (dissolved)	Rat	3.03E-01	1.00E+00	chronic	NOAEL	Reproduction	Sutou et al. (1980b) in [1]	1.0	1.0	1.00E+00
Calcium	none	none	none	none	none	none	none	none	none	No TRV
Chloride	none	none	none	none	none	none	none	none	none	No TRV
Chromium	Rat	3.50E-01	2.74E+03	chronic	NOAEL	Reproduction	Ivankovic and Preussmann (1975) in [	1.0	1.0	2.74E+03
Chromium, hexavalent	none	none	none	none	none	none	none	none	none	No TRV
Cobalt	Rat	none	1.00E+00	subchronic	NOAEL	Mortality	Underhill et al. (1931) in [2]	0.1	1.0	1.00E-01
Copper	Mink	1.00E+00	1.17E+01	chronic	NOAEL	Reproduction	Aulerich et al. (1982) in [1]	1.0	1.0	1.17E+01
Copper (dissolved)	Mink	1.00E+00	1.17E+01	chronic	NOAEL	Reproduction	Aulerich et al. (1982) in [1]	1.0	1.0	1.17E+01
Cyanide	Rat	2.73E-01	6.87E+01	chronic	NOAEL	Reproduction	Tewe and Maner (1981) in [1]	1.0	1.0	6.87E+01
Fluoride	Mink	1.00E+00	3.14E+01	chronic	NOAEL	Reproduction	Bleavinss et Aulerich (1981) in [1]	1.0	1.0	3.14E+01
Iron	none	none	none	none	none	none	none	none	none	No TRV
Lead	Rat	3.50E-01	8.00E+00	chronic	NOAEL	Reproduction	Azar et al. (1973) in [1]	1.0	1.0	8.00E+00
Lead (dissolved)	Rat	3.50E-01	8.00E+00	chronic	NOAEL	Reproduction	Azar et al. (1973) in [1]	1.0	1.0	8.00E+00
Magnesium	none	none	none	none	none	none	none	none	none	No TRV
Manganese	Rat	3.50E-01	8.80E+01	chronic	NOAEL	Reproduction	Laskey et al. (1982) in [1]	1.0	1.0	8.80E+01
Mercury	Mink	1.00E+00	1.01E+00	chronic	NOAEL	Reproduction	Aulerich et al. (1974) in [1]	1.0	1.0	1.01E+00
Molybdenum	Mouse	3.00E-02	2.58E+00	chronic	LOAEL	Reproduction	Schroeder and Mitchner (1971) in [1]	1.0	0.1	2.58E-01
Nickel	Rat	3.50E-01	4.00E+01	chronic	NOAEL	Reproduction	Ambrose et al. (1976) in [1]	1.0	1.0	4.00E+01
Nickel (dissolved)	Rat	3.50E-01	4.00E+01	chronic	NOAEL	Reproduction	Ambrose et al. (1976) in [1]	1.0	1.0	4.00E+01
Nitrate	none	none	none	none	none	none	none	none	none	No TRV
Phosphorus	none	none	none	none	none	none	none	none	none	No TRV
Potassium	none	none	none	none	none	none	none	none	none	No TRV
Selenium	Rat	3.50E-01	2.00E-01	chronic	NOAEL	Reproduction	Rosenfeld and Beath (1954) in [1]	1.0	1.0	2.00E-01
Silver	none	none	none	none	none	none	none	none	none	No TRV
Silicon	none	none	none	none	none	none	none	none	none	No TRV
Sodium	none	none	none	none	none	none	none	none	none	No TRV
Sulfate	none	none	none	none	none	none	none	none	none	No TRV
Thallium	Rat	3.65E-01	7.40E-01	subchronic	LOAEL	Reproduction	Formigli et al. (1986) in [1]	0.1	0.1	7.40E-03
Vanadium	Rat	2.60E-01	2.10E+00	chronic	LOAEL	Reproduction	Domingo et al. (1986) in [1]	1.0	0.1	2.10E-01
Zinc	Rat	3.50E-01	1.60E+02	chronic	NOAEL	Reproduction	Schlicker and Cox (1968) in [1]	1.0	1.0	1.60E+02

Appendix Table R-41. Derivation of No Observed Adverse Effect Level (NOAEL) Toxicity Reference Values (TRVs) for Mammal Test Species

Ecological constituent of potential concern	Test species	Test species body weight (kg) BW_t	Benchmark (mg/kgBW/d)	Test duration	Endpoint	Effect	Source	Duration conversion factor DCF	Endpoint conversion factor ECF	TRV (mg/kgBW/d) benchmark *x* DCF *x* ECF
Organics										
1,1,1-Trichloroethane	Mouse	3.50E-02	1.00E+03	chronic	NOAEL	Reproduction	Lane et al. (1982) in [1]	1.0	1.0	1.00E+03
1,1,2,2-Tetrachloroethane	none	none	none	none	none	none	none	none	none	No TRV
1,1,2-Trichloroethane	none	none	none	none	none	none	none	none	none	No TRV
1,1-Dichloroethane	none	none	none	none	none	none	none	none	none	No TRV
1,1-Dichloroethene	Rat	3.50E-01	3.00E+01	chronic	NOAEL	Mortality	Quast et al. (1983) in [1]	1.0	1.0	3.00E+01
1,1-Dichloroethene	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,4,6,7,8-HpCDF	none	none	none	none	none	none	none	none	none	No TRV
1,2,4-trichlorobenzene	none	none	none	none	none	none	none	none	none	No TRV
1,2-cis-Dichloroethene	Mouse	3.00E-02	4.52E+01	subchronic	NOAEL	Hepatotoxicity	Palmer et al. (1979) in [1]	0.1	1.0	4.52E+00
1,2-Dichlorobenzene	none	none	none	none	none	none	none	none	none	No TRV
1,2-Dichlorobenzene	none	none	none	none	none	none	none	none	none	No TRV
1,2-Dichloroethane	Mouse	3.50E-02	5.00E+01	chronic	NOAEL	Reproduction	Lane et al. (1982) in [1]	1.0	1.0	5.00E+01
1,2-Dichloroethane	Mouse	3.50E-02	5.00E+01	chronic	NOAEL	Reproduction	Lane et al. (1982) in [1]	1.0	1.0	5.00E+01
1,2-Dichloroethene	Mouse	3.00E-02	4.52E+02	subchronic	NOAEL	Blood chemistry	Palmer et al. (1979) in [1]	0.1	1.0	4.52E+01
1,2-Dichloroethene	Mouse	3.00E-02	4.52E+01	subchronic	NOAEL	Hepatotoxicity	Palmer et al. (1979) in [1]	0.1	1.0	4.52E+00
1,2-Dichloropropane	none	none	none	none	none	none	none	none	none	No TRV
1,2-trans-Dichloroethene	Mouse	3.00E-02	4.52E+01	subchronic	NOAEL	Hepatotoxicity	Palmer et al. (1979) in [1]	0.1	1.0	4.52E+00
1,3-Dichlorobenzene	none	none	none	none	none	none	none	none	none	No TRV
1,4-Dichlorobenzene	none	none	none	none	none	none	none	none	none	No TRV
2,2,5-Trimethylhexane	none	none	none	none	none	none	none	none	none	No TRV
2,4,5-trichlorophenol	none	none	none	none	none	none	none	none	none	No TRV
2,4-D	none	none	none	none	none	none	none	none	none	No TRV
2,4-Dimethylphenol	none	none	none	none	none	none	none	none	none	No TRV
2-Chlorophenol	none	none	none	none	none	none	none	none	none	No TRV
2-Hexanone	none	none	none	none	none	none	none	none	none	No TRV
2-Methylnaphthalene	none	none	none	none	none	none	none	none	none	No TRV
2-Methylnaphthalene	none	none	none	none	none	none	none	none	none	No TRV
2-Methylphenol	none	none	none	none	none	none	none	none	none	No TRV
4,4'-DDD	none	none	none	none	none	none	none	none	none	No TRV
4,4'-DDE	none	none	none	none	none	none	none	none	none	No TRV
4,4'-DDT	Rat	3.50E-01	8.00E-01	chronic	NOAEL	Reproduction	Fitzhugh (1948) in [1]	1.0	1.0	8.00E-01
4-Chloro-3-methylphenol	none	none	none	none	none	none	none	none	none	No TRV
4-Methyl-2-pentanone	Rat	3.50E-01	2.50E+02	subchronic	NOAEL	Liver/Kidney	Microbiological Associates (1986) in [	0.1	1.0	2.50E+01
4-Methylphenol	none	none	none	none	none	none	none	none	none	No TRV
4-Methylphenol	none	none	none	none	none	none	none	none	none	No TRV
4-Nitrophenol	none	none	none	none	none	none	none	none	none	No TRV
Acenaphthene	none	none	none	none	none	none	none	none	none	No TRV
Acenaphthylene	none	none	none	none	none	none	none	none	none	No TRV
Acetone	Rat	3.50E-01	1.00E+02	subchronic	NOAEL	Reproduction	EPA (1986c) in [1]	0.1	1.0	1.00E+01
Aldrin	Rat	3.50E-01	2.00E-01	chronic	NOAEL	Reproduction	EPA (1988a) in [1]	1.0	1.0	2.00E-01
Alkalinity	none	none	none	none	none	none	none	none	none	No TRV
alpha-Chlordane	Mouse	3.00E-02	4.58E+00	chronic	NOAEL	Reproduction	Keplinger et al. (1968) in [1]	1.0	1.0	4.58E+00
Anthracene	none	none	none	none	none	none	none	none	none	No TRV
Aroclor-1242	Mink	1.00E+00	6.85E-01	chronic	LOAEL	Reproduction	Bleavins et al. (1980) in [1]	1.0	0.1	6.85E-02
Aroclor-1248	Rhesus monkey	5.00E+00	1.00E-01	chronic	LOAEL	Reproduction	Barsotti et al. (1976) in [1]	1.0	0.1	1.00E-02
Aroclor-1254	Oldfield mouse	1.40E-02	6.80E-01	chronic	LOAEL	Reproduction	McCoy et al. (1995) in [1]	1.0	0.1	6.80E-02
Aroclor-1260	none	none	none	none	none	none	none	none	none	No TRV
Benzene	Mouse	3.00E-02	2.64E+02	chronic	LOAEL	Reproduction	Nawrot and Staples (1979) in [1]	1.0	0.1	2.64E+01
Benzo(a)anthracene	none	none	none	none	none	none	none	none	none	No TRV

Appendix Table R-41. Derivation of No Observed Adverse Effect Level (NOAEL) Toxicity Reference Values (TRVs) for Mammal Test Species

Ecological constituent of potential concern	Test species	Test species body weight (kg) BW_t	Benchmark (mg/kgBW/d)	Test duration	Endpoint	Effect	Source	Duration conversion factor DCF	Endpoint conversion factor ECF	TRV (mg/kgBW/d) benchmark *x* DCF *x* ECF
Benzo(a)pyrene	Mouse	3.00E-02	1.00E+01	chronic	LOAEL	Reproduction	Mackenzie and Angevine (1981) in [1]	1.0	0.1	1.00E+00
Benzo(b)fluoranthene	none	none	none	none	none	none	none	none	none	No TRV
Benzo(g,h,i)perylene	none	none	none	none	none	none	none	none	none	No TRV
Benzo(k)fluoranthene	none	none	none	none	none	none	none	none	none	No TRV
Benzoic acid	Mouse	0.03	40	chronic	LOAEL	unknown	Shtenberg and Ignat'ev (1970) in [3]	1.0	0.1	4.00E+00
Benzyl alcohol	none	none	none	none	none	none	none	none	none	No TRV
Bis(2-chloroisopropyl)ether	none	none	none	none	none	none	none	none	none	No TRV
Bis(2-ethylhexyl)phthalate	Mouse	3.00E-02	1.83E+01	chronic	NOAEL	Reproduction	Lamb et al. (1987) in [1]	1.0	1.0	1.83E+01
Butylbenzylphthalate	none	none	none	none	none	none	none	none	none	No TRV
Carbazole	none	none	none	none	none	none	none	none	none	No TRV
Carbon disulfide	none	none	none	none	none	none	none	none	none	No TRV
Chlordane	Mouse	3.00E-02	4.58E+00	chronic	NOAEL	Reproduction	Keplinger et al. (1968) in [1]	1.0	1.0	4.58E+00
Chlorobenzene	none	none	none	none	none	none	none	none	none	No TRV
Chloroethane	none	none	none	none	none	none	none	none	none	No TRV
Chloroform	Rat	3.50E-01	1.50E+02	subchronic	NOAEL	Gonad atrophy	Palmer et al. (1979) in [1]	0.1	1.0	1.50E+01
m,p-cresol	none	none	none	none	none	none	none	none	none	No TRV
Chrysene	none	none	none	none	none	none	none	none	none	No TRV
Dalapon	none	none	none	none	none	none	none	none	none	No TRV
delta-BHC	none	none	none	none	none	none	none	none	none	No TRV
Dibenzo(a,h)anthracene	none	none	none	none	none	none	none	none	none	No TRV
Dibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
Dicamba	none	none	none	none	none	none	none	none	none	No TRV
Dichloroprop	none	none	none	none	none	none	none	none	none	No TRV
Dieldrin	Rat	3.50E-01	2.00E-01	Chronic	Loael	Reproduction	Treon and Cleveland (1955) in [1]	1.0	0.1	2.00E-02
Diethylphthalate	Mouse	3.00E-02	4.58E+03	chronic	NOAEL	Reproduction	Lamb et al. (1987) in [1]	1.0	1.0	4.58E+03
Di-n-butylphthalate	Mouse	3.00E-02	5.50E+02	chronic	NOAEL	Reproduction	Lamb et al. (1987) in [1]	1.0	1.0	5.50E+02
Di-n-octylphthalate	none	none	none	none	none	none	none	none	none	No TRV
Endosulfan	Rat	3.50E-01	1.50E+00	subchronic	NOAEL	Reproduction	Dikshith et al.(1984) in [1]	0.1	1.0	1.50E-01
Endosulfan sulfate	none	none	none	none	none	none	none	none	none	No TRV
Endrin	Mouse	3.00E-02	9.20E-01	chronic	LOAEL	Reproduction	Good and Ware (1969) in [1]	1.0	0.1	9.20E-02
Endrin ketone	none	none	none	none	none	none	none	none	none	No TRV
Ethylbenzene	none	none	none	none	none	none	none	none	none	No TRV
Fluoranthene	none	none	none	none	none	none	none	none	none	No TRV
Fluorene	none	none	none	none	none	none	none	none	none	No TRV
gamma-Chlordane	Mouse	3.00E-02	4.58E+00	chronic	NOAEL	Reproduction	Keplinger et al. (1968) in [1]	1.0	1.0	4.58E+00
gamma-BHC (Lindane)	Rat	3.50E-01	8.00E+00	chronic	NOAEL	Reproduction	Palmer et al. (1978) in [1]	1.0	1.0	8.00E+00
Heptachlor	Mink	1.00E+00	1.00E+00	chronic	LOAEL	Reproduction	Crumet al. (1993) in [1]	1.0	0.1	1.00E-01
Heptachlor epoxide	none	none	none	none	none	none	none	none	none	No TRV
Indeno(1,2,3-cd)pyrene	none	none	none	none	none	none	none	none	none	No TRV
MCPA	none	none	none	none	none	none	none	none	none	No TRV
MCPP	none	none	none	none	none	none	none	none	none	No TRV
Methyl bromide	none	none	none	none	none	none	none	none	none	No TRV
Methyl ethyl ketone	Rat	3.50E-01	1.77E+03	chronic	NOAEL	Reproduction	Cox et al. (1975) in [1]	1.0	1.0	1.77E+03
Methyl mercury chloride	Rat	3.50E-01	3.20E-02	chronic	NOAEL	Reproduction	Verschuuren et al. (1976) in [1]	1.0	1.0	3.20E-02
Methylene chloride	Rat	3.50E-01	5.85E+00	chronic	NOAEL	Liver histology	NCA (1982) in [1]	1.0	1.0	5.85E+00
Methoxychlor	Rat	3.50E-01	4.00E+00	chronic	NOAEL	Reproduction	Gray et al. (1988) in [1]	none	none	4.00E+00
Naphthalene	none	none	none	none	none	none	none	none	none	No TRV
N-Nitroso-di-N-propylamine	none	none	none	none	none	none	none	none	none	No TRV
N-Nitrosodiphenylamine	none	none	none	none	none	none	none	none	none	No TRV
Pentachlorophenol	Rat	3.50E-01	2.40E-01	chronic	NOAEL	Reproduction	Schwetz et al. (1978) in [1]	1.0	1.0	2.40E-01

Appendix Table R-41. Derivation of No Observed Adverse Effect Level (NOAEL) Toxicity Reference Values (TRVs) for Mammal Test Species

Ecological constituent of potential concern	Test species	Test species body weight (kg) BW_t	Benchmark (mg/kgBW/d)	Test duration	Endpoint	Effect	Source	Duration conversion factor DCF	Endpoint conversion factor ECF	TRV (mg/kgBW/d) benchmark *x* DCF *x* ECF
Phenanthrene	none	none	none	none	none	none	none	none	none	No TRV
Phenol	none	none	none	none	none	none	none	none	none	No TRV
Pyrene	none	none	none	none	none	none	none	none	none	No TRV
Styrene	Dog	1.00E+01	2.00E+02	chronic	NOAEL	unknown	Quast et al. (1979)	1.0	1.0	2.00E+02
Tetrachloroethene	Mouse	3.00E-02	1.40E+01	subchronic	NOAEL	Hepatotoxicity	Buben and O'Flaherty (1985) in [1]	0.1	1.0	1.40E+00
Toluene	Mouse	3.00E-02	2.60E+02	chronic	LOAEL	Reproduction	Nawrot and Staples (1979) in [1]	1.0	0.1	2.60E+01
Trichloroethene	Mouse	3.00E-02	7.00E+01	subchronic	LOAEL	Hepatotoxicity	Buben and O'Flaherty (1985) in [1]	0.1	0.1	7.00E-01
Vinyl chloride	Rat	3.50E-01	1.70E+00	chronic	LOAEL	Mortality	Feron et al. (1981) in [1]	1.0	0.1	1.70E-01
Xylenes, total	Mouse	3.00E-02	2.06E+00	chronic	NOAEL	Reproduction	Marks et al. (1982) in [1]	1.0	1.0	2.06E+00
Dioxins and Furans										
1,2,3,4,6,7,8-Heptachlorodibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,4,7,8,9-Heptachlorodibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,4,7,8-Hexachlorodibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,6,7,8-Hexachlorodibenzofuran	Rat	3.50E-01	1.60E-03	subchronic	NOAEL	Organ weight	Poiger et al. (1989) in [1]	0.1	1.0	1.60E-04
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,7,8,9-Hexachlorodibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,7,8-Pentachlorodibenzofuran	Rat	3.50E-01	1.60E-03	subchronic	NOAEL	Organ weight	Poiger et al. (1989) in [1]	0.1	1.0	1.60E-04
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	none	none	none	none	none	none	none	none	none	No TRV
2,3,4,6,7,8-Hexachlorodibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
2,3,4,7,8-Pentachlorodibenzofuran	Rat	3.50E-01	1.60E-04	subchronic	NOAEL	Organ weight	Poiger et al. (1989) in [1]	0.1	1.0	1.60E-05
2,3,7,8-Tetrachlorodibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
2,3,7,8-Tetrachlorodibenzo-p-dioxin	Rat	3.50E-01	1.00E-06	chronic	NOAEL	Reproduction	Murray et al. (1979) in [1]	1.0	1.0	1.00E-06
Octachlorodibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
Octachlorodibenzo-p-dioxin	none	none	none	none	none	none	none	none	none	No TRV
Explosives										
1,3,5-Trinitrobenzene	none	none	none	none	none	none	none	none	none	No TRV
1,3-Dinitrobenzene	none	none	none	none	none	none	none	none	none	No TRV
2,4,6-Trinitrotoluene	Rat	3.50E-01	1.60E+02	subchronic	LOAEL	Reproduction	Dilley et al. (1982)	0.1	0.1	1.60E+00
2,4-Dinitrotoluene	Mouse	3.00E-02	1.35E+01	chronic	NOAEL	Reproduction	Ellis et al. (1979)	1.0	1.0	1.35E+01
2,6-Dinitrotoluene	Rat	3.50E-01	7.00E+00	subchronic	NOAEL	Reproduction	ATSDR (1989)	0.1	1.0	7.00E-01
2-Amino-4,6-dinitrotoluene	none	none	none	none	none	none	none	none	none	No TRV
4-Amino-2,6-dinitrotoluene	none	none	none	none	none	none	none	none	none	No TRV
Nitrobenzene	none	none	none	none	none	none	none	none	none	No TRV
Tetryl	none	none	none	none	none	none	none	none	none	No TRV

TRV = toxicity reference value
DCF = Duration conversion factor; 1 if chronic, 0.1 if subchronic (Sample et al. 1996)
ECF = Endpoint conversion factor; 1 if NOAEL, 0.1 if LOAEL (Sample et al. 1996)
NOAEL = No observed adverse effect level
LOAEL = Lowest observed adverse effect level
[1] = Sample et al. (1996)
[2] = Clayton and Clayton (1981)
[3] = IRIS (1996)

Appendix Table R-42. Body-Weight-Adjusted NOAEL Toxicity Reference Values (TRVs) for Mammal Receptors at Load Line 4, Ravenna, Ohio

Ecological constituent of potential concern	Test species	Test species body weight (kg)	TRV_t (mg/kgBW/d)	Short-tailed shrew		Cottontail		Mink		Muskrat		Red Fox	
				Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	TRV (mg/kgBW/d) $TRV_t x BW_{conv}$	Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	TRV (mg/kgBW/d) $TRV_t x BW_{conv}$	Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	TRV (mg/kgBW/d) $TRV_t x BW_{conv}$	Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	TRV (mg/kgBW/d) $TRV_t x BW_{conv}$	Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	TRV (mg/kgBW/d) $TRV_t x BW_{conv}$
Inorganics													
Aluminum	Mouse	3.00E-02	1.93E+00	1.15E+00	2.22E+00	3.96E-01	7.64E-01	4.14E-01	7.99E-01	4.00E-01	7.72E-01	2.85E-01	5.50E-01
Ammonia	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Antimony	Mouse	3.00E-02	1.25E-01	1.15E+00	1.44E-01	3.96E-01	4.95E-02	4.14E-01	5.18E-02	4.00E-01	5.00E-02	2.85E-01	3.56E-02
Arsenic	Mouse	3.00E-02	1.26E-01	1.15E+00	1.45E-01	3.96E-01	4.99E-02	4.14E-01	5.22E-02	4.00E-01	5.04E-02	2.85E-01	3.59E-02
Arsenic (dissolved)	Mouse	3.00E-02	1.26E-01	1.15E+00	1.45E-01	3.96E-01	4.99E-02	4.14E-01	5.22E-02	4.00E-01	5.04E-02	2.85E-01	3.59E-02
Barium	Rat	4.35E-01	5.06E+00	2.25E+00	1.14E+01	7.73E-01	3.91E+00	8.08E-01	4.09E+00	7.81E-01	3.95E+00	5.57E-01	2.82E+00
Barium (dissolved)	Rat	4.35E-01	5.06E+00	2.25E+00	1.14E+01	7.73E-01	3.91E+00	8.08E-01	4.09E+00	7.81E-01	3.95E+00	5.57E-01	2.82E+00
Beryllium	Rat	3.50E-01	6.60E-01	2.13E+00	1.41E+00	7.32E-01	4.83E-01	7.65E-01	5.05E-01	7.39E-01	4.88E-01	5.27E-01	3.48E-01
Beryllium (dissolved)	Rat	3.50E-01	6.60E-01	2.13E+00	1.41E+00	7.32E-01	4.83E-01	7.65E-01	5.05E-01	7.39E-01	4.88E-01	5.27E-01	3.48E-01
Boron	Rat	3.50E-01	2.80E+01	2.13E+00	5.96E+01	7.32E-01	2.05E+01	7.65E-01	2.14E+01	7.39E-01	2.07E+01	5.27E-01	1.48E+01
Cadmium	Rat	3.03E-01	1.00E+00	2.05E+00	2.05E+00	7.06E-01	7.06E-01	7.38E-01	7.38E-01	7.13E-01	7.13E-01	5.08E-01	5.08E-01
Cadmium (dissolved)	Rat	3.03E-01	1.00E+00	2.05E+00	2.05E+00	7.06E-01	7.06E-01	7.38E-01	7.38E-01	7.13E-01	7.13E-01	5.08E-01	5.08E-01
Calcium	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Chloride	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Chromium	Rat	3.50E-01	2.74E+03	2.13E+00	5.83E+03	7.32E-01	2.00E+03	7.65E-01	2.09E+03	7.39E-01	2.02E+03	5.27E-01	1.44E+03
Chromium, hexavalent	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Cobalt	Rat	none	1.00E-01	none	none	none	none	none	none	none	none	none	none
Copper	Mink	1.00E+00	1.17E+01	2.77E+00	3.24E+01	9.52E-01	1.11E+01	9.95E-01	1.17E+01	9.61E-01	1.13E+01	6.85E-01	8.02E+00
Copper (dissolved)	Mink	1.00E+00	1.17E+01	2.77E+00	3.24E+01	9.52E-01	1.11E+01	9.95E-01	1.17E+01	9.61E-01	1.13E+01	6.85E-01	8.02E+00
Cyanide	Rat	2.73E-01	6.87E+01	2.00E+00	1.38E+02	6.88E-01	4.73E+01	7.19E-01	4.94E+01	6.95E-01	4.77E+01	4.95E-01	3.40E+01
Fluoride	Mink	1.00E+00	3.14E+01	2.77E+00	8.69E+01	9.52E-01	2.98E+01	9.95E-01	3.12E+01	9.61E-01	3.02E+01	6.85E-01	2.15E+01
Iron	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Lead	Rat	3.50E-01	8.00E+00	2.13E+00	1.70E+01	7.32E-01	5.85E+00	7.65E-01	6.12E+00	7.39E-01	5.92E+00	5.27E-01	4.22E+00
Lead (dissolved)	Rat	3.50E-01	8.00E+00	2.13E+00	1.70E+01	7.32E-01	5.85E+00	7.65E-01	6.12E+00	7.39E-01	5.92E+00	5.27E-01	4.22E+00
Magnesium	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Manganese	Rat	3.50E-01	8.80E+01	2.13E+00	1.87E+02	7.32E-01	6.44E+01	7.65E-01	6.74E+01	7.39E-01	6.51E+01	5.27E-01	4.64E+01
Mercury	Mink	1.00E+00	1.01E+00	2.77E+00	2.80E+00	9.52E-01	9.61E-01	9.95E-01	1.01E+00	9.61E-01	9.71E-01	6.85E-01	6.92E-01
Molybdenum	Mouse	3.00E-02	2.58E-01	1.15E+00	2.98E-01	3.96E-01	1.02E-01	4.14E-01	1.07E-01	4.00E-01	1.03E-01	2.85E-01	7.37E-02
Nickel	Rat	3.50E-01	4.00E+01	2.13E+00	8.52E+01	7.32E-01	2.93E+01	7.65E-01	3.06E+01	7.39E-01	2.96E+01	5.27E-01	2.11E+01
Nickel (dissolved)	Rat	3.50E-01	4.00E+01	2.13E+00	8.52E+01	7.32E-01	2.93E+01	7.65E-01	3.06E+01	7.39E-01	2.96E+01	5.27E-01	2.11E+01
Nitrate	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Phosphorus	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Potassium	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Selenium	Rat	3.50E-01	2.00E-01	2.13E+00	4.26E-01	7.32E-01	1.46E-01	7.65E-01	1.53E-01	7.39E-01	1.48E-01	5.27E-01	1.05E-01
Silver	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Silicon	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Sodium	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Sulfate	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Thallium	Rat	3.65E-01	7.40E-03	2.15E+00	1.59E-02	7.40E-01	5.47E-03	7.73E-01	5.72E-03	7.47E-01	5.53E-03	5.33E-01	3.94E-03
Vanadium	Rat	2.60E-01	2.10E-01	1.98E+00	4.15E-01	6.79E-01	1.43E-01	7.11E-01	1.49E-01	6.86E-01	1.44E-01	4.89E-01	1.03E-01
Zinc	Rat	3.50E-01	1.60E+02	2.13E+00	3.41E+02	7.32E-01	1.17E+02	7.65E-01	1.22E+02	7.39E-01	1.18E+02	5.27E-01	8.43E+01
Organics													
1,1,1-Trichloroethane	Mouse	3.50E-02	1.00E+03	1.20E+00	1.20E+03	4.12E-01	4.12E+02	4.30E-01	4.30E+02	4.16E-01	4.16E+02	2.96E-01	2.96E+02
1,1,2,2-Tetrachloroethane	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,1,2-Trichloroethane	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,1-Dichloroethane	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,1-Dichloroethene	Rat	3.50E-01	3.00E+01	2.13E+00	6.39E+01	7.32E-01	2.20E+01	7.65E-01	2.30E+01	7.39E-01	2.22E+01	5.27E-01	1.58E+01
1,1-Dichloroethene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,2,3,4,6,7,8-HpCDF	none	none	No TRV	none	none	none	none	none	none	none	none	none	none

Appendix Table R-42. Body-Weight-Adjusted NOAEL Toxicity Reference Values (TRVs) for Mammal Receptors at Load Line 4, Ravenna, Ohio

				Short-tailed shrew		Cottontail		Mink		Muskrat		Red Fox	
Ecological constituent of potential concern	Test species	Test species body weight (kg)	TRV_t (mg/kgBW/d)	Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	TRV (mg/kgBW/d) $TRV_t \times BW_{conv}$	Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	TRV (mg/kgBW/d) $TRV_t \times BW_{conv}$	Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	TRV (mg/kgBW/d) $TRV_t \times BW_{conv}$	Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	TRV (mg/kgBW/d) $TRV_t \times BW_{conv}$	Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	TRV (mg/kgBW/d) $TRV_t \times BW_{conv}$
1,2,4-trichlorobenzene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,2-cis-Dichloroethene	Mouse	3.00E-02	4.52E+00	1.15E+00	5.21E+00	3.96E-01	1.79E+00	4.14E-01	1.87E+00	4.00E-01	1.81E+00	2.85E-01	1.29E+00
1,2-Dichlorobenzene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,2-Dichlorobenzene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,2-Dichloroethane	Mouse	3.50E-02	5.00E+01	1.20E+00	5.99E+01	4.12E-01	2.06E+01	4.30E-01	2.15E+01	4.16E-01	2.08E+01	2.96E-01	1.48E+01
1,2-Dichloroethane	Mouse	3.50E-02	5.00E+01	1.20E+00	5.99E+01	4.12E-01	2.06E+01	4.30E-01	2.15E+01	4.16E-01	2.08E+01	2.96E-01	1.48E+01
1,2-Dichloroethene	Mouse	3.00E-02	4.52E+01	1.15E+00	5.21E+01	3.96E-01	1.79E+01	4.14E-01	1.87E+01	4.00E-01	1.81E+01	2.85E-01	1.29E+01
1,2-Dichloroethene	Mouse	3.00E-02	4.52E+00	1.15E+00	5.21E+00	3.96E-01	1.79E+00	4.14E-01	1.87E+00	4.00E-01	1.81E+00	2.85E-01	1.29E+00
1,2-Dichloropropane	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,2-trans-Dichloroethene	Mouse	3.00E-02	4.52E+00	1.15E+00	5.21E+00	3.96E-01	1.79E+00	4.14E-01	1.87E+00	4.00E-01	1.81E+00	2.85E-01	1.29E+00
1,3-Dichlorobenzene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,4-Dichlorobenzene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
2,2,5-Trimethylhexane	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
2,4,5-trichlorophenol	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
2,4-D	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
2,4-Dimethylphenol	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
2-Chlorophenol	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
2-Hexanone	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
2-Methylnaphthalene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
2-Methylnaphthalene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
2-Methylphenol	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
4,4'-DDD	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
4,4'-DDE	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
4,4'-DDT	Rat	3.50E-01	8.00E-01	2.13E+00	1.70E+00	7.32E-01	5.85E-01	7.65E-01	6.12E-01	7.39E-01	5.92E-01	5.27E-01	4.22E-01
4-Chloro-3-methylphenol	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
4-Methyl-2-pentanone	Rat	3.50E-01	2.50E+01	2.13E+00	5.33E+01	7.32E-01	1.83E+01	7.65E-01	1.91E+01	7.39E-01	1.85E+01	5.27E-01	1.32E+01
4-Methylphenol	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
4-Methylphenol	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
4-Nitrophenol	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Acenaphthene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Acenaphthylene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Acetone	Rat	3.50E-01	1.00E+01	2.13E+00	2.13E+01	7.32E-01	7.32E+00	7.65E-01	7.65E+00	7.39E-01	7.39E+00	5.27E-01	5.27E+00
Aldrin	Rat	3.50E-01	2.00E-01	2.13E+00	4.26E-01	7.32E-01	1.46E-01	7.65E-01	1.53E-01	7.39E-01	1.48E-01	5.27E-01	1.05E-01
Alkalinity	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
alpha-Chlordane	Mouse	3.00E-02	4.58E+00	1.15E+00	5.28E+00	3.96E-01	1.81E+00	4.14E-01	1.90E+00	4.00E-01	1.83E+00	2.85E-01	1.31E+00
Anthracene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Aroclor-1242	Mink	1.00E+00	6.85E-02	2.77E+00	1.90E-01	9.52E-01	6.52E-02	9.95E-01	6.82E-02	9.61E-01	6.58E-02	6.85E-01	4.69E-02
Aroclor-1248	Rhesus monkey	5.00E+00	1.00E-02	4.14E+00	4.14E-02	1.42E+00	1.42E-02	1.49E+00	1.49E-02	1.44E+00	1.44E-02	1.02E+00	1.02E-02
Aroclor-1254	Oldfield mouse	1.40E-02	6.80E-02	9.53E-01	6.48E-02	3.27E-01	2.23E-02	3.42E-01	2.33E-02	3.31E-01	2.25E-02	2.36E-01	1.60E-02
Aroclor-1260	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Benzene	Mouse	3.00E-02	2.64E+01	1.15E+00	3.04E+01	3.96E-01	1.04E+01	4.14E-01	1.09E+01	4.00E-01	1.05E+01	2.85E-01	7.52E+00
Benzo(a)anthracene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Benzo(a)pyrene	Mouse	3.00E-02	1.00E+00	1.15E+00	1.15E+00	3.96E-01	3.96E-01	4.14E-01	4.14E-01	4.00E-01	4.00E-01	2.85E-01	2.85E-01
Benzo(b)fluoranthene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Benzo(g,h,i)perylene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Benzo(k)fluoranthene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Benzoic acid	Mouse	3.00E-02	4.00E+00	1.15E+00	4.61E+00	3.96E-01	1.58E+00	4.14E-01	1.66E+00	4.00E-01	1.60E+00	2.85E-01	1.14E+00
Benzyl alcohol	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Bis(2-chloroisopropyl)ether	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Bis(2-ethylhexyl)phthalate	Mouse	3.00E-02	1.83E+01	1.15E+00	2.11E+01	3.96E-01	7.25E+00	4.14E-01	7.58E+00	4.00E-01	7.32E+00	2.85E-01	5.22E+00
Butylbenzylphthalate	none	none	No TRV	none	none	none	none	none	none	none	none	none	none

Appendix Table R-42. Body-Weight-Adjusted NOAEL Toxicity Reference Values (TRVs) for Mammal Receptors at Load Line 4, Ravenna, Ohio

				Short-tailed shrew		Cottontail		Mink		Muskrat		Red Fox	
Ecological constituent of potential concern	Test species	Test species body weight (kg)	TRV_t (mg/kgBW/d)	Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	TRV (mg/kgBW/d) TRV_t x BW_{conv}	Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	TRV (mg/kgBW/d) TRV_t x BW_{conv}	Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	TRV (mg/kgBW/d) TRV_t x BW_{conv}	Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	TRV (mg/kgBW/d) TRV_t x BW_{conv}	Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	TRV (mg/kgBW/d) TRV_t x BW_{conv}
beta-BHC	Rat	3.50E-01	4.00E-01	2.13E+00	8.52E-01	7.32E-01	2.93E-01	7.65E-01	3.06E-01	7.39E-01	2.96E-01	5.27E-01	2.11E-01
Carbon disulfide	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Chlordane	Mouse	3.00E-02	4.58E+00	1.15E+00	5.28E+00	3.96E-01	1.81E+00	4.14E-01	1.90E+00	4.00E-01	1.83E+00	2.85E-01	1.31E+00
Chlorobenzene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Chloroethane	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Chloroform	Rat	3.50E-01	1.50E+01	2.13E+00	3.20E+01	7.32E-01	1.10E+01	7.65E-01	1.15E+01	7.39E-01	1.11E+01	5.27E-01	7.91E+00
m,p-cresol	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Chrysene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Dalapon	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
delta-BHC	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Dibenzo(a,h)anthracene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Dibenzofuran	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Dicamba	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Dichloroprop	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Dieldrin	Rat	3.50E-01	2.00E-02	2.13E+00	4.26E-02	7.32E-01	1.46E-02	7.65E-01	1.53E-02	7.39E-01	1.48E-02	5.27E-01	1.05E-02
Diethylphthalate	Mouse	3.00E-02	4.58E+03	1.15E+00	5.28E+03	3.96E-01	1.81E+03	4.14E-01	1.90E+03	4.00E-01	1.83E+03	2.85E-01	1.31E+03
Di-n-butylphthalate	Mouse	3.00E-02	5.50E+02	1.15E+00	6.34E+02	3.96E-01	2.18E+02	4.14E-01	2.28E+02	4.00E-01	2.20E+02	2.85E-01	1.57E+02
Di-n-octylphthalate	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Endosulfan	Rat	3.50E-01	1.50E-01	2.13E+00	3.20E-01	7.32E-01	1.10E-01	7.65E-01	1.15E-01	7.39E-01	1.11E-01	5.27E-01	7.91E-02
Endosulfan sulfate	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Endrin	Mouse	3.00E-02	9.20E-02	1.15E+00	1.06E-01	3.96E-01	3.64E-02	4.14E-01	3.81E-02	4.00E-01	3.68E-02	2.85E-01	2.62E-02
Endrin ketone	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Ethylbenzene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Fluoranthene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Fluorene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
gamma-Chlordane	Mouse	3.00E-02	4.58E+00	1.15E+00	5.28E+00	3.96E-01	1.81E+00	4.14E-01	1.90E+00	4.00E-01	1.83E+00	2.85E-01	1.31E+00
gamma-BHC (Lindane)	Rat	3.50E-01	8.00E+00	2.13E+00	1.70E+01	7.32E-01	5.85E+00	7.65E-01	6.12E+00	7.39E-01	5.92E+00	5.27E-01	4.22E+00
Heptachlor	Mink	1.00E+00	1.00E-01	2.77E+00	2.77E-01	9.52E-01	9.52E-02	9.95E-01	9.95E-02	9.61E-01	9.61E-02	6.85E-01	6.85E-02
Heptachlor epoxide	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Indeno(1,2,3-cd)pyrene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
MCPA	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
MCPP	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Methyl bromide	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Methyl ethyl ketone	Rat	3.50E-01	1.77E+03	2.13E+00	3.77E+03	7.32E-01	1.30E+03	7.65E-01	1.36E+03	7.39E-01	1.31E+03	5.27E-01	9.33E+02
Methyl mercury chloride	Rat	3.50E-01	3.20E-02	2.13E+00	6.82E-02	7.32E-01	2.34E-02	7.65E-01	2.45E-02	7.39E-01	2.37E-02	5.27E-01	1.69E-02
Methylene chloride	Rat	3.50E-01	5.85E+00	2.13E+00	1.25E+01	7.32E-01	4.28E+00	7.65E-01	4.48E+00	7.39E-01	4.33E+00	5.27E-01	3.08E+00
Methoxychlor	Rat	3.50E-01	4.00E+00	2.13E+00	8.52E+00	7.32E-01	2.93E+00	7.65E-01	3.06E+00	7.39E-01	2.96E+00	5.27E-01	2.11E+00
Naphthalene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
N-Nitroso-di-N-propylamine	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
N-Nitrosodiphenylamine	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Pentachlorophenol	Rat	3.50E-01	2.40E-01	2.13E+00	5.11E-01	7.32E-01	1.76E-01	7.65E-01	1.84E-01	7.39E-01	1.77E-01	5.27E-01	1.26E-01
Phenanthrene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Phenol	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Pyrene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Styrene	Dog	1.00E+01	2.00E+02	4.92E+00	9.85E+02	1.69E+00	3.38E+02	1.77E+00	3.54E+02	1.71E+00	3.42E+02	1.22E+00	2.44E+02
Tetrachloroethene	Mouse	3.00E-02	1.40E+00	1.15E+00	1.61E+00	3.96E-01	5.54E-01	4.14E-01	5.80E-01	4.00E-01	5.60E-01	2.85E-01	3.99E-01
Toluene	Mouse	3.00E-02	2.60E+01	1.15E+00	2.99E+01	3.96E-01	1.03E+01	4.14E-01	1.08E+01	4.00E-01	1.04E+01	2.85E-01	7.41E+00
Trichloroethene	Mouse	3.00E-02	7.00E-01	1.15E+00	8.07E-01	3.96E-01	2.77E-01	4.14E-01	2.90E-01	4.00E-01	2.80E-01	2.85E-01	2.00E-01
Vinyl chloride	Rat	3.50E-01	1.70E-01	2.13E+00	3.62E-01	7.32E-01	1.24E-01	7.65E-01	1.30E-01	7.39E-01	1.26E-01	5.27E-01	8.96E-02
Xylenes, total	Mouse	3.00E-02	2.06E+00	1.15E+00	2.37E+00	3.96E-01	8.16E-01	4.14E-01	8.53E-01	4.00E-01	8.24E-01	2.85E-01	5.87E-01

Appendix Table R-42. Body-Weight-Adjusted NOAEL Toxicity Reference Values (TRVs) for Mammal Receptors at Load Line 4, Ravenna, Ohio

Ecological constituent of potential concern	Test species	Test species body weight (kg)	TRV_t (mg/kgBW/d)	Short-tailed shrew: Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	Short-tailed shrew: TRV (mg/kgBW/d) $TRV_t \, x \, BW_{conv}$	Cottontail: Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	Cottontail: TRV (mg/kgBW/d) $TRV_t \, x \, BW_{conv}$	Mink: Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	Mink: TRV (mg/kgBW/d) $TRV_t \, x \, BW_{conv}$	Muskrat: Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	Muskrat: TRV (mg/kgBW/d) $TRV_t \, x \, BW_{conv}$	Red Fox: Body-weight conversion factor BW_{conv} $(BW_t / BW)^{0.25}$	Red Fox: TRV (mg/kgBW/d) $TRV_t \, x \, BW_{conv}$
Dioxins and Furans													
1,2,3,4,6,7,8-Heptachlorodibenzofura	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,2,3,4,6,7,8-Heptachlorodibenzo-p-d	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,2,3,4,7,8,9-Heptachlorodibenzofura	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,2,3,4,7,8-Hexachlorodibenzofuran	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,2,3,4,7,8-Hexachlorodibenzo-p-dio	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,2,3,6,7,8-Hexachlorodibenzofuran	Rat	3.50E-01	1.60E-04	2.13E+00	3.41E-04	7.32E-01	1.17E-04	7.65E-01	1.22E-04	7.39E-01	1.18E-04	5.27E-01	8.43E-05
1,2,3,6,7,8-Hexachlorodibenzo-p-dio	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,2,3,7,8,9-Hexachlorodibenzofuran	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,2,3,7,8,9-Hexachlorodibenzo-p-dio	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,2,3,7,8-Pentachlorodibenzofuran	Rat	3.50E-01	1.60E-04	2.13E+00	3.41E-04	7.32E-01	1.17E-04	7.65E-01	1.22E-04	7.39E-01	1.18E-04	5.27E-01	8.43E-05
1,2,3,7,8-Pentachlorodibenzo-p-dioxi	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
2,3,4,6,7,8-Hexachlorodibenzofuran	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
2,3,4,7,8-Pentachlorodibenzofuran	Rat	3.50E-01	1.60E-05	2.13E+00	3.41E-05	7.32E-01	1.17E-05	7.65E-01	1.22E-05	7.39E-01	1.18E-05	5.27E-01	8.43E-06
2,3,7,8-Tetrachlorodibenzofuran	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
2,3,7,8-Tetrachlorodibenzo-p-dioxin	Rat	3.50E-01	1.00E-06	2.13E+00	2.13E-06	7.32E-01	7.32E-07	7.65E-01	7.65E-07	7.39E-01	7.39E-07	5.27E-01	5.27E-07
Octachlorodibenzofuran	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Octachlorodibenzo-p-dioxin	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Explosives													
1,3,5-Trinitrobenzene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
1,3-Dinitrobenzene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
2,4,6-Trinitrotoluene	Rat	3.50E-01	1.60E+00	2.13E+00	3.41E+00	7.32E-01	1.17E+00	7.65E-01	1.22E+00	7.39E-01	1.18E+00	5.27E-01	8.43E-01
2,4-Dinitrotoluene	Mouse	3.00E-02	1.35E+01	1.15E+00	1.56E+01	3.96E-01	5.35E+00	4.14E-01	5.59E+00	4.00E-01	5.40E+00	2.85E-01	3.85E+00
2,6-Dinitrotoluene	Rat	3.50E-01	7.00E-01	2.13E+00	1.49E+00	7.32E-01	5.12E-01	7.65E-01	5.36E-01	7.39E-01	5.18E-01	5.27E-01	3.69E-01
2-Amino-4,6-dinitrotoluene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
4-Amino-2,6-dinitrotoluene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Nitrobenzene	none	none	No TRV	none	none	none	none	none	none	none	none	none	none
Tetryl	none	none	No TRV	none	none	none	none	none	none	none	none	none	none

NOAEL = no observed adverse effect level
TRV = toxicity reference value
BW(kg) Red fox = 4.535
BW(kg) Muskrat = 1.171
BW(kg) Short-tailed shrew = 0.017
BW(kg) cottontail = 1.22
BW(kg) Mink = 1.02

Appendix Table R-43. Derivation of No observed Adverse Effect Level (NOAEL) Toxicity Reference Values (TRVs) for Bird Test Species at Load Line 4, Ravenna, Ohio

Ecological constituent of potential concern	Test species	Test species body weight (kg) BW_t	Benchmark (mg/kgBW/d)	Test duration	Endpoint	Effect	Source	Duration conversion factor DCF	Endpoint conversion factor ECF	TRV (mg/kgBW/d) benchmark *x* DCF *x* ECF
Metals										
Aluminum	Ringed dove	1.55E-01	1.10E+02	chronic	NOAEL	Reproduction	Carriere et al. (1986) in [1]	1.0	1.0	1.10E+02
Ammonia	none	none	none	none	none	none	none	none	none	No TRV
Antimony	none	none	none	none	none	none	none	none	none	No TRV
Arsenic	Mallard duck	1.00E+00	5.14E+00	chronic	NOAEL	Mortality	USFWS (1979) in [1]	1.0	1.0	5.14E+00
Arsenic (dissolved)	Mallard duck	1.00E+00	5.14E+00	chronic	NOAEL	Mortality	USFWS (1979) in [1]	1.0	1.0	5.14E+00
Barium	Chick (14 day old)	1.21E-01	2.08E+02	subchronic	NOAEL	Mortality	Johnson et al. (1960) in [1]	0.1	1.0	2.08E+01
Barium (dissolved)	Chick (14 day old)	1.21E-01	2.08E+02	subchronic	NOAEL	Mortality	Johnson et al. (1960) in [1]	0.1	1.0	2.08E+01
Beryllium	none	none	none	none	none	none	none	none	none	No TRV
Beryllium (dissolved)	none	none	none	none	none	none	none	none	none	No TRV
Boron	Mallard duck	1.00E+00	2.88E+01	chronic	NOAEL	Reproduction	Smith and Anders (1989) in [1]	1.0	1.0	2.88E+01
Cadmium	Mallard duck	1.15E+00	1.45E+00	chronic	NOAEL	Reproduction	White and Finley (1978) in [1]	1.0	1.0	1.45E+00
Cadmium (dissolved)	Mallard duck	1.15E+00	1.45E+00	chronic	NOAEL	Reproduction	White and Finley (1978) in [1]	1.0	1.0	1.45E+00
Calcium	none	none	none	none	none	none	none	none	none	No TRV
Chloride	none	none	none	none	none	none	none	none	none	No TRV
Chromium	Black duck	1.25E+00	1.00E+00	chronic	NOAEL	Reproduction	Haseltine et al. (unpubl.) in [1]	1.0	1.0	1.00E+00
Chromium, hexavalent	none	none	none	none	none	none	none	none	none	No TRV
Cobalt	none	none	none	none	none	none	none	none	none	No TRV
Copper	Chick (5 week old)	5.34E-01	4.70E+01	chronic	NOAEL	Mortality	Mehring et al. (1960) in [1]	1.0	1.0	4.70E+01
Copper (dissolved)	Chick (5 week old)	5.34E-01	4.70E+01	chronic	NOAEL	Mortality	Mehring et al. (1960) in [1]	1.0	1.0	4.70E+01
Cyanide	none	none	none	none	none	none	none	none	none	No TRV
Fluoride	Screech Owl	1.81E-01	7.80E+00	chronic	NOAEL	Reproduction	Pattee et al. 1988	1.0	1.0	7.80E+00
Iron	none	none	none	none	none	none	none	none	none	No TRV
Lead	Quail	1.50E-01	1.13E+00	chronic	NOAEL	Reproduction	Edens et al. (1976) in [1]	1.0	1.0	1.13E+00
Lead (dissolved)	Quail	1.50E-01	1.13E+00	chronic	NOAEL	Reproduction	Edens et al. (1976) in [1]	1.0	1.0	1.13E+00
Magnesium	none	none	none	none	none	none	none	none	none	No TRV
Manganese	Quail	7.20E-02	9.77E+02	chronic	NOAEL	Growth	Laskey and Edens (1985) in [1]	1.0	1.0	9.77E+02
Mercury	Quail	1.50E-01	4.50E-01	chronic	NOAEL	Reproduction	Hill and Schaffner (1976) in [1]	1.0	1.0	4.50E-01
Molybdenum	Chicken	1.50E+00	3.53E+01	chronic	LOAEL	Reproduction	Lepore and Miller (1965) in [1]	1.0	0.1	3.53E+00
Nickel	Mallard duckling	7.82E-01	7.74E+01	chronic	NOAEL	Growth	Cain and Pafford (1981) in [1]	1.0	1.0	7.74E+01
Nickel (dissolved)	Mallard duckling	7.82E-01	7.74E+01	chronic	NOAEL	Growth	Cain and Pafford (1981) in [1]	1.0	1.0	7.74E+01
Nitrate	none	none	none	none	none	none	none	none	none	No TRV
Phosphorus	none	none	none	none	none	none	none	none	none	No TRV
Potassium	none	none	none	none	none	none	none	none	none	No TRV
Selenium	Mallard duck	1.00E+00	5.00E-01	chronic	NOAEL	Reproduction	Heinz et al. (1989) in [1]	1.0	1.0	5.00E-01
Silver	none	none	none	none	none	none	none	none	none	No TRV
Silicon	none	none	none	none	none	none	none	none	none	No TRV
Sodium	none	none	none	none	none	none	none	none	none	No TRV
Sulfate	none	none	none	none	none	none	none	none	none	No TRV
Thallium	none	none	none	none	none	none	none	none	none	No TRV
Vanadium	Mallard duck	1.17E+00	1.14E+01	chronic	NOAEL	Mortality	White and Dieter (1978) in [1]	1.0	1.0	1.14E+01

Appendix Table R-43. Derivation of No observed Adverse Effect Level (NOAEL) Toxicity Reference Values (TRVs) for Bird Test Species at Load Line 4, Ravenna, Ohio

Ecological constituent of potential concern	Test species	Test species body weight (kg) BW_t	Benchmark (mg/kgBW/d)	Test duration	Endpoint	Effect	Source	Duration conversion factor DCF	Endpoint conversion factor ECF	TRV (mg/kgBW/d) benchmark *x* DCF *x* ECF
Zinc	Leghorn chicken	1.94E+00	1.45E+01	chronic	NOAEL	Reproduction	Stahl et al. (1990) in [1]	1.0	1.0	1.45E+01
Zinc (dissolved)	Leghorn chicken	1.94E+00	1.45E+01	chronic	NOAEL	Reproduction	Stahl et al. (1990) in [1]	1.0	1.0	1.45E+01
Organics										
1,1,1-Trichloroethane	none	none	none	none	none	none	none	none	none	No TRV
1,1,2,2-Tetrachloroethane	none	none	none	none	none	none	none	none	none	No TRV
1,1,2-Trichloroethane	none	none	none	none	none	none	none	none	none	No TRV
1,1-Dichloroethane	none	none	none	none	none	none	none	none	none	No TRV
1,1-Dichloroethene	none	none	none	none	none	none	none	none	none	No TRV
1,1-Dichloroethene	none	none	none	none	none	none	none	none	none	No TRV
1,1-Dichloroethene	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,4,6,7,8-HpCDF	none	none	none	none	none	none	none	none	none	No TRV
1,2,4-trichlorobenzene	none	none	none	none	none	none	none	none	none	No TRV
1,2-cis-Dichloroethene	none	none	none	none	none	none	none	none	none	No TRV
1,2-Dichlorobenzene	none	none	none	none	none	none	none	none	none	No TRV
1,2-Dichloroethane	Chicken	1.60E+00	1.72E+01	chronic	NOAEL	Reproduction	Alumot et al. (1976b) in [1]	1.0	1.0	1.72E+01
1,2-Dichloroethane	none	none	none	none	none	none	none	none	none	No TRV
1,2-Dichloroethene	none	none	none	none	none	none	none	none	none	No TRV
1,2-Dichloroethene	none	none	none	none	none	none	none	none	none	No TRV
1,2-Dichloropropane	none	none	none	none	none	none	none	none	none	No TRV
1,2-trans-Dichloroethene	none	none	none	none	none	none	none	none	none	No TRV
1,3-Dichlorobenzene	none	none	none	none	none	none	none	none	none	No TRV
1,4-Dichlorobenzene	none	none	none	none	none	none	none	none	none	No TRV
2,2,5-Trimethylhexane	none	none	none	none	none	none	none	none	none	No TRV
2,4,5-trichlorophenol	none	none	none	none	none	none	none	none	none	No TRV
2,4-D	none	none	none	none	none	none	none	none	none	No TRV
2,4-Dimethylphenol	none	none	none	none	none	none	none	none	none	No TRV
2-Chlorophenol	none	none	none	none	none	none	none	none	none	No TRV
2-Hexanone	none	none	none	none	none	none	none	none	none	No TRV
2-Methylnaphthalene	none	none	none	none	none	none	none	none	none	No TRV
2-Methylnaphthalene	none	none	none	none	none	none	none	none	none	No TRV
2-Methylphenol	none	none	none	none	none	none	none	none	none	No TRV
4,4'-DDD	none	none	none	none	none	none	none	none	none	No TRV
4,4'-DDE	none	none	none	none	none	none	none	none	none	No TRV
4,4'-DDT	Brown pelican	3.50E+00	2.80E-02	chronic	LOAEL	Reproduction	Anderson et al. (1975) in [1]	1.0	0.1	2.80E-03
4-Chloro-3-methylphenol	none	none	none	none	none	none	none	none	none	No TRV
4-Methyl-2-pentanone	none	none	none	none	none	none	none	none	none	No TRV
4-Methylphenol	none	none	none	none	none	none	none	none	none	No TRV
4-Methylphenol	none	none	none	none	none	none	none	none	none	No TRV
4-Nitrophenol	none	none	none	none	none	none	none	none	none	No TRV
Acenaphthene	none	none	none	none	none	none	none	none	none	No TRV

Appendix Table R-43. Derivation of No observed Adverse Effect Level (NOAEL) Toxicity Reference Values (TRVs) for Bird Test Species at Load Line 4, Ravenna, Ohio

Ecological constituent of potential concern	Test species	Test species body weight (kg) BW_t	Benchmark (mg/kgBW/d)	Test duration	Endpoint	Effect	Source	Duration conversion factor DCF	Endpoint conversion factor ECF	TRV (mg/kgBW/d) benchmark *x* DCF *x* ECF
Acenaphthylene	none	none	none	none	none	none	none	none	none	No TRV
Acetone	none	none	none	none	none	none	none	none	none	No TRV
Alkalinity	none	none	none	none	none	none	none	none	none	No TRV
Aldrin	none	none	none	none	none	none	none	none	none	No TRV
alpha-Chlordane	Red-winged blackbird	6.40E-02	2.14E+00	chronic	NOAEL	Mortality	Stickel et al. (1983) in [1]	1.0	1.0	2.14E+00
Anthracene	none	none	none	none	none	none	none	none	none	No TRV
Aroclor-1242	Screech owl	1.81E-01	4.10E-01	chronic	NOAEL	Reproduction	McLane and Hughes (1980) in [1]	1.0	1.0	4.10E-01
Aroclor-1248	none	none	none	none	none	none	none	none	none	No TRV
Aroclor-1254	Ring-necked pheasant	1.00E+00	1.80E+00	chronic	LOAEL	Reproduction	Dahlgren et al. (1972) in [1]	1.0	0.1	1.80E-01
Aroclor-1260	none	none	none	none	none	none	none	none	none	No TRV
Benzene	none	none	none	none	none	none	none	none	none	No TRV
Benzo(a)anthracene	none	none	none	none	none	none	none	none	none	No TRV
Benzo(a)pyrene	none	none	none	none	none	none	none	none	none	No TRV
Benzo(b)fluoranthene	none	none	none	none	none	none	none	none	none	No TRV
Benzo(g,h,i)perylene	none	none	none	none	none	none	none	none	none	No TRV
Benzo(k)fluoranthene	none	none	none	none	none	none	none	none	none	No TRV
Benzoic acid	none	none	none	none	none	none	none	none	none	No TRV
Benzyl alcohol	none	none	none	none	none	none	none	none	none	No TRV
Bis(2-chloroisopropyl)ether	none	none	none	none	none	none	none	none	none	No TRV
Bis(2-ethylhexyl)phthalate	Ringed dove	1.55E-01	1.10E+00	chronic	NOAEL	Reproduction	Peakall (1974) in [1]	1.0	1.0	1.10E+00
Butylbenzylphthalate	none	none	none	none	none	none	none	none	none	No TRV
Carbazole	none	none	none	none	none	none	none	none	none	No TRV
Carbon disulfide	none	none	none	none	none	none	none	none	none	No TRV
Chlordane	Red-winged blackbird	6.40E-02	2.14E+00	chronic	NOAEL	Mortality	Stickel et al. (1983) in [1]	1.0	1.0	2.14E+00
Chlorobenzene	none	none	none	none	none	none	none	none	none	No TRV
Chloroethane	none	none	none	none	none	none	none	none	none	No TRV
Chloroform	none	none	none	none	none	none	none	none	none	No TRV
Chrysene	none	none	none	none	none	none	none	none	none	No TRV
m,p-cresol	none	none	none	none	none	none	none	none	none	No TRV
Dalapon	none	none	none	none	none	none	none	none	none	No TRV
delta-BHC	none	none	none	none	none	none	none	none	none	No TRV
Dibenzo(a,h)anthracene	none	none	none	none	none	none	none	none	none	No TRV
Dibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
Dicamba	none	none	none	none	none	none	none	none	none	No TRV
Dichloroprop	none	none	none	none	none	none	none	none	none	No TRV
Dieldrin	Barn owl	4.66E-01	7.70E-02	chronic	NOAEL	Reproduction	Mendenhall et al. (1983) in [1]	1.0	1.0	7.70E-02
Diethylphthalate	none	none	none	none	none	none	none	none	none	No TRV
Di-n-butylphthalate	Ringed dove	1.55E-01	1.11E+00	chronic	LOAEL	Reproduction	Peakall (1974) in [1]	1.0	0.1	1.11E-01
Di-n-octylphthalate	none	none	none	none	none	none	none	none	none	No TRV
Endosulfan	Gray partridge	4.00E-01	1.00E+01	chronic	NOAEL	Reproduction	Abiola (1992) in [1]	1.0	1.0	1.00E+01
Endosulfan sulfate	none	none	none	none	none	none	none	none	none	No TRV

Appendix Table R-43. Derivation of No observed Adverse Effect Level (NOAEL) Toxicity Reference Values (TRVs) for Bird Test Species at Load Line 4, Ravenna, Ohio

Ecological constituent of potential concern	Test species	Test species body weight (kg) BW_t	Benchmark (mg/kgBW/d)	Test duration	Endpoint	Effect	Source	Duration conversion factor DCF	Endpoint conversion factor ECF	TRV (mg/kgBW/d) benchmark *x* DCF *x* ECF
Endrin	Mallard duck	1.15E+00	3.00E-01	chronic	NOAEL	Reproduction	Spann et al. (1986) in [1]	1.0	1.0	3.00E-01
Endrin ketone	none	none	none	none	none	none	none	none	none	No TRV
Ethylbenzene	none	none	none	none	none	none	none	none	none	No TRV
Fluoranthene	none	none	none	none	none	none	none	none	none	No TRV
Fluorene	none	none	none	none	none	none	none	none	none	No TRV
gamma-Chlordane	Red-winged blackbird	6.40E-02	2.14E+00	chronic	NOAEL	Mortality	Stickel et al. (1983) in [1]	1.0	1.0	2.14E+00
gamma-BHC (Lindane)	Mallard Duck	1.00E+00	2.00E+00	chronic	NOAEL	Reproduction	Chakravarty et al. (1986) in [1]	1.0	1.0	2.00E+00
Heptachlor	none	none	none	none	none	none	none	none	none	No TRV
Heptachlor epoxide	none	none	none	none	none	none	none	none	none	No TRV
Indeno(1,2,3-cd)pyrene	none	none	none	none	none	none	none	none	none	No TRV
MCPA	none	none	none	none	none	none	none	none	none	No TRV
MCPP	none	none	none	none	none	none	none	none	none	No TRV
Methyl bromide	none	none	none	none	none	none	none	none	none	No TRV
Methyl ethyl ketone	none	none	none	none	none	none	none	none	none	No TRV
Methyl mercury dicyandiamide	Mallard duck	1.00E+00	6.40E-02	chronic	LOAEL	Reproduction	Heinz (1979) in [1]	1.0	0.1	6.40E-03
Methylene chloride	none	none	none	none	none	none	none	none	none	No TRV
Methoxychlor	none	none	none	none	none	none	none	none	none	No TRV
Naphthalene	none	none	none	none	none	none	none	none	none	No TRV
N-Nitroso-di-N-propylamine	none	none	none	none	none	none	none	none	none	No TRV
N-Nitrosodiphenylamine	none	none	none	none	none	none	none	none	none	No TRV
Pentachlorophenol	none	none	none	none	none	none	none	none	none	No TRV
Phenanthrene	none	none	none	none	none	none	none	none	none	No TRV
Phenol	none	none	none	none	none	none	none	none	none	No TRV
Pyrene	none	none	none	none	none	none	none	none	none	No TRV
Styrene	none	none	none	none	none	none	none	none	none	No TRV
Tetrachloroethene	none	none	none	none	none	none	none	none	none	No TRV
Toluene	none	none	none	none	none	none	none	none	none	No TRV
Trichloroethene	none	none	none	none	none	none	none	none	none	No TRV
Vinyl chloride	none	none	none	none	none	none	none	none	none	No TRV
Xylenes, Total	none	none	none	none	none	none	none	none	none	No TRV
Dioxins and Furans										
1,2,3,4,6,7,8-Heptachlorodibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,4,7,8,9-Heptachlorodibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,4,7,8-Hexachlorodibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,6,7,8-Hexachlorodibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,7,8,9-Hexachlorodibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	none	none	none	none	none	none	none	none	none	No TRV

Appendix Table R-43. Derivation of No observed Adverse Effect Level (NOAEL) Toxicity Reference Values (TRVs) for Bird Test Species at Load Line 4, Ravenna, Ohio

Ecological constituent of potential concern	Test species	Test species body weight (kg) BW_t	Benchmark (mg/kgBW/d)	Test duration	Endpoint	Effect	Source	Duration conversion factor DCF	Endpoint conversion factor ECF	TRV (mg/kgBW/d) benchmark *x* DCF *x* ECF
1,2,3,7,8-Pentachlorodibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	none	none	none	none	none	none	none	none	none	No TRV
2,3,4,6,7,8-Hexachlorodibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
2,3,4,7,8-Pentachlorodibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
2,3,7,8-Tetrachlorodibenzofuran	Chick (1 day old)	1.21E-01	1.00E-04	subchronic	LOAEL	Mortality	McKinney et al. (1976) in [1]	0.1	0.1	1.00E-06
2,3,7,8-Tetrachlorodibenzo-p-dioxin	Ring-necked Pheasant	1.00E+00	1.40E-05	chronic	NOAEL	Reproduction	Nosek et al. (1992) in [1]	1.0	1.0	1.40E-05
Octachlorodibenzofuran	none	none	none	none	none	none	none	none	none	No TRV
Octachlorodibenzo-p-dioxin	none	none	none	none	none	none	none	none	none	No TRV
Explosives										
1,3,5-Trinitrobenzene	none	none	none	none	none	none	none	none	none	No TRV
1,3-Dinitrobenzene	none	none	none	none	none	none	none	none	none	No TRV
2,4,6-Trinitrotoluene	none	none	none	none	none	none	none	none	none	No TRV
2,4-Dinitrotoluene	none	none	none	none	none	none	none	none	none	No TRV
2,6-Dinitrotoluene	none	none	none	none	none	none	none	none	none	No TRV
2-Amino-4,6-dinitrotoluene	none	none	none	none	none	none	none	none	none	No TRV
4-Amino-2,6-dinitrotoluene	none	none	none	none	none	none	none	none	none	No TRV
Nitrobenzene	none	none	none	none	none	none	none	none	none	No TRV
Tetryl	none	none	none	none	none	none	none	none	none	No TRV

TRV = toxicity reference value
[1] = Sample et al. (1996)
DCF = Duration conversion factor; 1 if chronic, 0.1 if subchronic (Sample et al. 1996)
ECF = Endpoint conversion factor; 1 if NOAEL, 0.1 if LOAEL (Sample et al. 1996)
NOAEL = No observed adverse effect level
LOAEL = Lowest observed adverse effect level

Appendix Table R-44. NOAEL Toxicity Reference Values (TRVs) for Bird Receptors at Load Line 4, Ravenna, Ohio

Ecological constituent of potential concern	Test species	Test species body weight (kg)	TRV_t (mg/kgBW/d)	American Robin		Great Blue Heron		Mallard Duck		Red-tailed Hawk	
				Taxonomic conversion factor[a] CF_{tax}	TRV (mg/kgBW/d) $TRV_t x\ CF_{tax}$	Taxonomic conversion factor[a]	TRV (mg/kgBW/d) $TRV_t x\ CF_{tax}$	Taxonomic conversion factor[a]	TRV (mg/kgBW/d) $TRV_t x\ CF_{tax}$	Taxonomic conversion factor[a]	TRV (mg/kgBW/d) $TRV_t x\ CF_{tax}$
Metals											
Aluminum	Ringed dove	1.55E-01	1.10E+02	1.00E-02	1.10E+00	1.00E-02	1.10E+00	1.00E-02	1.10E+00	1.00E-02	1.10E+00
Ammonia	none	none	No TRV	none	none	none	none	none	none	none	none
Antimony	none	none	No TRV	none	none	none	none	none	none	none	none
Arsenic	Mallard duck	1.00E+00	5.14E+00	1.00E-02	5.14E-02	1.00E-02	5.14E-02	1.00E+00	5.14E+00	1.00E-02	5.14E-02
Arsenic (dissolved)	Mallard duck	1.00E+00	5.14E+00	1.00E-02	5.14E-02	1.00E-02	5.14E-02	1.00E+00	5.14E+00	1.00E-02	5.14E-02
Barium	Chick (14 day old)	1.21E-01	2.08E+01	1.00E-02	2.08E-01	1.00E-02	2.08E-01	1.00E-02	2.08E-01	1.00E-02	2.08E-01
Barium (dissolved)	Chick (14 day old)	1.21E-01	2.08E+01	1.00E-02	2.08E-01	1.00E-02	2.08E-01	1.00E-02	2.08E-01	1.00E-02	2.08E-01
Beryllium	none	none	No TRV	none	none	none	none	none	none	none	none
Beryllium (dissolved)	none	none	No TRV	none	none	none	none	none	none	none	none
Boron	Mallard duck	1.00E+00	2.88E+01	1.00E-02	2.88E-01	1.00E-02	2.88E-01	1.00E+00	2.88E+01	1.00E-02	2.88E-01
Cadmium	Mallard duck	1.15E+00	1.45E+00	1.00E-02	1.45E-02	1.00E-02	1.45E-02	1.00E+00	1.45E+00	1.00E-02	1.45E-02
Cadmium (dissolved)	Mallard duck	1.15E+00	1.45E+00	1.00E-02	1.45E-02	1.00E-02	1.45E-02	1.00E+00	1.45E+00	1.00E-02	1.45E-02
Calcium	none	none	No TRV	none	none	none	none	none	none	none	none
Chloride	none	none	No TRV	none	none	none	none	none	none	none	none
Chromium	Black duck	1.25E+00	1.00E+00	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E+00	1.00E+00	1.00E-02	1.00E-02
Chromium, hexavalent	none	none	No TRV	none	none	none	none	none	none	none	none
Cobalt	none	none	No TRV	none	none	none	none	none	none	none	none
Copper	Chick (5 week old)	5.34E-01	4.70E+01	1.00E-02	4.70E-01	1.00E-02	4.70E-01	1.00E-02	4.70E-01	1.00E-02	4.70E-01
Copper (dissolved)	Chick (5 week old)	5.34E-01	4.70E+01	1.00E-02	4.70E-01	1.00E-02	4.70E-01	1.00E-02	4.70E-01	1.00E-02	4.70E-01
Cyanide	none	none	No TRV	none	none	none	none	none	none	none	none
Fluoride	Screech Owl	1.81E-01	7.80E+00	1.00E-02	7.80E-02	1.00E-02	7.80E-02	1.00E-02	7.80E-02	1.00E-02	7.80E-02
Iron	none	none	No TRV	none	none	none	none	none	none	none	none
Lead	Quail	1.50E-01	1.13E+00	1.00E-02	1.13E-02	1.00E-02	1.13E-02	1.00E-02	1.13E-02	1.00E-02	1.13E-02
Lead (dissolved)	Quail	1.50E-01	1.13E+00	1.00E-02	1.13E-02	1.00E-02	1.13E-02	1.00E-02	1.13E-02	1.00E-02	1.13E-02
Magnesium	none	none	No TRV	none	none	none	none	none	none	none	none
Manganese	Quail	7.20E-02	9.77E+02	1.00E-02	9.77E+00	1.00E-02	9.77E+00	1.00E-02	9.77E+00	1.00E-02	9.77E+00
Mercury	Quail	1.50E-01	4.50E-01	1.00E-02	4.50E-03	1.00E-02	4.50E-03	1.00E-02	4.50E-03	1.00E-02	4.50E-03
Molybdenum	Chicken	1.50E+00	3.53E+00	1.00E-02	3.53E-02	1.00E-02	3.53E-02	1.00E-02	3.53E-02	1.00E-02	3.53E-02
Nickel	Mallard duckling	7.82E-01	7.74E+01	1.00E-02	7.74E-01	1.00E-02	7.74E-01	1.00E+00	7.74E+01	1.00E-02	7.74E-01
Nickel (dissolved)	Mallard duckling	7.82E-01	7.74E+01	1.00E-02	7.74E-01	1.00E-02	7.74E-01	1.00E+00	7.74E+01	1.00E-02	7.74E-01
Nitrate	none	none	No TRV	none	none	none	none	none	none	none	none
Phosphorus	none	none	No TRV	none	none	none	none	none	none	none	none
Potassium	none	none	No TRV	none	none	none	none	none	none	none	none
Selenium	Mallard duck	1.00E+00	5.00E-01	1.00E-02	5.00E-03	1.00E-02	5.00E-03	1.00E+00	5.00E-01	1.00E-02	5.00E-03
Silver	none	none	No TRV	none	none	none	none	none	none	none	none
Silicon	none	none	No TRV	none	none	none	none	none	none	none	none
Sodium	none	none	No TRV	none	none	none	none	none	none	none	none
Sulfate	none	none	No TRV	none	none	none	none	none	none	none	none
Thallium	none	none	No TRV	none	none	none	none	none	none	none	none
Vanadium	Mallard duck	1.17E+00	1.14E+01	1.00E-02	1.14E-01	1.00E-02	1.14E-01	1.00E+00	1.14E+01	1.00E-02	1.14E-01
Zinc	Leghorn chicken	1.94E+00	1.45E+01	1.00E-02	1.45E-01	1.00E-02	1.45E-01	1.00E-02	1.45E-01	1.00E-02	1.45E-01
Zinc (dissolved)	Leghorn chicken	1.94E+00	1.45E+01	1.00E-02	1.45E-01	1.00E-02	1.45E-01	1.00E-02	1.45E-01	1.00E-02	1.45E-01

Appendix Table R-44. NOAEL Toxicity Reference Values (TRVs) for Bird Receptors at Load Line 4, Ravenna, Ohio

Ecological constituent of potential concern	Test species	Test species body weight (kg)	TRV_t (mg/kgBW/d)	American Robin		Great Blue Heron		Mallard Duck		Red-tailed Hawk	
				Taxonomic conversion factor[a] CF_{tax}	TRV (mg/kgBW/d) $TRV_t x\ CF_{tax}$	Taxonomic conversion factor[a]	TRV (mg/kgBW/d) $TRV_t x\ CF_{tax}$	Taxonomic conversion factor[a]	TRV (mg/kgBW/d) $TRV_t x\ CF_{tax}$	Taxonomic conversion factor[a]	TRV (mg/kgBW/d) $TRV_t x\ CF_{tax}$
Organics											
1,1,1-Trichloroethane	none	none	No TRV	none	none	none	none	none	none	none	none
1,1,2,2-Tetrachloroethane	none	none	No TRV	none	none	none	none	none	none	none	none
1,1,2-Trichloroethane	none	none	No TRV	none	none	none	none	none	none	none	none
1,1-Dichloroethane	none	none	No TRV	none	none	none	none	none	none	none	none
1,1-Dichloroethene	none	none	No TRV	none	none	none	none	none	none	none	none
1,1-Dichloroethene	none	none	No TRV	none	none	none	none	none	none	none	none
1,1-Dichloroethene	none	none	No TRV	none	none	none	none	none	none	none	none
1,2,3,4,6,7,8-HpCDF	none	none	No TRV	none	none	none	none	none	none	none	none
1,2,4-trichlorobenzene	none	none	No TRV	none	none	none	none	none	none	none	none
1,2-cis-Dichloroethene	none	none	No TRV	none	none	none	none	none	none	none	none
1,2-Dichlorobenzene	none	none	No TRV	none	none	none	none	none	none	none	none
1,2-Dichloroethane	Chicken	1.60E+00	1.72E+01	1.00E-02	1.72E-01	1.00E-02	1.72E-01	1.00E-02	1.72E-01	1.00E-02	1.72E-01
1,2-Dichloroethane	none	none	No TRV	none	none	none	none	none	none	none	none
1,2-Dichloroethene	none	none	No TRV	none	none	none	none	none	none	none	none
1,2-Dichloroethene	none	none	No TRV	none	none	none	none	none	none	none	none
1,2-Dichloropropane	none	none	No TRV	none	none	none	none	none	none	none	none
1,2-trans-Dichloroethene	none	none	No TRV	none	none	none	none	none	none	none	none
1,3-Dichlorobenzene	none	none	No TRV	none	none	none	none	none	none	none	none
1,4-Dichlorobenzene	none	none	No TRV	none	none	none	none	none	none	none	none
2,2,5-Trimethylhexane	none	none	No TRV	none	none	none	none	none	none	none	none
2,4,5-trichlorophenol	none	none	No TRV	none	none	none	none	none	none	none	none
2,4-D	none	none	No TRV	none	none	none	none	none	none	none	none
2,4-Dimethylphenol	none	none	No TRV	none	none	none	none	none	none	none	none
2-Chlorophenol	none	none	No TRV	none	none	none	none	none	none	none	none
2-Hexanone	none	none	No TRV	none	none	none	none	none	none	none	none
2-Methylnaphthalene	none	none	No TRV	none	none	none	none	none	none	none	none
2-Methylnaphthalene	none	none	No TRV	none	none	none	none	none	none	none	none
2-Methylphenol	none	none	No TRV	none	none	none	none	none	none	none	none
4,4'-DDD	none	none	No TRV	none	none	none	none	none	none	none	none
4,4'-DDE	none	none	No TRV	none	none	none	none	none	none	none	none
4,4'-DDT	Brown pelican	3.50E+00	2.80E-03	1.00E-02	2.80E-05	1.00E-02	2.80E-05	1.00E-02	2.80E-05	1.00E-02	2.80E-05
4-Chloro-3-methylphenol	none	none	No TRV	none	none	none	none	none	none	none	none
4-Methyl-2-pentanone	none	none	No TRV	none	none	none	none	none	none	none	none
4-Methylphenol	none	none	No TRV	none	none	none	none	none	none	none	none
4-Methylphenol	none	none	No TRV	none	none	none	none	none	none	none	none
4-Nitrophenol	none	none	No TRV	none	none	none	none	none	none	none	none
Acenaphthene	none	none	No TRV	none	none	none	none	none	none	none	none
Acenaphthylene	none	none	No TRV	none	none	none	none	none	none	none	none
Acetone	none	none	No TRV	none	none	none	none	none	none	none	none
Alkalinity	none	none	No TRV	none	none	none	none	none	none	none	none
Aldrin	none	none	No TRV	none	none	none	none	none	none	none	none
alpha-Chlordane	Red-winged blackbi	6.40E-02	2.14E+00	3.30E-01	7.06E-01	1.00E-02	2.14E-02	1.00E-02	2.14E-02	1.00E-02	2.14E-02
Anthracene	none	none	No TRV	none	none	none	none	none	none	none	none
Aroclor-1242	Screech owl	1.81E-01	4.10E-01	1.00E-02	4.10E-03	1.00E-02	4.10E-03	1.00E-02	4.10E-03	1.00E-02	4.10E-03
Aroclor-1248	none	none	No TRV	none	none	none	none	none	none	none	none
Aroclor-1254	Ring-necked pheasa	1.00E+00	1.80E-01	1.00E-02	1.80E-03	1.00E-02	1.80E-03	1.00E-02	1.80E-03	1.00E-02	1.80E-03
Aroclor-1260	none	none	No TRV	none	none	none	none	none	none	none	none

Appendix Table R-44. NOAEL Toxicity Reference Values (TRVs) for Bird Receptors at Load Line 4, Ravenna, Ohio

Ecological constituent of potential concern	Test species	Test species body weight (kg)	TRV_t (mg/kgBW/d)	American Robin		Great Blue Heron		Mallard Duck		Red-tailed Hawk	
				Taxonomic conversion factor[a] CF_{tax}	TRV (mg/kgBW/d) $TRV_t x\ CF_{tax}$	Taxonomic conversion factor[a]	TRV (mg/kgBW/d) $TRV_t x\ CF_{tax}$	Taxonomic conversion factor[a]	TRV (mg/kgBW/d) $TRV_t x\ CF_{tax}$	Taxonomic conversion factor[a]	TRV (mg/kgBW/d) $TRV_t x\ CF_{tax}$
Benzene	none	none	No TRV	none	none	none	none	none	none	none	none
Benzo(a)anthracene	Chicken (embryo)	none	7.90E-03	1.00E-02	7.90E-05	1.00E-02	7.90E-05	1.00E-02	7.90E-05	1.00E-02	7.90E-05
Benzo(a)pyrene	Chicken (embryo)	none	1.00E+00	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02	1.00E-02
Benzo(b)fluoranthene	none	none	No TRV	none	none	none	none	none	none	none	none
Benzo(g,h,i)perylene	none	none	No TRV	none	none	none	none	none	none	none	none
Benzo(k)fluoranthene	Chicken (embryo)	none	1.40E-03	1.00E-02	1.40E-05	1.00E-02	1.40E-05	1.00E-02	1.40E-05	1.00E-02	1.40E-05
Benzoic acid	none	none	No TRV	none	none	none	none	none	none	none	none
Benzyl alcohol	none	none	No TRV	none	none	none	none	none	none	none	none
Bis(2-chloroisopropyl)ether	none	none	No TRV	none	none	none	none	none	none	none	none
Bis(2-ethylhexyl)phthalate	Ringed dove	1.55E-01	1.10E+00	1.00E-02	1.10E-02	1.00E-02	1.10E-02	1.00E-02	1.10E-02	1.00E-02	1.10E-02
Butylbenzylphthalate	none	none	No TRV	none	none	none	none	none	none	none	none
Carbazole	none	none	No TRV	none	none	none	none	none	none	none	none
Carbon disulfide	none	none	No TRV	none	none	none	none	none	none	none	none
Chlordane	Red-winged blackbi	6.40E-02	2.14E+00	3.30E-01	7.06E-01	1.00E-02	2.14E-02	1.00E-02	2.14E-02	1.00E-02	2.14E-02
Chlorobenzene	none	none	No TRV	none	none	none	none	none	none	none	none
Chloroethane	none	none	No TRV	none	none	none	none	none	none	none	none
Chloroform	none	none	No TRV	none	none	none	none	none	none	none	none
Chrysene	Chicken (embryo)	none	1.00E-01	1.00E-02	1.00E-03	1.00E-02	1.00E-03	1.00E-02	1.00E-03	1.00E-02	1.00E-03
m,p-cresol	none	none	No TRV	none	none	none	none	none	none	none	none
Dalapon	none	none	No TRV	none	none	none	none	none	none	none	none
delta-BHC	none	none	No TRV	none	none	none	none	none	none	none	none
Dibenzo(a,h)anthracene	Chicken (embryo)	none	3.90E-03	1.00E-02	3.90E-05	1.00E-02	3.90E-05	1.00E-02	3.90E-05	1.00E-02	3.90E-05
Dibenzofuran	none	none	No TRV	none	none	none	none	none	none	none	none
Dicamba	none	none	No TRV	none	none	none	none	none	none	none	none
Dichloroprop	none	none	No TRV	none	none	none	none	none	none	none	none
Dieldrin	Barn owl	4.66E-01	7.70E-02	1.00E-02	7.70E-04	1.00E-02	7.70E-04	1.00E-02	7.70E-04	1.00E-02	7.70E-04
Diethylphthalate	none	none	No TRV	none	none	none	none	none	none	none	none
Di-n-butylphthalate	Ringed dove	1.55E-01	1.11E-01	1.00E-02	1.11E-03	1.00E-02	1.11E-03	1.00E-02	1.11E-03	1.00E-02	1.11E-03
Di-n-octylphthalate	none	none	No TRV	none	none	none	none	none	none	none	none
Endosulfan	Gray partridge	4.00E-01	1.00E+01	1.00E-02	1.00E-01	1.00E-02	1.00E-01	1.00E-02	1.00E-01	1.00E-02	1.00E-01
Endosulfan sulfate	none	none	No TRV	none	none	none	none	none	none	none	none
Endrin	Mallard duck	1.15E+00	3.00E-01	1.00E-02	3.00E-03	1.00E-02	3.00E-03	1.00E+00	3.00E-01	1.00E-02	3.00E-03
Endrin ketone	none	none	No TRV	none	none	none	none	none	none	none	none
Ethylbenzene	none	none	No TRV	none	none	none	none	none	none	none	none
Fluoranthene	none	none	No TRV	none	none	none	none	none	none	none	none
Fluorene	none	none	No TRV	none	none	none	none	none	none	none	none
gamma-Chlordane	Red-winged blackbi	6.40E-02	2.14E+00	3.30E-01	7.06E-01	1.00E-02	2.14E-02	1.00E-02	2.14E-02	1.00E-02	2.14E-02
gamma-BHC (Lindane)	Mallard Duck	1.00E+00	2.00E+00	1.00E-02	2.00E-02	1.00E-02	2.00E-02	1.00E+00	2.00E+00	1.00E-02	2.00E-02
Heptachlor	none	none	No TRV	none	none	none	none	none	none	none	none
Heptachlor epoxide	none	none	No TRV	none	none	none	none	none	none	none	none
Indeno(1,2,3-cd)pyrene	Chicken (embryo)	none	1.00E-01	1.00E-02	1.00E-03	1.00E-02	1.00E-03	1.00E-02	1.00E-03	1.00E-02	1.00E-03
MCPA	none	none	No TRV	none	none	none	none	none	none	none	none
MCPP	none	none	No TRV	none	none	none	none	none	none	none	none
Methyl bromide	none	none	No TRV	none	none	none	none	none	none	none	none
Methyl ethyl ketone	none	none	No TRV	none	none	none	none	none	none	none	none
Methyl mercury dicyandiamide	Mallard duck	1.00E+00	6.40E-03	1.00E-02	6.40E-05	1.00E-02	6.40E-05	1.00E+00	6.40E-03	1.00E-02	6.40E-05
Methylene chloride	none	none	No TRV	none	none	none	none	none	none	none	none
Methoxychlor	none	none	No TRV	none	none	none	none	none	none	none	none

Appendix Table R-44. NOAEL Toxicity Reference Values (TRVs) for Bird Receptors at Load Line 4, Ravenna, Ohio

Ecological constituent of potential concern	Test species	Test species body weight (kg)	TRV_t (mg/kgBW/d)	American Robin		Great Blue Heron		Mallard Duck		Red-tailed Hawk	
				Taxonomic conversion factor[a] CF_{tax}	TRV (mg/kgBW/d) $TRV_t x\ CF_{tax}$	Taxonomic conversion factor[a]	TRV (mg/kgBW/d) $TRV_t x\ CF_{tax}$	Taxonomic conversion factor[a]	TRV (mg/kgBW/d) $TRV_t x\ CF_{tax}$	Taxonomic conversion factor[a]	TRV (mg/kgBW/d) $TRV_t x\ CF_{tax}$
Naphthalene	none	none	No TRV	none	none	none	none	none	none	none	none
N-Nitroso-di-N-propylamine	none	none	No TRV	none	none	none	none	none	none	none	none
N-Nitrosodiphenylamine	none	none	No TRV	none	none	none	none	none	none	none	none
Pentachlorophenol	none	none	No TRV	none	none	none	none	none	none	none	none
Phenanthrene	none	none	No TRV	none	none	none	none	none	none	none	none
Phenol	none	none	No TRV	none	none	none	none	none	none	none	none
Pyrene	none	none	No TRV	none	none	none	none	none	none	none	none
Styrene	none	none	No TRV	none	none	none	none	none	none	none	none
Tetrachloroethene	none	none	No TRV	none	none	none	none	none	none	none	none
Toluene	none	none	No TRV	none	none	none	none	none	none	none	none
Trichloroethene	none	none	No TRV	none	none	none	none	none	none	none	none
Vinyl chloride	none	none	No TRV	none	none	none	none	none	none	none	none
Xylenes, Total	none	none	No TRV	none	none	none	none	none	none	none	none
Dioxins and Furans											
1,2,3,4,6,7,8-Heptachlorodibenzofuran	none	none	No TRV	none	none	none	none	none	none	none	none
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	none	none	No TRV	none	none	none	none	none	none	none	none
1,2,3,4,7,8,9-Heptachlorodibenzofuran	none	none	No TRV	none	none	none	none	none	none	none	none
1,2,3,4,7,8-Hexachlorodibenzofuran	none	none	No TRV	none	none	none	none	none	none	none	none
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	none	none	No TRV	none	none	none	none	none	none	none	none
1,2,3,6,7,8-Hexachlorodibenzofuran	none	none	No TRV	none	none	none	none	none	none	none	none
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	none	none	No TRV	none	none	none	none	none	none	none	none
1,2,3,7,8,9-Hexachlorodibenzofuran	none	none	No TRV	none	none	none	none	none	none	none	none
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	none	none	No TRV	none	none	none	none	none	none	none	none
1,2,3,7,8-Pentachlorodibenzofuran	none	none	No TRV	none	none	none	none	none	none	none	none
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	none	none	No TRV	none	none	none	none	none	none	none	none
2,3,4,6,7,8-Hexachlorodibenzofuran	none	none	No TRV	none	none	none	none	none	none	none	none
2,3,4,7,8-Pentachlorodibenzofuran	none	none	No TRV	none	none	none	none	none	none	none	none
2,3,7,8-Tetrachlorodibenzofuran	Chick (1 day old)	1.21E-01	1.00E-06	1.00E-02	1.00E-08	1.00E-02	1.00E-08	1.00E-02	1.00E-08	1.00E-02	1.00E-08
2,3,7,8-Tetrachlorodibenzo-p-dioxin	Ring-necked Pheasa	1.00E+00	1.40E-05	1.00E-02	1.40E-07	1.00E-02	1.40E-07	1.00E-02	1.40E-07	1.00E-02	1.40E-07
Octachlorodibenzofuran	none	none	No TRV	none	none	none	none	none	none	none	none
Octachlorodibenzo-p-dioxin	none	none	No TRV	none	none	none	none	none	none	none	none
Explosives											
1,3,5-Trinitrobenzene	none	none	No TRV	none	none	none	none	none	none	none	none
1,3-Dinitrobenzene	none	none	No TRV	none	none	none	none	none	none	none	none
2,4,6-Trinitrotoluene	none	none	No TRV	none	none	none	none	none	none	none	none
2,4-Dinitrotoluene	none	none	No TRV	none	none	none	none	none	none	none	none
2,6-Dinitrotoluene	none	none	No TRV	none	none	none	none	none	none	none	none
2-Amino-4,6-dinitrotoluene	none	none	No TRV	none	none	none	none	none	none	none	none
4-Amino-2,6-dinitrotoluene	none	none	No TRV	none	none	none	none	none	none	none	none
Nitrobenzene	none	none	No TRV	none	none	none	none	none	none	none	none
Tetryl	none	none	No TRV	none	none	none	none	none	none	none	none

TRV = toxicity reference value

[a] Taxonomic adjustment factor for relatedness of test species and receptor (Ohio EPA 2003): 1 if same genus, 0.33 if same family, 0.1 if same order, 0.01 if same class

Appendix Table R-45. Toxicity Reference Values for Sediment Biota Exposed to COPECs at Load Line 4, Ravenna, Ohio

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	TRV (mg/kg)	
		Value	Source
Metals			
Aluminum	7429-90-5	none	No Source
Barium	7440-39-3	none	No Source
Beryllium	7440-41-7	none	No Source
Cadmium	7440-43-9	9.90E-01	MacDonald et al. (2000)
Calcium	7440-70-2	none	No Source
Iron	7439-89-6	none	No Source
Lead	7439-92-1	3.58E+01	MacDonald et al. (2000)
Magnesium	7439-95-4	none	No Source
Mercury	7487-94-6	1.80E-01	MacDonald et al. (2000)
Nickel	7440-02-0	2.27E+01	MacDonald et al. (2000)
Thallium	6533-73-9	none	No Source
Vanadium	7440-62-2	none	No Source
Pesticides/PCBs			
Aroclor 1248	12672-29-6	3.41E-01	EDQL EPA Region 5 (1998)[c]
Explosives			
2,4,6-Trinitrotoluene	118-96-7	none	No Source

COPEC = Constituents of potential ecological concern
ESV = ecological screening value
TRV = Toxicity reference value

Appendix Table R-46. Toxicity Reference Values for Aquatic Biota Exposed to COPECs at Load Line 4, Ravenna, Ohio

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	TRV (mg/L)	
		Value	Source
Metals			
Cadmium	7440-43-9	2.20E-03	Ohio Administrative Code Chapter 3745-1-07, Table 7-9, assuming a hardness of 100 mg/kg
Calcium	7440-43-9	1.16E+02	Lowest Chronic Value for daphnids, Suter and Tsao 1996
Iron	7439-89-6	1.00E+00	Chronic National Ambient Water Criterion, compiled in Suter and Tsao 1996
Magnesium	7439-95-4	8.20E+01	Lowest Chronic Value for daphnids, Suter and Tsao 1996
Manganese	7439-96-5	1.20E-01	Tier II Chronic Value, compiled in Suter and Tsao 1996
Mercury	7487-94-7	9.10E-03	Ohio Administrative Code Chapter 3745-1, Outside Mixing Zone Average
Potassium	7440-09-7	5.30E+01	Lowest Chronic Value for daphnids, Suter and Tsao 1996
Pesticides/PCBs			
4,4'-DDT	50-29-3	1.10E-08	Ohio Administrative Code Chapter 3745-1, Wildlife Outside Mixing Zone Average

COPEC = Constituents of potential ecological concern
ESV = ecological screening value
TRV = Toxicity reference value

Appendix Table R-47. Load Line 4 Explosives Handling Area Aggregate Hazard Quotients for Plants and Earthworms Exposed to Surface Soil COPECs at Ravenna, Ohio

		Plants			Earthworms		
COPECs remaining after the EU specific ESV screen	**Surface Soil RME Concentrations** (mg/kg)	**Plant TRV[a]** (mg/kg)	**Plant HQ Plant TRV/RME**	**COEC?**	**Earthworm TRV[b]** (mg/kg)	**Earthworm HQ Earthworm TRV/RME**	**COEC?**
Inorganics							
Aluminum	1.10E+04	5.00E+01	**2.19E+02**	**yes**	No TRV	No TRV	**yes**
Arsenic	9.49E+00	1.00E+01	9.49E-01	no	6.00E+01	1.58E-01	no
Barium	1.09E+02	5.00E+02	2.18E-01	no	No TRV	No TRV	**yes**
Beryllium	1.22E+00	1.00E+01	1.22E-01	no	No TRV	No TRV	**yes**
Cadmium	1.1E+00	4.00E+00	2.87E-01	no	2.00E+01	5.73E-02	no
Calcium	2.81E+04	No TRV	No TRV	**yes**	No TRV	No TRV	**yes**
Chromium	1.50E+01	1.00E+00	**1.50E+01**	**yes**	4.00E-01	**3.75E+01**	**yes**
Copper	2.48E+01	1.00E+02	2.48E-01	no	6.00E+01	4.14E-01	no
Iron	2.04E+04	1.00E+01	**2.04E+03**	**yes**	No TRV	No TRV	**yes**
Lead	2.75E+02	5.00E+01	**5.51E+00**	**yes**	5.00E+02	5.51E-01	no
Magnesium	6.76E+03	No TRV	No TRV	**yes**	No TRV	No TRV	**yes**
Mercury	4.60E-02	3.00E-01	1.53E-01	no	1.00E-01	4.60E-01	no
Selenium	1.13E+00	1.00E+00	**1.13E+00**	**yes**	7.00E+01	1.61E-02	no
Sodium	3.44E+02	No TRV	**No TRV**	**yes**	No TRV	No TRV	**yes**
Thallium	1.45E+00	1.00E+00	**1.45E+00**	**yes**	No TRV	No TRV	**yes**
Zinc	2.60E+02	5.00E+01	**5.21E+00**	**yes**	2.00E+02	**1.30E+00**	**yes**
Pesticides and PCBs							
Aroclor-1254	5.46E-01	4.00E+01	1.36E-02	no	No TRV	No TRV	**yes**
4,4'-DDT	7.35E-02	No TRV	No TRV	**yes**	No TRV	No TRV	**yes**
Dieldrin	1.51E-02	No TRV	No TRV	**yes**	No TRV	No TRV	**yes**

COPEC = chemical of potential ecological concern
EU = exposure unit
ESV = ecological screening value
RME = Reasonable maximum exposure
[a]Plant TRV reference from Efroymson et al. (1997a)
TRV = toxicity reference value
HQ = Hazard quotient
COEC = chemical of potential ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1
[b]Earthworm TRV reference from Efroymson et al. (1997b)
HQs in **bold font** are > 1

Appendix Table R-48. Load Line 4 Explosives Handling Area Aggregate Hazard Quotients for Cottontail Rabbits Exposed to Surface Soil COPECs at Ravanna, Ohio

COPECs following ESV screen	RME Concentration (mg/kg)	SP_v	ADD_P (mg/kgBW/d) RME x SP_v x CF x I_P x AUF	BAF_i	ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_A x AUF	ADD_S (mg/kgBW/d) RME x I_S x AUF	ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	NOAEL TRV (mg/kgBW/d)	HQ ADD_{total} / TRV	COEC?
Inorganics										
Aluminum	1.10E+04	4.00E-03	1.24E+00	2.20E-01	0.00E+00	1.38E+02	1.39E+02	7.64E-01	**1.82E+02**	**yes**
Arsenic	9.49E+00	4.00E-02	1.07E-02	2.58E-01	0.00E+00	1.20E-01	1.30E-01	4.99E-02	**2.61E+00**	**yes**
Barium	1.09E+02	1.50E-01	4.60E-01	2.20E-01	0.00E+00	1.37E+00	1.83E+00	3.91E+00	4.68E-01	no
Beryllium	1.22E+00	1.00E-02	3.43E-04	2.20E-01	0.00E+00	1.53E-02	1.57E-02	4.83E-01	3.25E-02	no
Cadmium	1.1E+00	5.50E-01	1.78E-02	1.71E+01	0.00E+00	1.44E-02	3.22E-02	7.06E-01	4.56E-02	no
Calcium	2.81E+04	3.50E+00	2.78E+03	3.21E-01	0.00E+00	3.55E+02	3.13E+03	No TRV	No TRV	**yes**
Chromium	1.50E+01	7.50E-03	3.17E-03	1.10E+00	0.00E+00	1.89E-01	1.92E-01	2.00E+03	9.58E-05	no
Copper	2.48E+01	4.00E-01	2.80E-01	4.00E-02	0.00E+00	3.13E-01	5.92E-01	1.11E+01	5.32E-02	no
Iron	2.04E+04	4.00E-03	2.30E+00	3.21E-01	0.00E+00	2.57E+02	2.59E+02	No TRV	No TRV	**yes**
Lead	2.75E+02	4.50E-02	3.49E-01	3.34E+00	0.00E+00	3.47E+00	3.82E+00	5.85E+00	6.52E-01	no
Magnesium	6.76E+03	1.00E+00	1.91E+02	3.21E-01	0.00E+00	8.52E+01	2.76E+02	No TRV	No TRV	**yes**
Mercury	4.60E-02	9.00E-01	1.17E-03	5.23E+00	0.00E+00	5.79E-04	1.75E-03	9.61E-01	1.82E-03	no
Selenium	1.13E+00	2.50E-02	7.94E-04	2.20E-01	0.00E+00	1.42E-02	1.50E-02	1.46E-01	1.02E-01	no
Sodium	3.44E+02	7.50E-02	7.27E-01	3.21E-01	0.00E+00	4.33E+00	5.06E+00	No TRV	No TRV	**yes**
Thallium	1.45E+00	4.00E-03	1.64E-04	2.20E-01	0.00E+00	1.83E-02	1.85E-02	5.47E-03	**3.38E+00**	**yes**
Zinc	2.60E+02	1.50E+00	1.10E+01	5.77E+00	0.00E+00	3.28E+00	1.43E+01	1.17E+02	1.22E-01	no
Pesticides and PCBs										
Aroclor-1254	5.46E-01	8.96E-03	1.38E-04	8.91E+00	0.00E+00	6.88E-03	7.02E-03	2.23E-02	3.15E-01	no
4,4'-DDT	7.35E-02	1.20E-02	2.49E-05	1.26E+00	0.00E+00	9.26E-04	9.51E-04	5.85E-01	1.62E-03	no
Dieldrin	1.51E-02	3.49E-02	1.48E-05	3.54E-04	0.00E+00	1.90E-04	2.05E-04	1.46E-02	1.40E-02	no

COPEC = Constituents of potential ecological concern
ESV = ecological screening value
CF = correction factor dry wt to wet wt[(0.15) 0.15 kd dry plant/kg wet plant]
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
SP_v = Soil-to-plant uptake factor; vegetative
ADD_P = Average daily dose; plant
I_P (kg/kgBW/d) = Plant ingestion rate for cottontails = 1.88E-01
AUF = Area use factor (1.0)
BAF_i = Soil-to-animal; invertebrates
ADD_A = Average daily dose; animal
CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]
I_A (kg/kgBW/d) = Animal ingestion rate for cottontails = 0.00E+00
ADD_S = Average daily dose; soil
I_S (kg/kgBW/d) = Soil ingestion rate for cottontails = 1.26E-02
ADDtotal = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1
HQs in **bold font** are > 1

Appendix Table R-49. Load Line 4 Explosives Handling Area Aggregate Hazard Quotients for Shrews Exposed to Surface Soil COPECs at Ravanna, Ohio

COPECs following ESV screen	RME Concentration (mg/kg)	SP_v	ADD_P (mg/kgBW/d) RME x SP_v x CF x I_P x AUF	BAF_i	ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_A x AUF	ADD_S (mg/kgBW/d) RME x I_S x AUF	ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	NOAEL TRV (mg/kgBW/d)	HQ ADD_{total} / TRV	COEC?
Inorganics										
Aluminum	1.10E+04	4.00E-03	4.79E-01	2.20E-01	1.18E+03	3.69E+02	1.54E+03	2.22E+00	**6.94E+02**	**yes**
Arsenic	9.49E+00	4.00E-02	4.14E-03	2.58E-01	1.55E-01	3.19E-01	4.78E-01	1.45E-01	**3.29E+00**	**yes**
Barium	1.09E+02	1.50E-01	1.78E-01	2.20E-01	1.17E+01	3.66E+00	1.55E+01	1.14E+01	**1.36E+00**	**yes**
Beryllium	1.22E+00	1.00E-02	1.33E-04	2.20E-01	1.31E-01	4.09E-02	1.72E-01	1.41E+00	1.22E-01	no
Cadmium	1.1E+00	5.50E-01	6.88E-03	1.71E+01	1.24E+00	3.85E-02	1.29E+00	2.05E+00	6.26E-01	no
Calcium	2.81E+04	3.50E+00	1.08E+03	3.21E-01	4.40E+03	9.46E+02	6.42E+03	No TRV	**No TRV**	**yes**
Chromium	1.50E+01	7.50E-03	1.23E-03	1.10E+00	1.04E+00	5.03E-01	1.55E+00	5.83E+03	2.65E-04	no
Copper	2.48E+01	4.00E-01	1.08E-01	4.00E-02	6.29E-02	8.34E-01	1.00E+00	3.24E+01	3.10E-02	no
Iron	2.04E+04	4.00E-03	8.90E-01	3.21E-01	3.19E+03	6.85E+02	3.87E+03	No TRV	No TRV	**yes**
Lead	2.75E+02	4.50E-02	1.35E-01	3.34E+00	5.83E+01	9.25E+00	6.77E+01	1.70E+01	**3.97E+00**	**yes**
Magnesium	6.76E+03	1.00E+00	7.39E+01	3.21E-01	1.06E+03	2.27E+02	1.36E+03	No TRV	No TRV	**yes**
Mercury	4.60E-02	9.00E-01	4.52E-04	5.23E+00	1.52E-02	1.54E-03	1.72E-02	2.80E+00	6.16E-03	no
Selenium	1.13E+00	2.50E-02	3.07E-04	2.20E-01	1.57E-02	3.78E-02	5.38E-02	4.26E-01	1.26E-01	no
Sodium	3.44E+02	7.50E-02	2.82E-01	3.21E-01	5.38E+01	1.16E+01	6.56E+01	No TRV	No TRV	**yes**
Thallium	1.45E+00	4.00E-03	6.35E-05	2.20E-01	1.56E-01	4.89E-02	2.05E-01	1.59E-02	**1.29E+01**	**yes**
Zinc	2.60E+02	1.50E+00	4.27E+00	5.77E+00	9.51E+01	8.75E+00	1.08E+02	3.41E+02	3.17E-01	no
Pesticides and PCBs										
Aroclor-1254	5.46E-01	8.96E-03	5.34E-05	8.91E+00	3.08E-01	1.83E-02	3.26E-01	6.48E-02	**5.04E+00**	**yes**
4,4'-DDT	7.35E-02	1.20E-02	9.63E-06	1.26E+00	4.51E-02	2.47E-03	4.76E-02	1.70E+00	2.79E-02	no
Dieldrin	1.51E-02	3.49E-02	5.73E-06	3.54E-04	2.60E-06	5.06E-04	5.14E-04	4.26E-02	1.21E-02	no

COPEC = Constituents of potential ecological concern
ESV = ecological screening value
CF = correction factor dry wt to wet wt[(0.15) 0.15 kd dry plant/kg wet plant]
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
SP_v = Soil-to-plant uptake factor; vegetative
ADD_P = Average daily dose; plant
I_P (kg/kgBW/d) = Plant ingestion rate for shrews = 7.28E-02
AUF = Area use factor (1.0)
BAF_i = Soil-to-animal; invertebrates
ADD_A = Average daily dose; animal
CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]
I_A (kg/kgBW/d) = Animal ingestion rate for shrews = 4.87E-01
ADD_S = Average daily dose; soil
I_S (kg/kgBW/d) = Soil ingestion rate for shrews = 3.66E-02
ADDtotal = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1
HQs in **bold font** are >1

Appendix Table R-50. Load Line 4 Explosives Handling Area Aggregate Hazard Quotients for Red Foxes Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after ESV screen	RME Concentration (mg/kg)	SP_r	ADD_P (mg/kgBW/d) RME x SP_r x CF_r x I_P x AUF_{-F}	SP_v	Prey ADD_P (mg/kgBW/d) RME x SP_v x CFv x I_{P-s} x AUF-s	BAF_i	Prey ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_{A-s} x AUF-s	Prey ADD_S (mg/kgBW/d) RME x I_{S-s} x AUF-s	Prey ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$
Inorganics									
Cadmium	1.15E+00	1.50E-01	6.20E-07	5.50E-01	6.88E-03	1.71E+01	1.24E+00	3.85E-02	1.29E+00
Lead	2.75E+02	9.00E-03	8.93E-06	4.50E-02	1.35E-01	3.34E+00	5.83E+01	9.25E+00	6.77E+01
Mercury	4.60E-02	2.00E-01	3.31E-08	9.00E-01	4.52E-04	5.23E+00	1.52E-02	1.54E-03	1.72E-02
Zinc	2.60E+02	9.00E-01	8.45E-04	#######	4.27E+00	5.77E+00	9.51E+01	8.75E+00	1.08E+02
Pesticides/PCBs									
4,4'-DDT	7.35E-02	1.20E-02	3.18E-09	1.20E-02	9.63E-06	1.26E+00	4.51E-02	2.47E-03	4.76E-02
Dieldrin	1.51E-02	3.49E-02	1.89E-09	3.49E-02	5.73E-06	3.54E-04	2.60E-06	5.06E-04	5.14E-04
Aroclor-1254	5.46E-01	8.96E-03	1.76E-08	8.96E-03	5.34E-05	8.91E+00	3.08E-01	1.83E-02	3.26E-01

PBT = persistent, bioaccumulative, and toxic
RME = Reasonable maximum exposure
SP_r = Soil-to-plant; reproductive
SP_v = Soil-to-plant; vegetative
I_P (kg/kgBW/d) = Plant ingestion rate for red foxes = 0.00437
ADD_P = Average daily dose; plant
I_{P-s} (kg/kgBW/d) = Plant ingestion rate for shrews = 0.0728
AUF_{-F} = Area use factor for fox = 8.25E-03
AUF_s = Area use factor for shrew = 1.0
BAF_i = Soil-to-animal; invertebrates
ADD_A = Average daily dose; animal
I_{A-s} (kg/kgBW/d) = Animal ingestion rate for shrews = 0.487
ADD_S = Average daily dose; soil
I_{S-s} (kg/kgBW/d) = Soil ingestion rate for shrews = 0.0336
Cs (mg/kg) = Concentration in the prey
IR_f = Ingestion rate of food for shrews

CF_r = correction factor [0.10) 0.10 kg dry wt reproductive plant part/kg wet wt]
CF_v = correction factor [0.15) 0.15 kg dry wt vegetative plant part/kg wet wt]
CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]
COPEC = chemical of potential ecological concern
I_A (kg/kgBW/d) = Animal ingestion rate for red foxes = 0.0906
BAF_{-TP} = Animal-to-mammal transfer factor (Ba_{cow} x $BW_{receptor}$ x lipid ratio) where lipid ratio = 1 for inorganics, 0.8 for organics; mammal Ba = biotransfer food to cow, and $BW_{receptor}$ = body wt (kg) of the receptor
I_S (kg/kgBW/d) = Soil ingestion rate for red foxes = 0.00266
ADD_{total} = Average daily dose; total
TRV (mg/kgBW/d) = toxicity reference value
HQ = Hazard quotient
COEC = contaminant of ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1
HQs in **bold font** are >1

Appendix Table R-50. Load Line 4 Explosives Handling Area Aggregate Hazard Quotients for Red Foxes Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after ESV screen	**Cs** (mg/kg) Prey ADD_{total}/IR_f	**BAF_{-TP}**	**ADD_A** (mg/kgBW/d) $Cs \times BAF_{-TP} \times I_A \times AUF_{-F}$	**ADD_S** (mg/kgBW/d) $RME \times I_S \times AUF_{-F}$	**ADD_{total}** (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	**NOAEL TRV** (mg/kgBW/d)	**Site HQ** ADD_{total} / TRV	**COEC?**
Inorganics								
Cadmium	2.30E+00	1.54E-02	2.65E-05	2.51E-05	5.23E-05	5.08E-01	1.03E-04	no
Lead	1.21E+02	1.36E-03	1.23E-04	6.04E-03	6.17E-03	4.22E+00	1.46E-03	no
Mercury	3.08E-02	2.36E-02	5.43E-07	1.01E-06	1.58E-06	6.92E-01	2.29E-06	no
Zinc	1.93E+02	4.54E-01	6.55E-02	5.71E-03	7.20E-02	8.43E+01	8.54E-04	no
Pesticides/PCBs								
4,4'-DDT	8.50E-02	1.34E-01	8.50E-06	1.61E-06	1.01E-05	4.22E-01	2.40E-05	no
Dieldrin	9.18E-04	2.12E-02	1.45E-08	3.30E-07	3.47E-07	1.05E-02	3.29E-05	no
Aroclor-1254	5.83E-01	2.22E-01	9.68E-05	1.20E-05	1.09E-04	1.60E-02	6.79E-03	no

Appendix Table R-51. Load Line 4 Explosive Handling Area Aggregate Hazard Quotients for Red-Tailed Hawks Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after the ESV Screen	RME Concentration (mg/kg)	SP_v	ADD_P (mg/kgBW/d) RME x SP_v x CFv x I_P x AUF_{-H}	Prey ADD_P (mg/kgBW/d) RME x SP_v x CFv x I_{P-S} x AUF-s	BAF_i	Prey ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_{A-S} x AUF-s	Prey ADD_S (mg/kgBW/d) RME x I_{S-S} x AUF-s	Prey ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$
Inorganics								
Cadmium	1.15E+00	5.50E-01	0.00E+00	6.88E-03	1.71E+01	1.24E+00	3.85E-02	1.29E+00
Lead	2.75E+02	4.50E-02	0.00E+00	1.35E-01	3.34E+00	5.83E+01	9.25E+00	6.77E+01
Mercury	4.60E-02	9.00E-01	0.00E+00	4.52E-04	5.23E+00	1.52E-02	1.54E-03	1.72E-02
Zinc	2.60E+02	1.50E+00	0.00E+00	4.27E+00	5.77E+00	9.51E+01	8.75E+00	1.08E+02
Pesticides/PCBs								
4,4'-DDT	7.35E-02	1.20E-02	0.00E+00	9.63E-06	1.26E+00	4.51E-02	2.47E-03	4.76E-02
Dieldrin	1.51E-02	3.49E-02	0.00E+00	5.73E-06	3.54E-04	2.60E-06	5.06E-04	5.14E-04
Aroclor-1254	5.46E-01	8.96E-03	0.00E+00	5.34E-05	8.91E+00	3.08E-01	1.83E-02	3.26E-01

PBT = persistent, bioaccumulative, and toxic
COPEC = contaminant of potential ecological concern
ESV = ecological screening value
RME = reasonable maximum concenetration
SP_r = Soil-to-plant; reproductive
SP_v = Soil-to-plant; vegetative
I_P (kg/kgBW/d) = Plant ingestion rate for red-tailed hawks = 0.00
ADD_P = Average daily dose; plant
CF_v = correction factor [0.15) 0.15 kg dry wt vegetative plant part/kg wet wt]
CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]
Cs (mg/kg) = Concentration in the prey
IR_f (kg/kgBW/d)= Ingestion rate of food for shrews = 0.56
BAF_{-TP} = Animal-to-mammal transfer factor (Ba_{cow} x $BW_{receptor}$ x lipid ratio) where lipid ratio = 1 for inorganics, 0.8 for organics; mammal Ba = biotransfer food to cow, and $BW_{receptor}$ = body wt (kg) of the receptor
I_A (kg/kgBW/d) = Animal ingestion rate for red-tailed hawks = 0.11
I_S (kg/kgBW/d) = Soil ingestion rate for red-tailed hawks = 0.00

Appendix Table R-51. Load Line 4 Explosive Handling Area Aggregate Hazard Quotients for Red-Tailed Hawks Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after the ESV Screen	**Cs** (mg/kg) ADD_{total}/IR_f	**BAF_{-TP}**	**ADD_A** (mg/kgBW/d) $Cs\ x\ BAF_{-TP} x\ I_A x\ AUF_{-H}$	**ADD_S** (mg/kgBW/d) $RME\ x\ I_S x\ AUF_{-H}$	**ADD_{total}** (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	**NOAEL TRV** (mg/kgBW/d)	**Site HQ** ADD_{total} / TRV	**COEC?**
Inorganics								
Cadmium	2.30E+00	3.86E-03	4.63E-06	0.00E+00	4.63E-06	1.45E-02	3.19E-04	no
Lead	1.21E+02	3.40E-04	2.15E-05	0.00E+00	2.15E-05	1.13E-02	1.90E-03	no
Mercury	3.08E-02	5.90E-03	9.48E-08	0.00E+00	9.48E-08	4.50E-03	2.11E-05	no
Zinc	1.93E+02	1.13E-01	1.14E-02	0.00E+00	1.14E-02	1.45E-01	7.89E-02	no
Pesticides/PCBs								
4,4'-DDT	8.50E-02	2.68E-02	1.19E-06	0.00E+00	1.19E-06	2.80E-05	4.24E-02	no
Dieldrin	9.18E-04	4.24E-03	2.03E-09	0.00E+00	2.03E-09	7.70E-04	2.64E-06	no
Aroclor-1254	5.83E-01	4.44E-02	1.35E-05	0.00E+00	1.35E-05	1.80E-03	7.51E-03	no

I_{P-s} (kg/kgBW/d) = Plant ingestion rate for shrews (7.28E-02)
AUF_s = Area use factor for shrew (1.0)
BAF_i = Soil-to-animal; invertebrates
ADD_A = Average daily dose; animal
I_{A-s} (kg/kgBW/d) = Animal ingestion rate for shrews (4.87E-01)
ADD_S = Average daily dose; soil
AUF_{-H} = Area use factor hawk 4.75E-03

I_{S-s} (kg/kgBW/d) = Soil ingestion rate for shrews (3.36E-02)
ADD_{total} = Average daily dose; total
TRV (mg/kgBW/d) = toxicity reference value
HQ = Hazard quotient
COEC = contaminant of ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1
HQs in **bold font** are > 1

Appendix Table R-52. Load Line 4 Preparation and Receiving Area Aggregate Hazard Quotients for Plants and Earthworms Exposed to Surface Soil COPECs at Ravenna, Ohio

COPECs remaining after the EU specific ESV screen	Surface Soil RME Concentrations (mg/kg)	Plants			Earthworms		
		Plant TRV[a] (mg/kg)	Plant HQ Plant TRV/RME	COEC?	Earthworm TRV[b] (mg/kg)	Earthworm HQ Earthworm TRV/RME	COEC?
Inorganics							
Arsenic	1.40E+01	1.00E+01	**1.40E+00**	**yes**	6.00E+01	2.34E-01	no
Cadmium	2.36E+00	4.00E+00	5.90E-01	no	2.00E+01	1.18E-01	no
Chromium	3.53E+01	1.00E+00	**3.53E+01**	**yes**	4.00E-01	**8.83E+01**	**yes**
Iron	3.14E+04	1.00E+01	**3.14E+03**	**yes**	No TRV	No TRV	**yes**
Lead	3.85E+02	5.00E+01	**7.70E+00**	**yes**	5.00E+02	7.70E-01	no
Nickel	2.07E+01	3.00E+01	6.91E-01	no	2.00E+02	1.04E-01	no
Zinc	3.39E+02	5.00E+01	**6.78E+00**	**yes**	2.00E+02	**1.70E+00**	**yes**
Pesticides and PCBs							
Aroclor-1254	7.84E+00	4.00E+01	1.96E-01	no	No TRV	No TRV	**yes**

COPEC = chemical of potential ecological concern
EU = exposure unit
ESV = ecological screening value
RME = Reasonable maximum exposure
[a]Plant TRV reference from Efroymson et al. (1997a)
TRV = toxicity reference value
HQ = Hazard quotient

COEC = chemical of potential ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1
[b]Earthworm TRV reference from Efroymson et al. (1997b)
HQs in **bold font** are > 1

Appendix Table R-53. Load Line 4 Preparation and Receiving Area Aggregate Hazard Quotients for Cottontail Rabbits Exposed to Surface Soil COPECs at Ravanna, Ohio

COPECs following ESV screen	RME Concentration (mg/kg)	SP_v	ADD_P (mg/kgBW/d) RME x SP_v x CF x I_P x AUF	BAF_i	ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_A x AUF	ADD_S (mg/kgBW/d) RME x I_S x AUF	ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	NOAEL TRV (mg/kgBW/d)	HQ ADD_{total} / TRV	COEC?
Inorganics										
Arsenic	1.40E+01	4.00E-02	1.16E-02	2.58E-01	0.00E+00	1.29E-01	1.41E-01	4.99E-02	**2.82E+00**	**yes**
Cadmium	2.36E+00	5.50E-01	2.68E-02	1.71E+01	0.00E+00	2.17E-02	4.85E-02	7.06E-01	6.87E-02	no
Chromium	3.53E+01	7.50E-03	5.47E-03	1.10E+00	0.00E+00	3.26E-01	3.31E-01	2.00E+03	1.65E-04	no
Iron	3.14E+04	4.00E-03	2.59E+00	3.21E-01	0.00E+00	2.90E+02	2.92E+02	No TRV	No TRV	**yes**
Lead	3.85E+02	4.50E-02	3.58E-01	3.34E+00	0.00E+00	3.55E+00	3.91E+00	5.85E+00	6.68E-01	no
Nickel	2.07E+01	6.00E-02	2.57E-02	1.66E+00	0.00E+00	1.91E-01	2.17E-01	2.93E+01	7.41E-03	no
Zinc	3.39E+02	1.50E+00	1.05E+01	5.77E+00	0.00E+00	3.13E+00	1.36E+01	1.17E+02	1.16E-01	no
Pesticides and PCBs										
Aroclor-1254	7.84E+00	8.96E-03	1.45E-03	8.91E+00	0.00E+00	7.23E-02	7.38E-02	2.23E-02	**3.31E+00**	**yes**

COPEC = Constituents of potential ecological concern
ESV = ecological screening value
CF = correction factor dry wt to wet wt[(0.15) 0.15 kd dry plant/kg wet plant]
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
SP_v = Soil-to-plant uptake factor; vegetative
ADD_P = Average daily dose; plant
I_P (kg/kgBW/d) = Plant ingestion rate for cottontails = 1.88E-01
AUF = Area use factor = 7.32E-01
BAF_i = Soil-to-animal; invertebrates
ADD_A = Average daily dose; animal
CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]
I_A (kg/kgBW/d) = Animal ingestion rate for cottontails = 0.00E+00
ADD_S = Average daily dose; soil
I_S (kg/kgBW/d) = Soil ingestion rate for cottontails = 1.26E-02
ADDtotal = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1
HQs in **bold font** are > 1

Appendix Table R-54. Load Line 4 Preparation and Receiving Area Aggregate Hazard Quotients for Shrews Exposed to Surface Soil COPECs at Ravanna, Ohio

COPECs following ESV screen	RME Concentration (mg/kg)	SP_v	ADD_P (mg/kgBW/d) RME x SP_v x CF x I_P x AUF	BAF_i	ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_A x AUF	ADD_S (mg/kgBW/d) RME x I_S x AUF	ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	NOAEL TRV (mg/kgBW/d)	HQ ADD_{total} / TRV	COEC?
Inorganics										
Arsenic	1.40E+01	4.00E-02	6.12E-03	2.58E-01	2.29E-01	4.71E-01	7.06E-01	1.45E-01	**4.86E+00**	**yes**
Cadmium	2.36E+00	5.50E-01	1.42E-02	1.71E+01	2.55E+00	7.92E-02	2.65E+00	2.05E+00	**1.29E+00**	**yes**
Chromium	3.53E+01	7.50E-03	2.89E-03	1.10E+00	2.46E+00	1.19E+00	3.65E+00	5.83E+03	6.25E-04	no
Iron	3.14E+04	4.00E-03	1.37E+00	3.21E-01	4.91E+03	1.05E+03	5.97E+03	No TRV	No TRV	**yes**
Lead	3.85E+02	4.50E-02	1.89E-01	3.34E+00	8.15E+01	1.29E+01	9.46E+01	1.70E+01	**5.55E+00**	**yes**
Nickel	2.07E+01	6.00E-02	1.36E-02	1.66E+00	2.18E+00	6.97E-01	2.89E+00	8.52E+01	3.39E-02	no
Zinc	3.39E+02	1.50E+00	5.56E+00	5.77E+00	1.24E+02	1.14E+01	1.41E+02	3.41E+02	4.13E-01	no
Pesticides and PCBs										
Aroclor-1254	7.84E+00	8.96E-03	7.67E-04	8.91E+00	4.42E+00	2.63E-01	4.69E+00	6.48E-02	**7.24E+01**	**yes**

COPEC = Constituents of potential ecological concern
ESV = ecological screening value
CF = correction factor dry wt to wet wt[(0.15) 0.15 kd dry plant/kg wet plant]
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
SP_v = Soil-to-plant uptake factor; vegetative
ADD_P = Average daily dose; plant
I_P (kg/kgBW/d) = Plant ingestion rate for shrews = 7.28E-02
AUF = Area use factor (1.0)
BAF_i = Soil-to-animal; invertebrates
ADD_A = Average daily dose; animal
CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]
I_A (kg/kgBW/d) = Animal ingestion rate for shrews = 4.87E-01
ADD_S = Average daily dose; soil
I_S (kg/kgBW/d) = Soil ingestion rate for shrews = 3.66E-02
ADDtotal = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1
HQs in **bold font** are >1

Appendix Table R-55. Load Line 4 Preparation and Receiving Area Aggregate Hazard Quotients for Red Foxes Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after ESV screen	RME Concentration (mg/kg)	SP_r	ADD_P (mg/kgBW/d) RME x SP_r x CF_r x I_P x AUF_{-F}	SP_v	Prey ADD_P (mg/kgBW/d) RME x SP_v x CFv x I_{P-S} x AUF-s	BAF_i	Prey ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_{A-S} x AUF-s	Prey ADD_S (mg/kgBW/d) RME x I_{S-S} x AUF-s	Prey ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$
Inorganics									
Cadmium	2.36E+00	1.50E-01	6.96E-07	5.50E-01	1.42E-02	1.71E+01	2.55E+00	7.92E-02	2.65E+00
Lead	3.85E+02	9.00E-03	6.82E-06	4.50E-02	1.89E-01	3.34E+00	8.15E+01	1.29E+01	9.46E+01
Zinc	3.39E+02	9.00E-01	6.01E-04	#######	5.56E+00	5.77E+00	1.24E+02	1.14E+01	1.41E+02
Pesticides/PCBs									
Aroclor-1254	7.84E+00	8.96E-03	1.38E-07	8.96E-03	7.67E-04	8.91E+00	4.42E+00	2.63E-01	4.69E+00

PBT = persistent, bioaccumulative, and toxic
RME = Reasonable maximum exposure
SP_r = Soil-to-plant; reproductive
SP_v = Soil-to-plant; vegetative
I_P (kg/kgBW/d) = Plant ingestion rate for red foxes = 0.00437
ADD_P = Average daily dose; plant
I_{P-S} (kg/kgBW/d) = Plant ingestion rate for shrews = 0.0728
AUF_{-F} = Area use factor for fox = 4.50E-03
AUF_s = Area use factor for shrew = 1.0
BAF_i = Soil-to-animal; invertebrates
ADD_A = Average daily dose; animal
I_{A-s} (kg/kgBW/d) = Animal ingestion rate for shrews = 0.487
ADD_S = Average daily dose; soil
I_{S-s} (kg/kgBW/d) = Soil ingestion rate for shrews = 0.0336
Cs (mg/kg) = Concentration in the prey
IR_f = Ingestion rate of food for shrews

CF_r = correction factor [0.10) 0.10 kg dry wt reproductive plant part/kg wet wt]
CF_v = correction factor [0.15) 0.15 kg dry wt vegetative plant part/kg wet wt]
CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]
COPEC = chemical of potential ecological concern
I_A (kg/kgBW/d) = Animal ingestion rate for red foxes = 0.0906
BAF_{-TP} = Animal-to-mammal transfer factor (Ba_{cow} x $BW_{receptor}$ x lipid ratio) where lipid ratio = 1 for inorganics, 0.8 for organics; mammal Ba = biotransfer food to cow, and $BW_{receptor}$ = body wt (kg) of the receptor
I_S (kg/kgBW/d) = Soil ingestion rate for red foxes = 0.00266
ADD_{total} = Average daily dose; total
TRV (mg/kgBW/d) = toxicity reference value
HQ = Hazard quotient
COEC = contaminant of ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1
HQs in **bold font** are >1

Appendix Table R-55. Load Line 4 Preparation and Receiving Area Aggregate Hazard Quotients for Red Foxes Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after ESV screen	**Cs** (mg/kg) Prey ADD_{total}/IR_f	**BAF_{-TP}**	**ADD_A** (mg/kgBW/d) $Cs \; x \; BAF_{-TP} \; x \; I_A \; x \; AUF_{-F}$	**ADD_S** (mg/kgBW/d) $RME \; x \; I_S \; x \; AUF_{-F}$	**ADD_{total}** (mg/kgBW/d) $ADD_p + ADD_A + ADD_S$	**NOAEL TRV** (mg/kgBW/d)	**Site HQ** ADD_{total} / TRV	**COEC?**
Inorganics								
Cadmium	4.73E+00	1.54E-02	2.98E-05	2.82E-05	5.87E-05	5.08E-01	1.15E-04	no
Lead	1.69E+02	1.36E-03	9.38E-05	4.61E-03	4.71E-03	4.22E+00	1.12E-03	no
Zinc	2.51E+02	4.54E-01	4.65E-02	4.06E-03	5.12E-02	8.43E+01	6.07E-04	no
Pesticides/PCBs								
Aroclor-1254	8.37E+00	2.22E-01	7.59E-04	9.39E-05	8.53E-04	1.60E-02	5.32E-02	no

Appendix Table R-56. Load Line 4 Preparation and Receiving Area Aggregate Hazard Quotients for Red-Tailed Hawks Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after the ESV Screens	RME Concentration (mg/kg)	SP_v	ADD_P (mg/kgBW/d) RME x SP_v x CFv x I_P x AUF_{-H}	Prey ADD_P (mg/kgBW/d) RME x SP_v x CFv x I_{P-s} x AUF-s	BAF_i	Prey ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_{A-s} x AUF-s	Prey ADD_S (mg/kgBW/d) RME x I_{S-s} x AUF-s	Prey ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$
Inorganics								
Cadmium	2.36E+00	5.50E-01	0.00E+00	1.42E-02	1.71E+01	2.55E+00	7.92E-02	2.65E+00
Lead	3.85E+02	4.50E-02	0.00E+00	1.89E-01	3.34E+00	8.15E+01	1.29E+01	9.46E+01
Zinc	3.39E+02	1.50E+00	0.00E+00	5.56E+00	5.77E+00	1.24E+02	1.14E+01	1.41E+02
Pesticides/PCBs								
Aroclor-1254	7.84E+00	8.96E-03	0.00E+00	7.67E-04	8.91E+00	4.42E+00	2.63E-01	4.69E+00

PBT = persistent, bioaccumulative, and toxic
COPEC = contaminant of potential ecological concern
ESV = ecological screening value
RME = reasonable maximum concenetration
SP_r = Soil-to-plant; reproductive
SP_v = Soil-to-plant; vegetative
I_P (kg/kgBW/d) = Plant ingestion rate for red-tailed hawks = 0.00
ADD_P = Average daily dose; plant
CF_v = correction factor [0.15) 0.15 kg dry wt vegetative plant part/kg wet wt]
CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]
Cs (mg/kg) = Concentration in the prey
IR_f (kg/kgBW/d)= Ingestion rate of food for shrews = 0.56
BAF_{-TP} = Animal-to-mammal transfer factor (Ba_{cow} x $BW_{receptor}$ x lipid ratio) where lipid ratio = 1 for inorganics, 0.8 for organics; mammal Ba = biotransfer food to c and $BW_{receptor}$ = body wt (kg) of the receptor
I_A (kg/kgBW/d) = Animal ingestion rate for red-tailed hawks = 0.11
I_S (kg/kgBW/d) = Soil ingestion rate for red-tailed hawks = 0.00

Appendix Table R-56. Load Line 4 Preparation and Receiving Area Aggregate Hazard Quotients for Red-Tailed Hawks Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after the ESV Screens	Cs (mg/kg) ADD_{total}/IR_f	BAF_{-TP}	ADD_A (mg/kgBW/d) $Cs \times BAF_{-TP} \times I_A \times AUF_{-H}$	ADD_S (mg/kgBW/d) $RME \times I_S \times AUF_{-H}$	ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Inorganics								
Cadmium	4.73E+00	3.86E-03	5.20E-06	0.00E+00	5.20E-06	1.45E-02	3.58E-04	no
Lead	1.69E+02	3.40E-04	1.64E-05	0.00E+00	1.64E-05	1.13E-02	1.45E-03	no
Zinc	2.51E+02	1.13E-01	8.13E-03	0.00E+00	8.13E-03	1.45E-01	5.61E-02	no
Pesticides/PCBs								
Aroclor-1254	8.37E+00	4.44E-02	1.06E-04	0.00E+00	1.06E-04	1.80E-03	5.89E-02	no

I_{P-s} (kg/kgBW/d) = Plant ingestion rate for shrews (7.28E-02)
AUF_s = Area use factor for shrew (1.0)
BAF_i = Soil-to-animal; invertebrates
ADD_A = Average daily dose; animal
I_{A-s} (kg/kgBW/d) = Animal ingestion rate for shrews (4.87E-01)
ADD_S = Average daily dose; soil
AUF_{-H} = Area use factor hawk 2.59E-03

I_{S-s} (kg/kgBW/d) = Soil ingestion rate for shrews (3.36E-02)
ADD_{total} = Average daily dose; total
TRV (mg/kgBW/d) = toxicity reference value
HQ = Hazard quotient
COEC = contaminant of ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1

Appendix Table R-57. Load Line 4 Packaging and Shipping Area Aggregate Hazard Quotients for Plants and Earthworms Exposed to Surface Soil COPECs at Ravenna, Ohio

COPECs remaining after the EU specific ESV screen	Surface Soil RME Concentrations (mg/kg)	Plants			Earthworms		
		Plant TRV[a] (mg/kg)	Plant HQ Plant TRV/RME	COEC?	Earthworm TRV[b] (mg/kg)	Earthworm HQ Earthworm TRV/RME	COEC?
Inorganics							
Cadmium	3.50E+00	4.00E+00	8.75E-01	no	2.00E+01	1.75E-01	no
Chromium	1.81E+01	1.00E+00	**1.81E+01**	**yes**	4.00E-01	**4.53E+01**	**yes**
Copper	3.91E+01	1.00E+02	3.91E-01	no	6.00E+01	6.52E-01	no
Iron	2.68E+04	1.00E+01	**2.68E+03**	**yes**	No TRV	No TRV	**yes**
Lead	1.82E+02	5.00E+01	**3.63E+00**	**yes**	5.00E+02	3.63E-01	no
Manganese	1.36E+03	5.00E+02	**2.71E+00**	**yes**	No TRV	No TRV	**yes**
Mercury	4.64E-02	3.00E-01	1.55E-01	no	1.00E-01	4.64E-01	no
Zinc	5.65E+02	5.00E+01	**1.13E+01**	**yes**	2.00E+02	**2.83E+00**	**yes**
Pesticides and PCBs							
Aroclor-1254	3.66E-01	4.00E+01	9.15E-03	no	No TRV	No TRV	**yes**

COPEC = chemical of potential ecological concern
EU = exposure unit
ESV = ecological screening value
RME = Reasonable maximum exposure

[a]Plant TRV reference from Efroymson et al. (1997a)
TRV = toxicity reference value
HQ = Hazard quotient
COEC = chemical of potential ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1

[b]Earthworm TRV reference from Efroymson et al. (1997b)
HQs in **bold font** are > 1

Appendix Table R-58. Load Line 4 Packaging and Shipping Area Aggregate Hazard Quotients for Cottontail Rabbits Exposed to Surface Soil COPECs at Ravanna, Ohio

COPECs following ESV screen	RME Concentration (mg/kg)	SP_v	ADD_P (mg/kgBW/d) RME x SP_v x CF x I_P x AUF	BAF_i	ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_A x AUF	ADD_S (mg/kgBW/d) RME x I_S x AUF	ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	NOAEL TRV (mg/kgBW/d)	HQ ADD_{total} / TRV	COEC?
Inorganics										
Cadmium	3.50E+00	5.50E-01	1.30E-02	1.71E+01	0.00E+00	1.06E-02	2.36E-02	7.06E-01	3.34E-02	no
Chromium	1.81E+01	7.50E-03	9.20E-04	1.10E+00	0.00E+00	5.48E-02	5.57E-02	2.00E+03	2.78E-05	no
Copper	3.91E+01	4.00E-01	1.06E-01	4.00E-02	0.00E+00	1.18E-01	2.24E-01	1.11E+01	2.01E-02	no
Iron	2.68E+04	4.00E-03	7.25E-01	3.21E-01	0.00E+00	8.10E+01	8.17E+01	No TRV	No TRV	**yes**
Lead	1.82E+02	4.50E-02	5.53E-02	3.34E+00	0.00E+00	5.49E-01	6.05E-01	5.85E+00	1.03E-01	no
Manganese	1.36E+03	2.50E-01	2.29E+00	6.40E-02	0.00E+00	4.10E+00	6.39E+00	6.44E+01	9.93E-02	no
Mercury	4.64E-02	9.00E-01	2.83E-04	5.23E+00	0.00E+00	1.40E-04	4.23E-04	9.61E-01	4.40E-04	no
Zinc	5.65E+02	1.50E+00	5.74E+00	5.77E+00	0.00E+00	1.71E+00	7.45E+00	1.17E+02	6.36E-02	no
Pesticides and PCBs										
Aroclor-1254	3.66E-01	8.96E-03	2.22E-05	8.91E+00	0.00E+00	1.11E-03	1.13E-03	2.23E-02	5.07E-02	no

COPEC = Constituents of potential ecological concern

ESV = ecological screening value

CF = correction factor dry wt to wet wt[(0.15) 0.15 kd dry plant/kg wet plant]

RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)

SP_v = Soil-to-plant uptake factor; vegetative

ADD_P = Average daily dose; plant

I_P (kg/kgBW/d) = Plant ingestion rate for cottontails = 1.88E-01

AUF = Area use factor = 2.40E-01

BAF_i = Soil-to-animal; invertebrates

ADD_A = Average daily dose; animal

CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]

I_A (kg/kgBW/d) = Animal ingestion rate for cottontails = 0.00E+00

ADD_S = Average daily dose; soil

I_S (kg/kgBW/d) = Soil ingestion rate for cottontails = 1.26E-02

ADDtotal = Average daily dose; total

NOAEL = lowest observed adverse effect level

TRV (mg/kgBW/d) = toxicity reference value

HQ = hazard quotient

COEC = contaminant of ecological concern

"**yes**" = HQ > 1 or "No TRV"

"no" = HQ less than or equal to 1

HQs in **bold font** are > 1

Appendix Table R-59. Load Line 4 Packaging and Shipping Area Aggregate Hazard Quotients for Shrews Exposed to Surface Soil COPECs at Ravanna, Ohio

COPECs following ESV screen	RME Concentration (mg/kg)	SP_v	ADD_P (mg/kgBW/d) RME x SP_v x CF x I_P x AUF	BAF_i	ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_A x AUF	ADD_S (mg/kgBW/d) RME x I_S x AUF	ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	NOAEL TRV (mg/kgBW/d)	HQ ADD_{total} / TRV	COEC?
Inorganics										
Cadmium	3.50E+00	5.50E-01	2.10E-02	1.71E+01	3.79E+00	1.18E-01	3.93E+00	2.05E+00	**1.91E+00**	**yes**
Chromium	1.81E+01	7.50E-03	1.48E-03	1.10E+00	1.26E+00	6.09E-01	1.87E+00	5.83E+03	3.21E-04	no
Copper	3.91E+01	4.00E-01	1.71E-01	4.00E-02	9.91E-02	1.31E+00	1.58E+00	3.24E+01	4.89E-02	no
Iron	2.68E+04	4.00E-03	1.17E+00	3.21E-01	4.19E+03	8.99E+02	5.09E+03	No TRV	No TRV	**yes**
Lead	1.82E+02	4.50E-02	8.93E-02	3.34E+00	3.85E+01	6.11E+00	4.47E+01	1.70E+01	**2.62E+00**	**yes**
Manganese	1.36E+03	2.50E-01	3.70E+00	6.40E-02	5.50E+00	4.56E+01	5.48E+01	1.87E+02	2.92E-01	no
Mercury	4.64E-02	9.00E-01	4.56E-04	5.23E+00	1.54E-02	1.56E-03	1.74E-02	2.80E+00	6.22E-03	no
Zinc	5.65E+02	1.50E+00	9.26E+00	5.77E+00	2.06E+02	1.90E+01	2.35E+02	3.41E+02	6.88E-01	no
Pesticides abd PCBs										
Aroclor-1254	3.66E-01	8.96E-03	3.58E-05	8.91E+00	2.06E-01	1.23E-02	2.19E-01	6.48E-02	**3.38E+00**	**yes**

COPEC = Constituents of potential ecological concern
ESV = ecological screening value
CF = correction factor dry wt to wet wt[(0.15) 0.15 kd dry plant/kg wet plant]
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
SP_v = Soil-to-plant uptake factor; vegetative
ADD_P = Average daily dose; plant
I_P (kg/kgBW/d) = Plant ingestion rate for shrews = 7.28E-02
AUF = Area use factor (1.0)
BAF_i = Soil-to-animal; invertebrates
ADD_A = Average daily dose; animal
CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]

I_A (kg/kgBW/d) = Animal ingestion rate for shrews = 4.87E-01
ADD_S = Average daily dose; soil
I_S (kg/kgBW/d) = Soil ingestion rate for shrews = 3.66E-02
ADDtotal = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1
HQs in **bold font** are >1

Appendix Table R-60. Load Line 4 Packaging and Shipping Area Aggregate Hazard Quotients for Red Foxes Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after ESV screen	RME Concentration (mg/kg)	SP_r	ADD_P (mg/kgBW/d) RME x SP_r x CF_r x I_P x AUF_{-F}	SP_v	Prey ADD_P (mg/kgBW/d) RME x SP_v x CFv x I_{P-s} x AUF-s	BAF_i	Prey ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_{A-s} x AUF-s	Prey ADD_S (mg/kgBW/d) RME x I_{S-s} x AUF-s	Prey ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$
Inorganics									
Cadmium	3.50E+00	1.50E-01	3.39E-07	5.50E-01	2.10E-02	1.71E+01	3.79E+00	1.18E-01	3.93E+00
Lead	1.82E+02	9.00E-03	1.06E-06	4.50E-02	8.93E-02	3.34E+00	3.85E+01	6.11E+00	4.47E+01
Mercury	4.64E-02	2.00E-01	5.99E-09	9.00E-01	4.56E-04	5.23E+00	1.54E-02	1.56E-03	1.74E-02
Zinc	5.65E+02	9.00E-01	3.28E-04	#######	9.26E+00	5.77E+00	2.06E+02	1.90E+01	2.35E+02
Pesticides/PCBs									
Aroclor-1254	3.66E-01	8.96E-03	2.12E-09	8.96E-03	3.58E-05	8.91E+00	2.06E-01	1.23E-02	2.19E-01

PBT = persistent, bioaccumulative, and toxic
RME = Reasonable maximum exposure
SP_r = Soil-to-plant; reproductive
SP_v = Soil-to-plant; vegetative
I_P (kg/kgBW/d) = Plant ingestion rate for red foxes = 0.00437
ADD_P = Average daily dose; plant
I_{P-s} (kg/kgBW/d) = Plant ingestion rate for shrews = 0.0728
AUF_{-F} = Area use factor for fox = 1.48E-03
AUF_s = Area use factor for shrew = 1.0
BAF_i = Soil-to-animal; invertebrates
ADD_A = Average daily dose; animal
I_{A-s} (kg/kgBW/d) = Animal ingestion rate for shrews = 0.487
ADD_S = Average daily dose; soil
I_{S-s} (kg/kgBW/d) = Soil ingestion rate for shrews = 0.0336
Cs (mg/kg) = Concentration in the prey
IR_f = Ingestion rate of food for shrews
CF_r = correction factor [0.10) 0.10 kg dry wt reproductive plant part/kg wet wt]
CF_v = correction factor [0.15) 0.15 kg dry wt vegetative plant part/kg wet wt]
CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]
COPEC = chemical of potential ecological concern
I_A (kg/kgBW/d) = Animal ingestion rate for red foxes = 0.0906
BAF_{-TP} = Animal-to-mammal transfer factor (Ba_{cow} x $BW_{receptor}$ x lipid ratio) where lipid ratio = 1 for inorganics, 0.8 for organics; mammal Ba = biotransfer food to cow, and $BW_{receptor}$ = body wt (kg) of the receptor
I_S (kg/kgBW/d) = Soil ingestion rate for red foxes = 0.00266
ADD_{total} = Average daily dose; total
TRV (mg/kgBW/d) = toxicity reference value
HQ = Hazard quotient
COEC = contaminant of ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1
HQs in **bold font** are >1

Appendix Table R-60. Load Line 4 Packaging and Shipping Area Aggregate Hazard Quotients for Red Foxes Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after ESV screen	**Cs** (mg/kg) Prey ADD_{total}/IR_f	**BAF_{-TP}**	**ADD_A** (mg/kgBW/d) Cs *x* BAF_{-TP} *x* I_A *x* AUF_{-F}	**ADD_S** (mg/kgBW/d) RME *x* I_S *x* AUF_{-F}	**ADD_{total}** (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	**NOAEL TRV** (mg/kgBW/d)	**Site HQ** ADD_{total} / TRV	**COEC?**
Inorganics								
Cadmium	7.02E+00	1.54E-02	1.45E-05	1.38E-05	2.86E-05	5.08E-01	5.62E-05	no
Lead	7.97E+01	1.36E-03	1.45E-05	7.14E-04	7.30E-04	4.22E+00	1.73E-04	no
Mercury	3.10E-02	2.36E-02	9.82E-08	1.82E-07	2.87E-07	6.92E-01	4.14E-07	no
Zinc	4.19E+02	4.54E-01	2.54E-02	2.22E-03	2.80E-02	8.43E+01	3.32E-04	no
Pesticides/PCBs								
Aroclor-1254	3.91E-01	2.22E-01	1.16E-05	1.44E-06	1.31E-05	1.60E-02	8.15E-04	no

Appendix Table R-61. Load Line 4 Packaging and Shipping Area Aggregate Hazard Quotients for Red-Tailed Hawks Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after the ESV Screens	RME Concentration (mg/kg)	SP_v	ADD_P (mg/kgBW/d) RME x SP_v x CFv x I_P x AUF_{-H}	Prey ADD_P (mg/kgBW/d) RME x SP_v x CFv x I_{P-s} x AUF-s	BAF_i	Prey ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_{A-s} x AUF-s	Prey ADD_S (mg/kgBW/d) RME x I_{S-s} x AUF-s	Prey ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$
Inorganics								
Cadmium	3.50E+00	5.50E-01	0.00E+00	2.10E-02	1.71E+01	3.79E+00	1.18E-01	3.93E+00
Lead	1.82E+02	4.50E-02	0.00E+00	8.93E-02	3.34E+00	3.85E+01	6.11E+00	4.47E+01
Mercury	4.64E-02	9.00E-01	0.00E+00	4.56E-04	5.23E+00	1.54E-02	1.56E-03	1.74E-02
Zinc	5.65E+02	1.50E+00	0.00E+00	9.26E+00	5.77E+00	2.06E+02	1.90E+01	2.35E+02
Pesticides/PCBs								
Aroclor-1254	3.66E-01	8.96E-03	0.00E+00	3.58E-05	8.91E+00	2.06E-01	1.23E-02	2.19E-01

PBT = persistent, bioaccumulative, and toxic
COPEC = contaminant of potential ecological concern
ESV = ecological screening value
RME = reasonable maximum concenetration
SP_r = Soil-to-plant; reproductive
SP_v = Soil-to-plant; vegetative
I_P (kg/kgBW/d) = Plant ingestion rate for red-tailed hawks = 0.00
ADD_P = Average daily dose; plant
CF_v = correction factor [0.15) 0.15 kg dry wt vegetative plant part/kg wet wt]
CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]
Cs (mg/kg) = Concentration in the prey
IR_f (kg/kgBW/d)= Ingestion rate of food for shrews = 0.56
BAF_{-TP} = Animal-to-mammal transfer factor (Ba_{tow} x $BW_{receptor}$ x lipid ratio) where lipid ratio = 1 for inorganics, 0.8 for organics; mammal Ba = biotransfer food to cc and $BW_{receptor}$ = body wt (kg) of the receptor
I_A (kg/kgBW/d) = Animal ingestion rate for red-tailed hawks = 0.11
I_S (kg/kgBW/d) = Soil ingestion rate for red-tailed hawks = 0.00

Appendix Table R-61. Load Line 4 Packaging and Shipping Area Aggregate Hazard Quotients for Red-Tailed Hawks Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after the ESV Screens	Cs (mg/kg) ADD_{total}/IR_f	BAF_{-TP}	ADD_A (mg/kgBW/d) $Cs\ x\ BAF_{-TP}\ x\ I_A\ x\ AUF_{-H}$	ADD_S (mg/kgBW/d) $RME\ x\ I_S\ x\ AUF_{-H}$	ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Inorganics								
Cadmium	7.02E+00	3.86E-03	2.53E-06	0.00E+00	2.53E-06	1.45E-02	1.75E-04	no
Lead	7.97E+01	3.40E-04	2.54E-06	0.00E+00	2.54E-06	1.13E-02	2.24E-04	no
Mercury	3.10E-02	5.90E-03	1.71E-08	0.00E+00	1.71E-08	4.50E-03	3.81E-06	no
Zinc	4.19E+02	1.13E-01	4.44E-03	0.00E+00	4.44E-03	1.45E-01	3.07E-02	no
Aroclor-1254	3.91E-01	5.55E-02	2.03E-06	0.00E+00	2.03E-06	1.80E-03	1.13E-03	no

I_{P-s} (kg/kgBW/d) = Plant ingestion rate for shrews (7.28E-02)
AUF_s = Area use factor for shrew (1.0)
BAF_i = Soil-to-animal; invertebrates
ADD_A = Average daily dose; animal
I_{A-s} (kg/kgBW/d) = Animal ingestion rate for shrews (4.87E-01)
ADD_S = Average daily dose; soil
AUF_h = Area use factor hawk 8.50E-04

I_{S-s} (kg/kgBW/d) = Soil ingestion rate for shrews (3.36E-02)
ADD_{total} = Average daily dose; total
TRV (mg/kgBW/d) = toxicity reference value
HQ = Hazard quotient
COEC = contaminant of ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1

Appendix Table R-62. Load Line 4 Perimeter Area Aggregate Hazard Quotients for Plants and Earthworms Exposed to Surface Soil COPECs at Ravenna, Ohio

COPECs remaining after the EU specific ESV screen	Surface Soil RME Concentrations (mg/kg)	Plants			Earthworms		
		Plant TRV[a] (mg/kg)	Plant HQ Plant TRV/RME	COEC?	Earthworm TRV[b] (mg/kg)	Earthworm HQ Earthworm TRV/RME	COEC?
Inorganics							
Cadmium	2.70E-01	4.00E+00	6.75E-02	no	2.00E+01	1.35E-02	no
Iron	1.82E+04	1.00E+01	**1.82E+03**	**yes**	No TRV	No TRV	**yes**
Lead	2.27E+02	5.00E+01	**4.54E+00**	**yes**	5.00E+02	4.54E-01	no
Manganese	6.56E+02	5.00E+02	**1.31E+00**	**yes**	No TRV	No TRV	**yes**
Zinc	6.81E+01	5.00E+01	**1.36E+00**	**yes**	2.00E+02	3.41E-01	no

COPEC = chemical of potential ecological concern
EU = exposure unit
ESV = ecological screening value
RME = Reasonable maximum exposure

[a]Plant TRV reference from Efroymson et al. (1997a)
TRV = toxicity reference value
HQ = Hazard quotient
COEC = chemical of potential ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1

[b]Earthworm TRV reference from Efroymson et al. (1997b)
HQs in **bold font** are > 1

Appendix Table R-63. Load Line 4 Perimeter Area Aggregate Hazard Quotients for Cottontail Rabbits Exposed to Surface Soil COPECs at Ravanna, Ohio

COPECs following ESV screen	RME Concentration (mg/kg)	SP_v	ADD_P (mg/kgBW/d) RME x SP_v x CF x I_P x AUF	BAF_i	ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_A x AUF	ADD_S (mg/kgBW/d) RME x I_S x AUF	ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	NOAEL TRV (mg/kgBW/d)	HQ ADD_{total} / TRV	COEC?
Inorganics										
Cadmium	2.70E-01	5.50E-01	4.19E-03	1.71E+01	0.00E+00	3.40E-03	7.59E-03	7.06E-01	1.08E-02	no
Iron	1.82E+04	4.00E-03	2.06E+00	3.21E-01	0.00E+00	2.30E+02	2.32E+02	No TRV	No TRV	**yes**
Lead	2.27E+02	4.50E-02	2.88E-01	3.34E+00	0.00E+00	2.86E+00	3.15E+00	5.85E+00	5.38E-01	no
Manganese	6.56E+02	2.50E-01	4.62E+00	6.40E-02	0.00E+00	8.26E+00	1.29E+01	6.44E+01	2.00E-01	no
Zinc	6.81E+01	1.50E+00	2.88E+00	5.77E+00	0.00E+00	8.59E-01	3.74E+00	1.17E+02	3.19E-02	no

COPEC = Constituents of potential ecological concern

ESV = ecological screening value

CF = correction factor dry wt to wet wt[(0.15) 0.15 kd dry plant/kg wet plant]

RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)

SP_v = Soil-to-plant uptake factor; vegetative

ADD_P = Average daily dose; plant

I_P (kg/kgBW/d) = Plant ingestion rate for cottontails = 1.88E-01

AUF = Area use factor (1.0)

BAF_i = Soil-to-animal; invertebrates

ADD_A = Average daily dose; animal

CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]

I_A (kg/kgBW/d) = Animal ingestion rate for cottontails = 0.00E+00

ADD_S = Average daily dose; soil

I_S (kg/kgBW/d) = Soil ingestion rate for cottontails = 1.26E-02

ADDtotal = Average daily dose; total

NOAEL = lowest observed adverse effect level

TRV (mg/kgBW/d) = toxicity reference value

HQ = hazard quotient

COEC = contaminant of ecological concern

"**yes**" = HQ > 1 or "No TRV"

"no" = HQ less than or equal to 1

HQs in **bold font** are > 1

Appendix Table R-64. Load Line 4 Perimeter Area Aggregate Hazard Quotients for Shrews Exposed to Surface Soil COPECs at Ravanna, Ohio

COPECs following ESV screen	**RME Concentration** (mg/kg)	**SP_v**	**ADD_P** (mg/kgBW/d) RME x SP_v x CF x I_P x AUF	**BAF_i**	**ADD_A** (mg/kgBW/d) RME x BAF_i x CF_i x I_A x AUF	**ADD_S** (mg/kgBW/d) RME x I_S x AUF	**ADD_{total}** (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	**NOAEL TRV** (mg/kgBW/d)	**HQ** ADD_{total} / TRV	**COEC?**
Inorganics										
Cadmium	2.70E-01	5.50E-01	1.62E-03	1.71E+01	2.93E-01	9.07E-03	3.03E-01	2.05E+00	1.48E-01	no
Iron	1.82E+04	4.00E-03	7.97E-01	3.21E-01	2.85E+03	6.13E+02	3.47E+03	No TRV	No TRV	**yes**
Lead	2.27E+02	4.50E-02	1.12E-01	3.34E+00	4.80E+01	7.63E+00	5.58E+01	1.70E+01	**3.27E+00**	**yes**
Manganese	6.56E+02	2.50E-01	1.79E+00	6.40E-02	2.66E+00	2.20E+01	2.65E+01	1.87E+02	1.41E-01	no
Zinc	6.81E+01	1.50E+00	1.12E+00	5.77E+00	2.49E+01	2.29E+00	2.83E+01	3.41E+02	8.30E-02	no

COPEC = Constituents of potential ecological concern

ESV = ecological screening value

CF = correction factor dry wt to wet wt[(0.15) 0.15 kd dry plant/kg wet plant]

RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)

SP_v = Soil-to-plant uptake factor; vegetative

ADD_P = Average daily dose; plant

I_P (kg/kgBW/d) = Plant ingestion rate for shrews = 7.28E-02

AUF = Area use factor (1.0)

BAF_i = Soil-to-animal; invertebrates

ADD_A = Average daily dose; animal

CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]

I_A (kg/kgBW/d) = Animal ingestion rate for shrews = 4.87E-01

ADD_S = Average daily dose; soil

I_S (kg/kgBW/d) = Soil ingestion rate for shrews = 3.66E-02

ADDtotal = Average daily dose; total

NOAEL = lowest observed adverse effect level

TRV (mg/kgBW/d) = toxicity reference value

HQ = hazard quotient

COEC = contaminant of ecological concern

"**yes**" = HQ > 1 or "No TRV"

"no" = HQ less than or equal to 1

HQs in **bold font** are >1

Appendix Table R-65. Load Line 4 Perimeter Area Aggregate Hazard Quotients for Red Foxes Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after ESV screen	RME Concentration (mg/kg)	SP_r	ADD_P (mg/kgBW/d) RME x SP_r x CF_r x I_P x AUF_{-F}	SP_v	Prey ADD_P (mg/kgBW/d) RME x SP_v x CFv x I_{P-S} x AUF-s	BAF_i	Prey ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_{A-S} x AUF-s	Prey ADD_S (mg/kgBW/d) RME x I_{S-s} x AUF-s	Prey ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$
Inorganics									
Cadmium	2.70E-01	1.50E-01	1.60E-06	5.50E-01	1.62E-03	1.71E+01	2.93E-01	9.07E-03	3.03E-01
Lead	2.27E+02	9.00E-03	8.07E-05	4.50E-02	1.12E-01	3.34E+00	4.80E+01	7.63E+00	5.58E+01
Zinc	6.81E+01	9.00E-01	2.42E-03	1.50E+00	1.12E+00	5.77E+00	2.49E+01	2.29E+00	2.83E+01

PBT = persistent, bioaccumulative, and toxic
RME = Reasonable maximum exposure
SP_r = Soil-to-plant; reproductive
SP_v = Soil-to-plant; vegetative
I_P (kg/kgBW/d) = Plant ingestion rate for red foxes = 0.00437
ADD_P = Average daily dose; plant
I_{P-s} (kg/kgBW/d) = Plant ingestion rate for shrews = 0.0728
AUF_{-F} = Area use factor for fox = 9.04E-02
AUF_s = Area use factor for shrew = 1.0
BAF_i = Soil-to-animal; invertebrates
ADD_A = Average daily dose; animal
I_{A-s} (kg/kgBW/d) = Animal ingestion rate for shrews = 0.487
ADD_S = Average daily dose; soil
I_{S-s} (kg/kgBW/d) = Soil ingestion rate for shrews = 0.0336
Cs (mg/kg) = Concentration in the prey
IR_f = Ingestion rate of food for shrews

CF_r = correction factor [0.10) 0.10 kg dry wt reproductive plant part/kg wet wt]
CF_v = correction factor [0.15) 0.15 kg dry wt vegetative plant part/kg wet wt]
CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]
COPEC = chemical of potential ecological concern
I_A (kg/kgBW/d) = Animal ingestion rate for red foxes = 0.0906
BAF_{-TP} = Animal-to-mammal transfer factor (Ba_{cow} x $BW_{receptor}$ x lipid ratio) where lipid ratio = 1 for inorganics, 0.8 for organics; mammal Ba = biotransfer food to cow, and $BW_{receptor}$ = body wt (kg) of the receptor
I_S (kg/kgBW/d) = Soil ingestion rate for red foxes = 0.00266
ADD_{total} = Average daily dose; total
TRV (mg/kgBW/d) = toxicity reference value
HQ = Hazard quotient
COEC = contaminant of ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1
HQs in **bold font** are >1

Appendix Table R-65. Load Line 4 Perimeter Aggregate Hazard Quotients for Red Foxes Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after ESV screen	**Cs** (mg/kg) Prey ADD_{total}/IR_f	**BAF_{-TP}**	**ADD_A** (mg/kgBW/d) $Cs\ x\ BAF_{-TP}\ x\ I_A\ x\ AUF_{-F}$	**ADD_S** (mg/kgBW/d) $RME\ x\ I_S\ x\ AUF_{-F}$	**ADD_{total}** (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	**NOAEL TRV** (mg/kgBW/d)	**Site HQ** ADD_{total} / TRV	**COEC?**
Inorganics								
Cadmium	5.41E-01	1.54E-02	6.84E-05	6.49E-05	1.35E-04	5.08E-01	2.65E-04	no
Lead	9.96E+01	1.36E-03	1.11E-03	5.46E-02	5.58E-02	4.22E+00	1.32E-02	no
Zinc	5.05E+01	4.54E-01	1.88E-01	1.64E-02	2.07E-01	8.43E+01	2.45E-03	no

Appendix Table R-66. Load Line 4 Perimeter Area Aggregate Hazard Quotients for Red-Tailed Hawks Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after the ESV Screens	RME Concentration (mg/kg)	SP_v	ADD_P (mg/kgBW/d) RME x SP_v x CFv x I_P x AUF_{-H}	Prey ADD_P (mg/kgBW/d) RME x SP_v x CFv x I_{P-S} x AUF-s	BAF_i	Prey ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_{A-S} x AUF-s	Prey ADD_S (mg/kgBW/d) RME x I_{S-S} x AUF-s	Prey ADD_{total} (mg/kgBW/d) ADD_P + ADD_A + ADD_S
Inorganics								
Cadmium	2.70E-01	5.50E-01	0.00E+00	1.62E-03	1.71E+01	2.93E-01	9.07E-03	3.03E-01
Lead	2.27E+02	4.50E-02	0.00E+00	1.12E-01	3.34E+00	4.80E+01	7.63E+00	5.58E+01
Zinc	6.81E+01	1.50E+00	0.00E+00	1.12E+00	5.77E+00	2.49E+01	2.29E+00	2.83E+01

PBT = persistent, bioaccumulative, and toxic
COPEC = contaminant of potential ecological concern
ESV = ecological screening value
RME = reasonable maximum concenetration
SP_r = Soil-to-plant; reproductive
SP_v = Soil-to-plant; vegetative
I_P (kg/kgBW/d) = Plant ingestion rate for red-tailed hawks = 0.00
ADD_P = Average daily dose; plant
CF_v = correction factor [0.15) 0.15 kg dry wt vegetative plant part/kg wet wt]
CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]
Cs (mg/kg) = Concentration in the prey
IR_f (kg/kgBW/d)= Ingestion rate of food for shrews = 0.56
BAF_{-TP} = Animal-to-mammal transfer factor (Ba_{cow} x $BW_{receptor}$ x lipid ratio) where lipid ratio = 1 for inorganics, 0.8 for organics; mammal Ba = biotransfer food to cow, and $BW_{receptor}$ = body wt (kg) of the receptor
I_A (kg/kgBW/d) = Animal ingestion rate for red-tailed hawks = 0.11
I_S (kg/kgBW/d) = Soil ingestion rate for red-tailed hawks = 0.00

Appendix Table R-66. Load Line 4 Perimeter Area Aggregate Hazard Quotients for Red-Tailed Hawks Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after the ESV Screens	Cs (mg/kg) ADD_{total}/IR_f	BAF_{-TP}	ADD_A (mg/kgBW/d) $Cs \times BAF_{-TP} \times I_A \times AUF_{-H}$	ADD_S (mg/kgBW/d) $RME \times I_S \times AUF_{-H}$	ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Inorganics								
Cadmium	5.41E-01	3.86E-03	1.19E-05	0.00E+00	1.19E-05	1.45E-02	8.24E-04	no
Lead	9.96E+01	3.40E-04	1.94E-04	0.00E+00	1.94E-04	1.13E-02	1.72E-02	no
Zinc	5.05E+01	1.13E-01	3.28E-02	0.00E+00	3.28E-02	1.45E-01	2.26E-01	no

I_{P-s} (kg/kgBW/d) = Plant ingestion rate for shrews (7.28E-02)
AUF_s = Area use factor for shrew (1.0)
BAF_i = Soil-to-animal; invertebrates
ADD_A = Average daily dose; animal
I_{A-s} (kg/kgBW/d) = Animal ingestion rate for shrews (4.87E-01)
ADD_S = Average daily dose; soil
AUF_h = Area use factor hawk 5.20E-02

I_{S-s} (kg/kgBW/d) = Soil ingestion rate for shrews (3.36E-02)
ADD_{total} = Average daily dose; total
TRV (mg/kgBW/d) = toxicity reference value
HQ = Hazard quotient
COEC = contaminant of ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1

Appendix Table R-67. Load Line 4 Melt-Pour Draniage Ditches Aggregate Hazard Quotients for Plants and Earthworms Exposed to Surface Soil COPECs at Ravenna, Ohio

		Plants			Earthworms		
COPECs remaining after the EU specific ESV screen	**Surface Soil RME Concentrations** (mg/kg)	**Plant TRV[a]** (mg/kg)	**Plant HQ Plant TRV/RME**	**COEC?**	**Earthworm TRV[b]** (mg/kg)	**Earthworm HQ Earthworm TRV/RME**	**COEC?**
Inorganics							
Arsenic	1.08E+01	1.00E+01	**1.08E+00**	**yes**	6.00E+01	1.80E-01	no
Cadmium	2.00E-01	4.00E+00	5.00E-02	no	2.00E+01	1.00E-02	no
Chromium	1.13E+01	1.00E+00	**1.13E+01**	**yes**	4.00E-01	**2.84E+01**	**yes**
Copper	1.69E+01	1.00E+02	1.69E-01	no	6.00E+01	2.81E-01	no
Iron	2.18E+04	1.00E+01	**2.18E+03**	**yes**	No TRV	No TRV	**yes**
Lead	1.73E+01	5.00E+01	3.45E-01	no	5.00E+02	3.45E-02	no
Magnesium	3.15E+03	No TRV	No TRV	**yes**	No TRV	No TRV	**yes**
Zinc	8.01E+01	5.00E+01	**1.60E+00**	**yes**	2.00E+02	4.01E-01	no

COPEC = chemical of potential ecological concern
EU = exposure unit
ESV = ecological screening value
RME = Reasonable maximum exposure

[a]Plant TRV reference from Efroymson et al. (1997a)
TRV = toxicity reference value
HQ = Hazard quotient
COEC = chemical of potential ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1

[b]Earthworm TRV reference from Efroymson et al. (1997b)
HQs in **bold font** are > 1

Appendix Table R-68. Load Line 4 Melt-Pour Drainage Ditches Aggregate Hazard Quotients for Cottontail Rabbits Exposed to Surface Soil COPECs at Ravanna, Ohio

COPECs following ESV screen	**RME Concentration** (mg/kg)	**SP_v**	**ADD_P** (mg/kgBW/d) RME *x* SP_v *x* *CF* *x* I_P *x* AUF	**BAF_i**	**ADD_A** (mg/kgBW/d) RME *x* BAF_i *x* CF_i *x* I_A *x* AUF	**ADD_S** (mg/kgBW/d) RME *x* I_S *x* AUF	**ADD_{total}** (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	**NOAEL TRV** (mg/kgBW/d)	**HQ** ADD_{total} / TRV	**COEC?**
Inorganics										
Arsenic	1.08E+01	4.00E-02	2.29E-03	2.58E-01	0.00E+00	2.55E-02	2.78E-02	4.99E-02	5.58E-01	no
Cadmium	2.00E-01	5.50E-01	5.83E-04	1.71E+01	0.00E+00	4.74E-04	1.06E-03	7.06E-01	1.50E-03	no
Chromium	1.13E+01	7.50E-03	4.51E-04	1.10E+00	0.00E+00	2.69E-02	2.73E-02	2.00E+03	1.36E-05	no
Copper	1.69E+01	4.00E-01	3.58E-02	4.00E-02	0.00E+00	3.99E-02	7.57E-02	1.11E+01	6.79E-03	no
Iron	2.18E+04	4.00E-03	4.61E-01	3.21E-01	0.00E+00	5.15E+01	5.20E+01	No TRV	No TRV	**yes**
Lead	1.73E+01	4.50E-02	4.12E-03	3.34E+00	0.00E+00	4.09E-02	4.50E-02	5.85E+00	7.69E-03	no
Magnesium	3.15E+03	1.00E+00	1.67E+01	3.21E-01	0.00E+00	7.47E+00	2.42E+01	No TRV	No TRV	**yes**
Zinc	8.01E+01	1.50E+00	6.37E-01	5.77E+00	0.00E+00	1.90E-01	8.27E-01	1.17E+02	7.06E-03	no

COPEC = Constituents of potential ecological concern

ESV = ecological screening value

CF = correction factor dry wt to wet wt[(0.15) 0.15 kd dry plant/kg wet plant]

RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)

SP_v = Soil-to-plant uptake factor; vegetative

ADD_P = Average daily dose; plant

I_P (kg/kgBW/d) = Plant ingestion rate for cottontails = 1.88E-01

AUF = Area use factor = 1.88E-01

BAF_i = Soil-to-animal; invertebrates

ADD_A = Average daily dose; animal

CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]

I_A (kg/kgBW/d) = Animal ingestion rate for cottontails = 0.00E+00

ADD_S = Average daily dose; soil

I_S (kg/kgBW/d) = Soil ingestion rate for cottontails = 1.26E-02

ADDtotal = Average daily dose; total

NOAEL = lowest observed adverse effect level

TRV (mg/kgBW/d) = toxicity reference value

HQ = hazard quotient

COEC = contaminant of ecological concern

"**yes**" = HQ > 1 or "No TRV"

"no" = HQ less than or equal to 1

HQs in **bold font** are > 1

Appendix Table R-69. Load Line 4 Melt-Pour Drainage Ditches Aggregate Hazard Quotients for Shrews Exposed to Surface Soil COPECs at Ravanna, Ohio

COPECs following ESV screen	RME Concentration (mg/kg)	SP_v	ADD_P (mg/kgBW/d) RME x SP_v x CF x I_P x AUF	BAF_i	ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_A x AUF	ADD_S (mg/kgBW/d) RME x I_S x AUF	ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	NOAEL TRV (mg/kgBW/d)	HQ ADD_{total} / TRV	COEC?
Inorganics										
Arsenic	1.08E+01	4.00E-02	4.71E-03	2.58E-01	1.76E-01	3.62E-01	5.43E-01	1.45E-01	**3.74E+00**	**yes**
Cadmium	2.00E-01	5.50E-01	1.20E-03	1.71E+01	2.17E-01	6.72E-03	2.24E-01	2.05E+00	1.09E-01	no
Chromium	1.13E+01	7.50E-03	9.29E-04	1.10E+00	7.89E-01	3.81E-01	1.17E+00	5.83E+03	2.01E-04	no
Copper	1.69E+01	4.00E-01	7.36E-02	4.00E-02	4.27E-02	5.66E-01	6.83E-01	3.24E+01	2.11E-02	no
Iron	2.18E+04	4.00E-03	9.50E-01	3.21E-01	3.40E+03	7.31E+02	4.14E+03	No TRV	**No TRV**	**yes**
Lead	1.73E+01	4.50E-02	8.49E-03	3.34E+00	3.66E+00	5.80E-01	4.24E+00	1.70E+01	2.49E-01	no
Magnesium	3.15E+03	1.00E+00	3.44E+01	3.21E-01	4.93E+02	1.06E+02	6.33E+02	No TRV	No TRV	**yes**
Zinc	8.01E+01	1.50E+00	1.31E+00	5.77E+00	2.93E+01	2.69E+00	3.33E+01	3.41E+02	9.76E-02	no

COPEC = Constituents of potential ecological concern

ESV = ecological screening value

CF = correction factor dry wt to wet wt[(0.15) 0.15 kd dry plant/kg wet plant]

RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)

SP_v = Soil-to-plant uptake factor; vegetative

ADD_P = Average daily dose; plant

I_P (kg/kgBW/d) = Plant ingestion rate for shrews = 7.28E-02

AUF = Area use factor (1.0)

BAF_i = Soil-to-animal; invertebrates

ADD_A = Average daily dose; animal

CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]

I_A (kg/kgBW/d) = Animal ingestion rate for shrews = 4.87E-01

ADD_S = Average daily dose; soil

I_S (kg/kgBW/d) = Soil ingestion rate for shrews = 3.66E-02

ADDtotal = Average daily dose; total

NOAEL = lowest observed adverse effect level

TRV (mg/kgBW/d) = toxicity reference value

HQ = hazard quotient

COEC = contaminant of ecological concern

"**yes**" = HQ > 1 or "No TRV"

"no" = HQ less than or equal to 1

HQs in **bold font** are >1

Appendix Table R-70. Load Line 4 Melt-Pour Drainage Ditches Aggregate Hazard Quotients for Red Foxes Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after ESV screen	RME Concentration (mg/kg)	SP_r	ADD_P (mg/kgBW/d) RME x SP_r x CF_r x I_P x AUF_{-F}	SP_v	Prey ADD_P (mg/kgBW/d) RME x SP_v x CFv x I_{P-s} x AUF-s	BAF_i	Prey ADD_A (mg/kgBW/d) RME x BAF_i x CF_i x I_{A-s} x AUF-s	Prey ADD_S (mg/kgBW/d) RME x I_{S-s} x AUF-s	Prey ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$
Inorganics									
Cadmium	2.00E-01	1.50E-01	1.51E-08	5.50E-01	1.20E-03	1.71E+01	2.17E-01	6.72E-03	2.24E-01
Lead	1.73E+01	9.00E-03	7.84E-08	4.50E-02	8.49E-03	3.34E+00	3.66E+00	5.80E-01	4.24E+00
Zinc	8.01E+01	9.00E-01	3.63E-05	#######	1.31E+00	5.77E+00	2.93E+01	2.69E+00	3.33E+01

PBT = persistent, bioaccumulative, and toxic
RME = Reasonable maximum exposure
SP_r = Soil-to-plant; reproductive
SP_v = Soil-to-plant; vegetative
I_P (kg/kgBW/d) = Plant ingestion rate for red foxes = 0.00437
ADD_P = Average daily dose; plant
I_{P-s} (kg/kgBW/d) = Plant ingestion rate for shrews = 0.0728
AUF_{-F} = Area use factor for fox = 1.15E-03
AUF_s = Area use factor for shrew = 1.0
BAF_i = Soil-to-animal; invertebrates
ADD_A = Average daily dose; animal
I_{A-s} (kg/kgBW/d) = Animal ingestion rate for shrews = 0.487
ADD_S = Average daily dose; soil
I_{S-s} (kg/kgBW/d) = Soil ingestion rate for shrews = 0.0336
Cs (mg/kg) = Concentration in the prey
IR_f = Ingestion rate of food for shrews

CF_r = correction factor [0.10) 0.10 kg dry wt reproductive plant part/kg wet wt]
CF_v = correction factor [0.15) 0.15 kg dry wt vegetative plant part/kg wet wt]
CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]
COPEC = chemical of potential ecological concern
I_A (kg/kgBW/d) = Animal ingestion rate for red foxes = 0.0906
BAF_{-TP} = Animal-to-mammal transfer factor (Ba_{cow} x $BW_{receptor}$ x lipid ratio) where lipid ratio = 1 for inorganics, 0.8 for organics; mammal Ba = biotransfer food to cow, and $BW_{receptor}$ = body wt (kg) of the receptor
I_S (kg/kgBW/d) = Soil ingestion rate for red foxes = 0.00266
ADD_{total} = Average daily dose; total
TRV (mg/kgBW/d) = toxicity reference value
HQ = Hazard quotient
COEC = contaminant of ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1
HQs in **bold font** are >1

Appendix Table R-70. Load Line 4 Melt-Pour Drainage Ditches Aggregate Hazard Quotients for Red Foxes Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after ESV screen	Cs (mg/kg) Prey ADD_{total}/IR_f	BAF_{-TP}	ADD_A (mg/kgBW/d) $Cs \times BAF_{-TP} \times I_A \times AUF_{-F}$	ADD_S (mg/kgBW/d) $RME \times I_S \times AUF_{-F}$	ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Inorganics								
Cadmium	4.01E-01	1.54E-02	6.46E-07	6.13E-07	1.27E-06	5.08E-01	2.51E-06	no
Lead	7.58E+00	1.36E-03	1.08E-06	5.30E-05	5.42E-05	4.22E+00	1.28E-05	no
Zinc	5.94E+01	4.54E-01	2.82E-03	2.46E-04	3.10E-03	8.43E+01	3.67E-05	no

Appendix Table R-71. Load Line 4 Melt-Pour Drainage Ditches Aggregate Hazard Quotients for Red-Tailed Hawks Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after the ESV Screens	RME Concentration (mg/kg)	SP_v	ADD_P (mg/kgBW/d) RME x $SP_v x$ CFv x $I_P x$ AUF_{-H}	Prey ADD_P (mg/kgBW/d) RME x $SP_v x$ CFv x $I_{P-S} x$ AUF-s	BAF_i	Prey ADD_A (mg/kgBW/d) RME x $BAF_i x$ CF_i x $I_{A-S} x$ AUF-s	Prey ADD_S (mg/kgBW/d) RME x $I_{S-S} x$ AUF-s	Prey ADD_{total} (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$
Inorganics								
Cadmium	2.00E-01	5.50E-01	0.00E+00	1.20E-03	1.71E+01	2.17E-01	6.72E-03	2.24E-01
Lead	1.73E+01	4.50E-02	0.00E+00	8.49E-03	3.34E+00	3.66E+00	5.80E-01	4.24E+00
Zinc	8.01E+01	1.50E+00	0.00E+00	1.31E+00	5.77E+00	2.93E+01	2.69E+00	3.33E+01

PBT = persistent, bioaccumulative, and toxic

COPEC = contaminant of potential ecological concern

ESV = ecological screening value

RME = reasonable maximum concenetration

SP_r = Soil-to-plant; reproductive

SP_v = Soil-to-plant; vegetative

I_P (kg/kgBW/d) = Plant ingestion rate for red-tailed hawks = 0.00

ADD_P = Average daily dose; plant

CF_v = correction factor [0.15) 0.15 kg dry wt vegetative plant part/kg wet wt]

CF_i = correction factor (earthworms) [(0.13) for As, Cd, Cr, Cu, Hg, Mn, Ni, Pb, Zn, PCBs, and 1 for all other COPECs - fraction dry wt worm/kg wet wet]

Cs (mg/kg) = Concentration in the prey

IR_f (kg/kgBW/d)= Ingestion rate of food for shrews = 0.56

BAF_{-TP} = Animal-to-mammal transfer factor (Ba_{tow} x $BW_{receptor}$ x lipid ratio) where lipid ratio = 1 for inorganics, 0.8 for organics; mammal Ba = biotransfer food to cc and $BW_{receptor}$ = body wt (kg) of the receptor

I_A (kg/kgBW/d) = Animal ingestion rate for red-tailed hawks = 0.11

I_S (kg/kgBW/d) = Soil ingestion rate for red-tailed hawks = 0.00

Appendix Table R-71. Load Line 4 Melt-Pour Drainage Ditches Aggregate Hazard Quotients for Red-Tailed Hawks Exposed to Surface Soil PBT COPECs at Ravenna, Ohio

PBT COPECs remaining after the ESV Screens	**Cs** (mg/kg) ADD_{total}/IR_f	**BAF_{-TP}**	**ADD_A** (mg/kgBW/d) $Cs \times BAF_{-TP} \times I_A \times AUF_{-H}$	**ADD_S** (mg/kgBW/d) $RME \times I_S \times AUF_{-H}$	**ADD_{total}** (mg/kgBW/d) $ADD_P + ADD_A + ADD_S$	**NOAEL TRV** (mg/kgBW/d)	**Site HQ** ADD_{total} / TRV	**COEC?**
Inorganics								
Cadmium	4.01E-01	3.86E-03	1.13E-07	0.00E+00	1.13E-07	1.45E-02	7.78E-06	no
Lead	7.58E+00	3.40E-04	1.88E-07	0.00E+00	1.88E-07	1.13E-02	1.67E-05	no
Zinc	5.94E+01	1.13E-01	4.92E-04	0.00E+00	4.92E-04	1.45E-01	3.39E-03	no

I_{P-s} (kg/kgBW/d) = Plant ingestion rate for shrews (7.28E-02)
AUF_s = Area use factor for shrew (1.0)
BAF_i = Soil-to-animal; invertebrates
ADD_A = Average daily dose; animal
I_{A-s} (kg/kgBW/d) = Animal ingestion rate for shrews (4.87E-01)
ADD_S = Average daily dose; soil
AUF_h = Area use factor hawk 6.64E-04

I_{S-s} (kg/kgBW/d) = Soil ingestion rate for shrews (3.36E-02)
ADD_{total} = Average daily dose; total
TRV (mg/kgBW/d) = toxicity reference value
HQ = Hazard quotient
COEC = contaminant of ecological concern
"**yes**" = HQ > 1 or "No TRV"
"no" = HQ less than or equal to 1

Appendix Table R-72. Load Line 4 Main Stream Segment Upstream of Perimeter Road Hazard Quotients for Sediment Biota Exposed to Sediment COPECs at Ravenna, Ohio

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/kg)	NOAEL TRV (mg/kg)	Site HQ (RME/TRV)	COEC?
Metals					
Beryllium	7440-41-7	5.60E-01	none	No TRV	**yes**
Cadmium	7440-43-9	2.50E-01	9.90E-01	2.53E-01	no
Calcium	7440-70-2	1.40E+03	none	No TRV	**yes**
Magnesium	7439-95-4	4.20E+03	none	No TRV	**yes**
Explosives					
2,4,6-Trinitrotoluene	118-96-7	3.40E-01	none	No TRV	**yes**

CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-73. Load Line 4 Main Stream Segment Upstream of Perimeter Road Hazard Quotients for Muskrats Exposed to Sediment COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/kg)	SP_v (kg/kg)	ADD_P (mg/kgBW/d) RME x SP_V x CF x I_P x AUF[a]	ADD_{Sed} (mg/kgBW/d) RME x I_S x AUF[a]	ADD_{total} (mg/kgBW/d) ADD_P + ADD_{Sed}	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Metals									
Beryllium	7440-41-7	5.60E-01	1.00E-02	2.33E-04	0.00E+00	2.33E-04	4.88E-01	4.77E-04	no
Cadmium	7440-43-9	2.50E-01	5.50E-01	5.71E-03	0.00E+00	5.71E-03	7.13E-01	8.01E-03	no
Calcium	7440-70-2	1.40E+03	3.50E+00	2.04E+02	0.00E+00	2.04E+02	none	No TRV	**yes**
Magnesium	7439-95-4	4.20E+03	1.00E+00	1.74E+02	0.00E+00	1.74E+02	none	No TRV	**yes**
Explosives									
2,4,6-Trinitrotoluene	118-96-7	3.40E-01	4.60E+00	6.50E-02	0.00E+00	6.50E-02	1.18E+00	5.50E-02	no

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
SP_v = Sediment-to-plant uptake factor; vegetative
CF = correction factor dry wt to wet wet [(0.15) because 0.15 kg dry plant/kg wet plant]
ADD_P = Average daily dose; plant
I_P (kg/kgBW/d) = Plant ingestion rate for muskrats = 3.0E-01
AUF = Area use factor
[b] AUF = 0.12 ha / 0.13 ha = 9.23E-01

ADD_{Sed} = Average daily dose; sediment
I_S (kg/kgBW/d) = Sediment ingestion rate for muskrats = 0
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"

"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-74. Load Line 4 Main Stream Segment Upstream of Perimeter Road Hazard Quotients for Mallard Ducks Exposed to Sediment COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/kg)	SP_v (kg/kg)	SPr (kg/kg)	ADD_P (mg/kgBW/d) RME x (0.5 x SP_v x CFv + 0.5 x SPr x CFr) x I_P x AUF[a,b]	ADD_{Sed} (mg/kgBW/d) RME x I_S x AUF[b]	ADD_{total} (mg/kgBW/d) ADD_P + ADD_{Sed}	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Metals										
Beryllium	7440-41-7	5.60E-01	1.00E-02	1.50E-03	1.36E-08	2.92E-07	3.06E-07	none	No TRV	**yes**
Cadmium	7440-43-9	2.50E-01	5.50E-01	1.50E-01	4.63E-07	1.30E-07	5.93E-07	1.45E+00	4.09E-07	no
Calcium	7440-70-2	1.40E+03	3.50E+00	3.50E-01	1.00E-02	7.30E-04	1.07E-02	none	No TRV	**yes**
Magnesium	7439-95-4	4.20E+03	1.00E+00	5.50E-01	2.31E-02	2.19E-03	2.53E-02	none	No TRV	**yes**
Explosives										
2,4,6-Trinitrotoluene	118-96-7	3.40E-01	4.60E+00	4.60E+00	1.40E-05	1.77E-07	1.42E-05	none	No TRV	**yes**

CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
SP_v = Sediment-to-plant uptake factor; vegetative
SP_r = Sediment-to-plant uptake factor; reproductive
CFv = correction factor dry wt to wet wet (0.15 for vegetative because 0.15 kg dry plant/kg wet plant)
CFr = correction factor dry wt to wet wet (0.9 for reproductive parts because 0.9 kg dry seeds/kg wet seeds)
ADD_P = Average daily dose; plant
I_P (kg/kgBW/d) = Plant ingestion rate for mallards = 6.2E-02
AUF = Area use factor

I_S (kg/kgBW/d) = Sediment ingestion rate for mallards = 1.9E-03
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
no = HQ was not >1
HQs in bold font are > 1

[a] SP = 0.5 x 0.15 x SP_V + 0.5 x 0.9 x SP_R, because duck's diet is assumed to be half vegetative parts and half seeds.

[b] AUF = 0.12 ha / 435 ha = 2.76E-04

Appendix Table R-75. Load Line 4 Main Stream Segment Upstream of Perimeter Road for Mink Exposed to Sediment COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	**CAS Registry Number**	**RME** (mg/kg)	**BSAF** (kg/kg)	**FCM**	**ADD_A** (mg/kgBW/d) RME x BASF x FCM x I_A x AUF[a]	**ADD_{Sed}** (mg/kgBW/d) RME x I_S x AUF[a]	**ADD_{total}** (mg/kgBW/d) ADD_A + ADD_{Sed}	**NOAEL TRV** (mg/kgBW/d)	**Site HQ** ADD_{total} / TRV	**COEC?**
Metals										
Cadmium	7440-43-9	2.50E-01	3.40E+00	1.00E+00	3.47E-05	0.00E+00	3.47E-05	7.38E-01	4.70E-05	no

CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
BSAF = Sediment-to-benthic invertebrate uptake factor
FCM = Food chain multiplier
ADD_A = Average daily dose; animal
I_A (kg/kgBW/d) = Animal ingestion rate for mink = 1.6E-01
AUF = Area use factor
[a] AUF = 0.12 ha / 470 ha = 2.55E-04

I_S (kg/kgBW/d) = Sediment ingestion rate for mink = 0
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-76. Load Line 4 Main Stream Segment Upstream of Perimeter Road for Great Blue Herons Exposed to Sediment COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	**CAS Registry Number**	**RME** (mg/kg)	**BSAF** (kg/kg)	**FCM**	**ADD_A** (mg/kgBW/d) RME x BASF x FCM x I_A x AUF[a]	**ADD_{Sed}** (mg/kgBW/d) RME x I_S x AUF[a]	**ADD_{total}** (mg/kgBW/d) ADD_A + ADD_{Sed}	**NOAEL TRV** (mg/kgBW/d)	**Site HQ** ADD_{total} / TRV	**COEC?**
Metals										
Cadmium	7440-43-9	2.50E-01	3.40E+00	1.00E+00	3.06E-02	0.00E+00	3.06E-02	1.45E-02	**2.11E+00**	**yes**

CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
BSAF = Sediment-to-benthic invertebrate uptake factor
FCM = Food chain multiplier
ADD_A = Average daily dose; animal
I_A (kg/kgBW/d) = Animal ingestion rate for heron = 1.8E-01
AUF = Area use factor

[a] AUF = 0.12 ha / 0.6 ha = 2.00E-01

I_S (kg/kgBW/d) = Sediment ingestion rate for heron = 0
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-77. Load Line 4 Main Stream Segment and Settling Pond Aggregate Hazard Quotients for Sediment Biota Exposed to Sediment COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/kg)	NOAEL TRV (mg/kg)	Site HQ (RME/TRV)	COEC?
Metals					
Aluminum	7429-90-5	1.62E+04	none	No TRV	**yes**
Barium	7440-39-3	1.57E+02	none	No TRV	**yes**
Cadmium	7440-43-9	9.46E-01	9.90E-01	9.55E-01	no
Calcium	7440-70-2	5.81E+03	none	No TRV	**yes**
Iron	7439-89-6	3.94E+04	none	No TRV	**yes**
Lead	7439-92-1	2.72E+01	3.58E+01	7.60E-01	no
Magnesium	7439-95-4	4.22E+03	none	No TRV	**yes**
Mercury	7487-94-7	1.22E-01	1.80E-01	6.79E-01	no
Nickel	7440-02-0	3.34E+01	2.27E+01	1.47E+00	**yes**
Thallium	7440-28-0	2.70E+00	none	No TRV	**yes**
Vanadium	7440-62-2	2.70E+01	none	No TRV	**yes**
Explosives					
2,4,6-Trinitrotoluene	118-96-7	3.10E-01	none	No TRV	**yes**

CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-78. Load Line 4 Main Stream Segment and Settling Pond Aggregate for Muskrats Exposed to Sediment COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/kg)	SP_v (kg/kg)	ADD_P (mg/kgBW/d) RME x SP_v x CF x I_P x AUF[a]	ADD_{Sed} (mg/kgBW/d) RME x I_S x AUF[a]	ADD_{total} (mg/kgBW/d) ADD_P + ADD_{Sed}	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Metals									
Aluminum	7429-90-5	1.62E+04	4.00E-03	2.92E+00	0.00E+00	2.92E+00	7.72E-01	**3.78E+00**	**yes**
Barium	7440-39-3	1.57E+02	1.50E-01	1.06E+00	0.00E+00	1.06E+00	3.95E+00	2.68E-01	no
Cadmium	7440-43-9	9.46E-01	5.50E-01	2.34E-02	0.00E+00	2.34E-02	7.13E-01	3.28E-02	no
Calcium	7440-70-2	5.81E+03	3.50E+00	9.14E+02	0.00E+00	9.14E+02	none	No TRV	**yes**
Iron	7439-89-6	3.94E+04	4.00E-03	7.09E+00	0.00E+00	7.09E+00	none	No TRV	**yes**
Lead	7439-92-1	2.72E+01	4.50E-02	5.51E-02	0.00E+00	5.51E-02	5.92E+00	9.32E-03	no
Magnesium	7439-95-4	4.22E+03	1.00E+00	1.90E+02	0.00E+00	1.90E+02	none	No TRV	**yes**
Mercury	7487-94-7	1.22E-01	9.00E-01	4.95E-03	0.00E+00	4.95E-03	9.71E-01	5.10E-03	no
Nickel	7440-02-0	3.34E+01	6.00E-02	9.02E-02	0.00E+00	9.02E-02	2.96E+01	3.05E-03	no
Thallium	7440-28-0	2.70E+00	4.00E-03	4.86E-04	0.00E+00	4.86E-04	5.53E-03	8.79E-02	no
Vanadium	7440-62-2	2.70E+01	5.50E-03	6.68E-03	0.00E+00	6.68E-03	1.44E-01	4.64E-02	no
Explosives									
2,4,6-Trinitrotoluene	118-96-7	3.10E-01	4.60E+00	6.42E-02	0.00E+00	6.42E-02	1.18E+00	5.43E-02	no

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
SP_v = Sediment-to-plant uptake factor; vegetative
CF = correction factor dry wt to wet wet [(0.15) because 0.15 kg dry plant/kg wet plant]
ADD_P = Average daily dose; plant
I_P (kg/kgBW/d) = Plant ingestion rate for muskrats = 3.0E-01
AUF = Area use factor
[a] Home range is smaller than EU, therefore, AUF = 1.00E+00

ADD_{Sed} = Average daily dose; sediment
I_S (kg/kgBW/d) = Sediment ingestion rate for muskrats = 0
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-79. Load Line 4 Main Stream Segment and Settling Pond Aggregate for Mallard Ducks Exposed to Sediment COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/kg)	SP_v (kg/kg)	SPr (kg/kg)	ADD_P (mg/kgBW/d) RME x (0.5 x SP_v x CFv + 0.5 x SPr x CFr) x I_P x AUF[a,b]	ADD_{Sed} (mg/kgBW/d) RME x I_S x AUF[b]	ADD_{total} (mg/kgBW/d) ADD_P + ADD_{Sed}	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Metals										
Aluminum	7429-90-5	1.62E+04	4.00E-03	6.50E-04	2.05E-03	1.06E-01	1.08E-01	1.10E+00	9.83E-02	no
Barium	7440-39-3	1.57E+02	1.50E-01	1.50E-01	2.63E-03	1.02E-03	3.65E-03	2.08E-01	1.75E-02	no
Cadmium	7440-43-9	9.46E-01	5.50E-01	1.50E-01	2.19E-05	6.16E-06	2.81E-05	1.45E+00	1.94E-05	no
Calcium	7440-70-2	5.81E+03	3.50E+00	3.50E-01	5.19E-01	3.78E-02	5.57E-01	none	No TRV	**yes**
Iron	7439-89-6	3.94E+04	4.00E-03	1.00E-03	6.29E-03	2.57E-01	2.63E-01	none	No TRV	**yes**
Lead	7439-92-1	2.72E+01	4.50E-02	9.00E-03	4.30E-05	1.77E-04	2.20E-04	1.13E-02	1.95E-02	no
Magnesium	7439-95-4	4.22E+03	1.00E+00	5.50E-01	2.90E-01	2.75E-02	3.17E-01	none	No TRV	**yes**
Mercury	7487-94-7	1.22E-01	9.00E-01	2.00E-01	4.10E-06	7.97E-07	4.90E-06	4.50E-03	1.09E-03	no
Nickel	7440-02-0	3.34E+01	6.00E-02	6.00E-02	2.24E-04	2.18E-04	4.42E-04	7.74E+01	5.71E-06	no
Thallium	7440-28-0	2.70E+00	4.00E-03	4.00E-04	2.76E-07	1.76E-05	1.79E-05	none	No TRV	**yes**
Vanadium	7440-62-2	2.70E+01	5.50E-03	3.00E-03	1.01E-05	1.76E-04	1.86E-04	1.14E+01	1.64E-05	no
Explosives										
2,4,6-Trinitrotoluene	118-96-7	3.10E-01	4.60E+00	4.60E+00	1.59E-04	2.02E-06	1.61E-04	none	No TRV	**yes**

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
SP_v = Sediment-to-plant uptake factor; vegetative
SP_r = Sediment-to-plant uptake factor; reproductive
CFv = correction factor dry wt to wet wet (0.15 for vegetative because 0.15 kg dry plant/kg wet plant)
CFr = correction factor dry wt to wet wet (0.9 for reproductive parts because 0.9 kg dry seeds/kg wet seeds)
ADD_P = Average daily dose; plant
I_P (kg/kgBW/d) = Plant ingestion rate for mallards = 6.2E-02
AUF = Area use factor
ADD_{Sed} = Average daily dose; sediment
I_S (kg/kgBW/d) = Sediment ingestion rate for mallards = 1.9E-03
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
no = HQ was not >1
HQs in bold font are > 1

[a] SP = 0.5 x 0.15 x SP_V + 0.5 x 0.9 x SP_R, because duck's diet is assumed to be half vegetative parts and half seeds.

[b] AUF = 1.5 ha / 435 ha = 3.45E-03

Appendix Table R-80. Load Line 4 Main Stream Segment and Settling Pond Aggregate for Mink Exposed to Sediment COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	**CAS Registry Number**	**RME** (mg/kg)	**BSAF** (kg/kg)	**FCM**	**ADD_A** (mg/kgBW/d) RME x BSAF x FCM x I_A x AUF[a]	**ADD_{Sed}** (mg/kgBW/d) RME x I_S x AUF[a]	**ADD_{total}** (mg/kgBW/d) ADD_A + ADD_{Sed}	**NOAEL TRV** (mg/kgBW/d)	**Site HQ** ADD_{total} / TRV	**COEC?**
Metals										
Cadmium	7440-43-9	9.46E-01	3.40E+00	1.00E+00	1.64E-03	0.00E+00	1.64E-03	7.38E-01	2.22E-03	no
Lead	7439-92-1	2.72E+01	6.30E-01	1.00E+00	8.76E-03	0.00E+00	8.76E-03	6.12E+00	1.43E-03	no
Mercury	7487-94-7	1.22E-01	6.80E-02	1.00E+00	4.25E-06	0.00E+00	4.25E-06	1.01E+00	4.23E-06	no

CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
BSAF = Sediment-to-benthic invertebrate uptake factor
FCM = Food chain multiplier
ADD_A = Average daily dose; animal
I_A (kg/kgBW/d) = Animal ingestion rate for mink = 1.6E-01
AUF = Area use factor
[a] AUF = 1.5 ha / 470 ha = 3.19E-03

I_S (kg/kgBW/d) = Sediment ingestion rate for mink = 0
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-81. Load Line 4 Main Stream Segment and Settling Pond Aggregate for Great Blue Herons Exposed to Sediment COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	**CAS Registry Number**	**RME** (mg/kg)	**BSAF** (kg/kg)	**FCM**	**ADD_A** (mg/kgBW/d) RME x BASF x FCM x I_A x AUF[a]	**ADD_{Sed}** (mg/kgBW/d) RME x I_S x AUF[a]	**ADD_{total}** (mg/kgBW/d) ADD_A + ADD_{Sed}	**NOAEL TRV** (mg/kgBW/d)	**Site HQ** ADD_{total} / TRV	**COEC?**
Metals										
Cadmium	7440-43-9	9.5E-01	3.40E+00	1.00E+00	5.79E-01	0.00E+00	5.79E-01	1.45E-02	**3.99E+01**	**yes**
Lead	7439-92-1	2.7E+01	6.30E-01	1.00E+00	3.09E+00	0.00E+00	3.09E+00	1.13E-02	**2.73E+02**	**yes**
Mercury	7487-94-7	1.2E-01	6.80E-02	1.00E+00	1.50E-03	0.00E+00	1.50E-03	4.50E-03	3.33E-01	no

CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
BSAF = Sediment-to-benthic invertebrate uptake factor
FCM = Food chain multiplier
ADD_A = Average daily dose; animal
I_A (kg/kgBW/d) = Animal ingestion rate for heron = 1.8E-01
AUF = Area use factor

I_S (kg/kgBW/d) = Sediment ingestion rate for heron = 0
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

[a] Home range is smaller than EU, therefore, AUF = 1.00E+00

Appendix Table R-82. Load Line 4 Exit Drainages Aggregate
Hazard Quotients for Sediment Biota Exposed to Sediment COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	**CAS Registry Number**	**RME** (mg/kg)	**NOAEL TRV** (mg/kg)	**Site HQ** (RME/TRV)	**COEC?**
Metals					
Cadmium	7440-43-9	3.60E-01	9.90E-01	3.64E-01	no
Pesticides/PCBs					
Aroclor 1248	12672-29-6	9.00E-02	3.41E-01	2.64E-01	no

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-83. Load Line 4 Exit Drainages Aggregate Hazard Quotients for Muskrats Exposed to Sediment COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/kg)	SP_v (kg/kg)	ADD_P (mg/kgBW/d) RME x SP_V x CF x I_P x AUF[a]	ADD_{Sed} (mg/kgBW/d) RME x I_S x AUF[a]	ADD_{total} (mg/kgBW/d) ADD_P + ADD_{Sed}	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Metals									
Cadmium	7440-43-9	3.60E-01	5.50E-01	8.91E-03	0.00E+00	8.91E-03	7.13E-01	1.25E-02	no
Pesticides/PCBs									
Aroclor 1248	12672-29-6	9.00E-02	8.38E-03	3.40E-05	0.00E+00	3.40E-05	1.44E-02	2.36E-03	no

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
SP_v = Sediment-to-plant uptake factor; vegetative
CF = correction factor dry wt to wet wet [(0.15) because 0.15 kg dry plant/kg wet plant]
ADD_P = Average daily dose; plant
I_P (kg/kgBW/d) = Plant ingestion rate for muskrats = 3.0E-01
AUF = Area use factor
[a] Home range is smaller than EU, therefore, AUF = 1.00E+00

ADD_{Sed} = Average daily dose; sediment
I_S (kg/kgBW/d) = Sediment ingestion rate for muskrats = 0
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"

"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-84. Load Line 4 Exit Drainages Aggregate Hazard Quotients for Mallard Ducks Exposed to Sediment COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/kg)	SP_v (kg/kg)	SPr (kg/kg)	ADD_P (mg/kgBW/d) RME x (0.5 x SP_v x CFv + 0.5 x SPr x CFr) x I_P x AUF[a,b]	ADD_{Sed} (mg/kgBW/d) RME x I_S x AUF[b]	ADD_{total} (mg/kgBW/d) ADD_P + ADD_{Sed}	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Metals										
Cadmium	7440-43-9	3.60E-01	5.50E-01	1.50E-01	2.44E-06	6.88E-07	3.13E-06	1.45E+00	2.16E-06	no
Pesticides/PCBs										
Aroclor 1248	12672-29-6	9.00E-02	8.38E-03	8.38E-03	2.47E-08	1.72E-07	1.97E-07	none	No TRV	**yes**

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
SP_v = Sediment-to-plant uptake factor; vegetative
SP_r = Sediment-to-plant uptake factor; reproductive
CFv = correction factor dry wt to wet wet (0.15 for vegetative because 0.15 kg dry plant/kg wet plant)
CFr = correction factor dry wt to wet wet (0.9 for reproductive parts because 0.9 kg dry seeds/kg wet seeds)
ADD_P = Average daily dose; plant
I_P (kg/kgBW/d) = Plant ingestion rate for mallards = 6.2E-02
AUF = Area use factor

ADD_{Sed} = Average daily dose; sediment
I_S (kg/kgBW/d) = Sediment ingestion rate for mallards = 1.9E-03
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
no = HQ was not >1
HQs in bold font are > 1

[a] SP = 0.5 x 0.15 x SP_V + 0.5 x 0.9 x SP_R, because duck's diet is assumed to be half vegetative parts and half seeds.

[b] AUF = 0.44 ha / 435 ha = 1.01E-03

Appendix Table R-85. Load Line 4 Exit Drainages Aggregate Hazard Quotients for Mink Exposed to Sediment COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	**CAS Registry Number**	**RME** (mg/kg)	**BSAF** (kg/kg)	**FCM**	**ADD_A** (mg/kgBW/d) RME x BASF x FCM x I_A x AUF[a]	**ADD_{Sed}** (mg/kgBW/d) RME x I_S x AUF[a]	**ADD_{total}** (mg/kgBW/d) ADD_A + ADD_{Sed}	**NOAEL TRV** (mg/kgBW/d)	**Site HQ** ADD_{total} / TRV	**COEC?**
Metals										
Cadmium	7440-43-9	3.60E-01	3.40E+00	1.00E+00	1.83E-04	0.00E+00	1.83E-04	7.38E-01	2.48E-04	no
Pesticides/PCBs										
Aroclor 1248	12672-29-6	9.00E-02	4.21E-04	2.20E+01	1.25E-07	0.00E+00	1.25E-07	1.49E-02	8.39E-06	no

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
BSAF = Sediment-to-benthic invertebrate uptake factor
FCM = Food chain multiplier
ADD_A = Average daily dose; animal
I_A (kg/kgBW/d) = Animal ingestion rate for mink = 1.6E-01
AUF = Area use factor
[a] AUF = 0.44 ha / 470 ha = 9.36E-04

ADD_{Sed} = Average daily dose; sediment
I_S (kg/kgBW/d) = Sediment ingestion rate for mink = 0
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-86. Load Line 4 Exit Drainages Aggregate Hazard Quotients for Great Blue Herons Exposed to Sediment COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/kg)	BSAF (kg/kg)	FCM	ADD_A (mg/kgBW/d) RME x BASF x FCM x I_A x AUF[a]	ADD_{Sed} (mg/kgBW/d) RME x I_S x AUF[a]	ADD_{total} (mg/kgBW/d) ADD_A + ADD_{Sed}	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Metals										
Cadmium	7440-43-9	3.60E-01	3.40E+00	1.00E+00	1.62E-01	0.00E+00	1.62E-01	1.45E-02	1.11E+01	**yes**
Pesticides/PCBs										
Aroclor 1248	12672-29-6	9.00E-02	4.21E-04	2.20E+01	1.10E-04	0.00E+00	1.10E-04	none	No TRV	**yes**

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
BSAF = Sediment-to-benthic invertebrate uptake factor
FCM = Food chain multiplier
ADD_A = Average daily dose; animal
I_A (kg/kgBW/d) = Animal ingestion rate for heron = 1.8E-01
AUF = Area use factor

ADD_{Sed} = Average daily dose; sediment
I_S (kg/kgBW/d) = Sediment ingestion rate for heron = 0
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

[a] AUF = 0.44 ha / 0.6 ha = 7.33E-01

Appendix Table R-87. Load Line 4 Main Stream Segment Upstream of Perimeter Road Hazard Quotients for Aquatic Biota Exposed to Surface Water COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/L)	NOAEL TRV (mg/L)	Site HQ (RME/TRV)	COEC?
Metals					
Cadmium	7440-43-9	3.00E-04	2.20E-03	1.36E-01	no
Calcium	7440-70-2	6.20E+01	1.16E+02	5.34E-01	no
Iron	7439-89-6	4.60E+00	1.00E+00	**4.60E+00**	**yes**
Magnesium	7439-95-4	1.70E+01	8.20E+01	2.07E-01	no
Manganese	7439-96-5	3.60E+00	1.20E-01	**3.00E+01**	**yes**
Mercury	7487-94-6	7.80E-05	9.10E-03	8.57E-03	no
Potassium	7440-09-7	3.30E+00	5.30E+01	6.23E-02	no

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-88. Load Line 4 Main Stream Segment Upstream of Perimeter Road Hazard Quotients for Muskrats Exposed to Surface Water COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/L)	WP (L/kg)	ADD_P (mg/kgBW/d) RME x WP x I_P x AUF[a]	ADD_W (mg/kgBW/d) RME x IR_W x AUF[a]	ADD_{total} (mg/kgBW/d) ADD_P + ADDw	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Metals									
Cadmium	7440-43-9	3.00E-04	7.82E+02	6.50E-02	2.71E-04	6.52E-02	7.13E-01	9.15E-02	no
Calcium	7440-70-2	6.20E+01	No Value	none	5.61E+01	5.61E+01	none	No TRV	**yes**
Iron	7439-89-6	4.60E+00	No Value	none	4.16E+00	4.16E+00	none	No TRV	**yes**
Magnesium	7439-95-4	1.70E+01	No Value	none	1.54E+01	1.54E+01	none	No TRV	**yes**
Manganese	7439-96-5	3.60E+00	No Value	none	3.26E+00	3.26E+00	6.51E+01	5.01E-02	no
Mercury	7487-94-6	7.80E-05	2.48E+04	5.35E-01	7.06E-05	5.35E-01	9.71E-01	5.51E-01	no
Potassium	7440-09-7	3.30E+00	No Value	none	2.99E+00	2.99E+00	none	No TRV	**yes**

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
WP = Sediment-to-plant uptake factor; vegetative
CF = correction factor dry wt to wet wet (0.15 for vegetative because 0.15 kg dry plant/kg wet plant)
ADD_P = Average daily dose; plant
I_P (kg/kgBW/d) = Plant ingestion rate for muskrats = 3.0E-01
AUF = Area use factor
[a] AUF = 0.12 ha / 0.13 ha = 9.23E-01

ADD_W = Average daily dose; water
IR_W (L/kgBW/d) = Water ingestion rate for muskrats = 9.8E-01
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-89. Load Line 4 Main Stream Segment Upstream of Perimeter Road Hazard Quotients for Mallard Ducks Exposed to Surface Water COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	**CAS Registry Number**	**RME** (mg/L)	**WP** (L/kg)	**ADD_P** (mg/kgBW/d) RME x WP x I_P x AUF[a]	**ADD_W** (mg/kgBW/d) RME x IR_W x AUF[a]	**ADD_{total}** (mg/kgBW/d) ADD_P + ADDw	**NOAEL TRV** (mg/kgBW/d)	**Site HQ** ADD_{total} / TRV	**COEC?**
Metals									
Cadmium	7440-43-9	3.00E-04	7.82E+02	4.00E-06	4.72E-09	4.00E-06	1.45E+00	2.76E-06	no
Calcium	7440-70-2	6.20E+01	No Value	none	9.75E-04	9.75E-04	none	No TRV	**yes**
Iron	7439-89-6	4.60E+00	No Value	none	7.23E-05	7.23E-05	none	No TRV	**yes**
Magnesium	7439-95-4	1.70E+01	No Value	none	2.67E-04	2.67E-04	none	No TRV	**yes**
Manganese	7439-96-5	3.60E+00	No Value	none	5.66E-05	5.66E-05	9.77E+00	5.79E-06	no
Mercury	7487-94-6	7.80E-05	2.48E+04	3.29E-05	1.23E-09	3.29E-05	4.50E-03	7.31E-03	no
Potassium	7440-09-7	3.30E+00	No Value	none	5.19E-05	5.19E-05	none	No TRV	**yes**

EU = Exposure unit

CAS = Chemical abstract service

COPEC = Constituents of potential ecological concern

ESV = ecological screening value

RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)

WP = Sediment-to-plant uptake factor; vegetative

CF = correction factor dry wt to wet wet (0.15 for vegetative because 0.15 kg dry plant/kg wet plant)

ADD_P = Average daily dose; plant

I_P (kg/kgBW/d) = Plant ingestion rate for mallards = 6.2E-02

AUF = Area use factor

[a] AUF = 0.12 ha / 435 ha = 2.76E-04

ADD_W = Average daily dose; water

IR_W (L/kgBW/d) = Water ingestion rate for mallards = 5.7E-02

ADD_{total} = Average daily dose; total

NOAEL = lowest observed adverse effect level

TRV (mg/kgBW/d) = toxicity reference value

HQ = hazard quotient

COEC = contaminant of ecological concern

"yes" = HQ > 1 or "No TRV"

"no" = HQ was not >1

HQs in **bold font** are > 1

Appendix Table R-90. Load Line 4 Main Stream Segment Upstream of Perimeter Road Hazard Quotients for Mink Exposed to Surface Water COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	**CAS Registry Number**	**RME** (mg/L)	**BCF** (L/kg)	**FCM**	**ADD_A** (mg/kgBW/d) RME x BCF x FCM x I_A x AUF[a]	**ADD_W** (mg/kgBW/d) RME x IR_W x AUF[a]	**ADD_{total}** (mg/kgBW/d) ADD_A + ADD_W	**NOAEL TRV** (mg/kgBW/d)	**Site HQ** ADD_{total} / TRV	**COEC?**
Metals										
Cadmium	7440-43-9	3.00E-04	9.07E+02	1.00E+00	1.11E-05	6.05E-09	1.11E-05	7.38E-01	1.51E-05	no

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
BCF = Water-to-aquatic biota uptake factor
FCM = Food chain multiplier
ADD_A = Average daily dose; animal
I_A (kg/kgBW/d) = Animal ingestion rate for mink = 1.6E-01
AUF = Area use factor

ADD_W = Average daily dose; water
IR_W (L/kgBW/d) = Water ingestion rate for mink = 7.9E-02
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

[a] AUF = 0.12 ha / 470 ha = 2.55E-04

Appendix Table R-91. Load Line 4 Main Stream Segment Upstream of Perimeter Road Hazard Quotients for Great Blue Herons Exposed to Surface Water COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/L)	BCF (L/kg)	FCM	ADD_A (mg/kgBW/d) RME x BCF x FCM x I_A x AUF[a]	ADD_W (mg/kgBW/d) RME x IR_W x AUF[a]	ADD_{total} (mg/kgBW/d) ADD_A + ADD_W	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Metals										
Cadmium	7440-43-9	3.00E-04	9.07E+02	1.00E+00	9.80E-03	2.70E-06	9.80E-03	1.45E-02	6.76E-01	no

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
BCF = Water-to-aquatic biota uptake factor
FCM = Food chain multiplier
ADD_A = Average daily dose; animal
I_A (kg/kgBW/d) = Animal ingestion rate for heron = 1.8E-01
AUF = Area use factor

[a] AUF = 0.12 ha / 0.6 ha = 2.00E-01

ADD_W = Average daily dose; water
IR_W (L/kgBW/d) = Water ingestion rate for heron = 4.5E-02
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-92. Load Line 4 Main Stream Segment and Settling Pond Aggregate Hazard Quotients for Aquatic Biota Exposed to Surface Water COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	**CAS Registry Number**	**RME** (mg/L)	**NOAEL TRV** (mg/L)	**Site HQ** (RME/TRV)	**COEC?**
Metals					
Mercury	7439-97-6	9.20E-05	9.10E-03	1.01E-02	no
Pesticides/PCBs					
4,4'-DDT	50-29-3	3.10E-04	1.10E-08	**2.82E+04**	**yes**

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-93. Load Line 4 Main Stream Segment and Settling Pond Aggregate Hazard Quotients for Muskrats Exposed to Surface Water COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/L)	WP (L/kg)	ADD_P (mg/kgBW/d) RME x WP x I_P x AUF[a]	ADD_W (mg/kgBW/d) RME x IR_W x AUF[a]	ADD_{total} (mg/kgBW/d) ADD_P + ADDw	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Metals									
Mercury	7439-97-6	9.20E-05	2.48E+04	6.83E-01	9.02E-05	6.84E-01	9.71E-01	7.04E-01	no
Pesticides/PCBs									
4,4'-DDT	50-29-3	3.10E-04	1.13E+04	1.05E+00	3.04E-04	1.05E+00	5.92E-01	**1.77E+00**	yes

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
WP = Sediment-to-plant uptake factor; vegetative
CF = correction factor dry wt to wet wet (0.15 for vegetative because 0.15 kg dry plant/kg wet plant)
ADD_P = Average daily dose; plant
I_P (kg/kgBW/d) = Plant ingestion rate for muskrats = 3.0E-01
AUF = Area use factor
[a] Home range is smaller than EU, therefore, AUF = 1.00E+00

ADD_W = Average daily dose; water
IR_W (L/kgBW/d) = Water ingestion rate for muskrats = 9.8E-01
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-94. Load Line 4 Main Stream Segment and Settling Pond Aggregate Hazard Quotients for Mallard Ducks Exposed to Surface Water COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/L)	WP (L/kg)	ADD_P (mg/kgBW/d) RME x WP x I_P x AUF[a]	ADD_W (mg/kgBW/d) RME x IR_W x AUF[a]	ADD_{total} (mg/kgBW/d) ADD_P + ADDw	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Metals									
Mercury	7439-97-6	9.20E-05	2.48E+04	4.85E-04	1.81E-08	4.85E-04	4.50E-03	1.08E-01	no
Pesticides/PCBs									
4,4'-DDT	50-29-3	3.10E-04	1.13E+04	7.43E-04	6.09E-08	7.43E-04	2.80E-05	**2.65E+01**	yes

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
WP = Sediment-to-plant uptake factor; vegetative
CF = correction factor dry wt to wet wet (0.15 for vegetative because
0.15 kg dry plant/kg wet
ADD_P = Average daily dose; ADD_P = Average daily dose; plant
I_P (kg/kgBW/d) = Plant ingestion rate for mallards = 6.2E-02
AUF = Area use factor
[a] AUF = 1.5 ha / 435 ha = 3.45E-03

ADD_W = Average daily dose; water
IR_W (L/kgBW/d) = Water ingestion rate for mallards = 5.7E-02
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-95. Load Line 4 Main Stream Segment and Settling Pond Aggregate Hazard Quotients for Mink Exposed to Surface Water COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/L)	BCF (L/kg)	FCM	ADD_A (mg/kgBW/d) RME x BCF x FCM x I_A x AUF[a]	ADD_W (mg/kgBW/d) RME x IR_W x AUF[a]	ADD_{total} (mg/kgBW/d) ADD_A + ADD_W	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Metals										
Mercury	7439-97-6	9.20E-05	3.53E+03	1.00E+00	1.66E-04	2.32E-08	1.66E-04	1.01E+00	1.65E-04	no
Pesticides/PCBs										
4,4'-DDT	50-29-3	3.10E-04	1.71E+04	1.80E+01	4.88E-02	0.00E+00	4.88E-02	6.12E-01	7.98E-02	no

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
BCF = Water-to-aquatic biota uptake factor
FCM = Food chain multiplier
ADD_A = Average daily dose; animal
I_A (kg/kgBW/d) = Animal ingestion rate for mink = 1.6E-01
AUF = Area use factor

[a] AUF = 1.5 ha / 470 ha = 3.19E-03

ADD_W = Average daily dose; water
IR_W (L/kgBW/d) = Water ingestion rate for mink = 7.9E-02
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-96. Load Line 4 Main Stream Segment and Settling Pond Aggregate Hazard Quotients for Great Blue Herons Exposed to Surface Water COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/L)	BCF (L/kg)	FCM	ADD_A (mg/kgBW/d) RME x BCF x FCM x I_A x AUF[a]	ADD_W (mg/kgBW/d) RME x IR_W x AUF[a]	ADD_{total} (mg/kgBW/d) ADD_A + ADD_W	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Metals										
Mercury	7439-97-6	9.20E-05	3.53E+03	1.00E+00	5.85E-02	4.14E-06	5.85E-02	4.50E-03	**1.30E+01**	**yes**
Pesticides/PCBs										
4,4'-DDT	50-29-3	3.10E-04	1.71E+04	1.80E+01	1.72E+01	1.40E-05	1.72E+01	2.80E-05	**6.15E+05**	**yes**

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
BCF = Water-to-aquatic biota uptake factor
FCM = Food chain multiplier
ADD_A = Average daily dose; animal
I_A (kg/kgBW/d) = Animal ingestion rate for heron = 1.8E-01
AUF = Area use factor

ADD_W = Average daily dose; water
IR_W (L/kgBW/d) = Water ingestion rate for heron = 4.5E-02
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

[a] Home range is smaller than EU, therefore, AUF = 1.00E+00

Appendix Table R-97. Load Line 4 Exit Drainages Aggregate Hazard Quotients for Aquatic Biota Exposed to Surface Water COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/L)	NOAEL TRV (mg/L)	Site HQ (RME/TRV)	COEC?
Metals					
Calcium	7440-70-2	5.30E+01	1.16E+02	4.57E-01	no
Magnesium	7439-95-4	1.20E+01	8.20E+01	1.46E-01	no

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

Appendix Table R-98. Load Line 4 Exit Drainages Aggregate for Muskrats Exposed to Surface Water COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	CAS Registry Number	RME (mg/L)	WP (L/kg)	ADD_P (mg/kgBW/d) RME x WP x I_P x AUF[a]	ADD_W (mg/kgBW/d) RME x IR_W x AUF[a]	ADD_{total} (mg/kgBW/d) ADD_P + ADDw	NOAEL TRV (mg/kgBW/d)	Site HQ ADD_{total} / TRV	COEC?
Metals									
Calcium	7440-70-2	5.30E+01	No Value	none	5.19E+01	5.19E+01	none	No TRV	**yes**
Magnesium	7439-95-4	1.20E+01	No Value	none	1.18E+01	1.18E+01	none	No TRV	**yes**

EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
WP = Sediment-to-plant uptake factor; vegetative
CF = correction factor dry wt to wet wet (0.15 for vegetative because 0.15 kg dry plant/kg wet plant)
ADD_P = Average daily dose; plant
AUF = Area use factor

ADD_W = Average daily dose; water
IR_W (L/kgBW/d) = Water ingestion rate for muskrats = 9.8E-01
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1

[a] Home range is smaller than EU, therefore, AUF = 1.00E+00

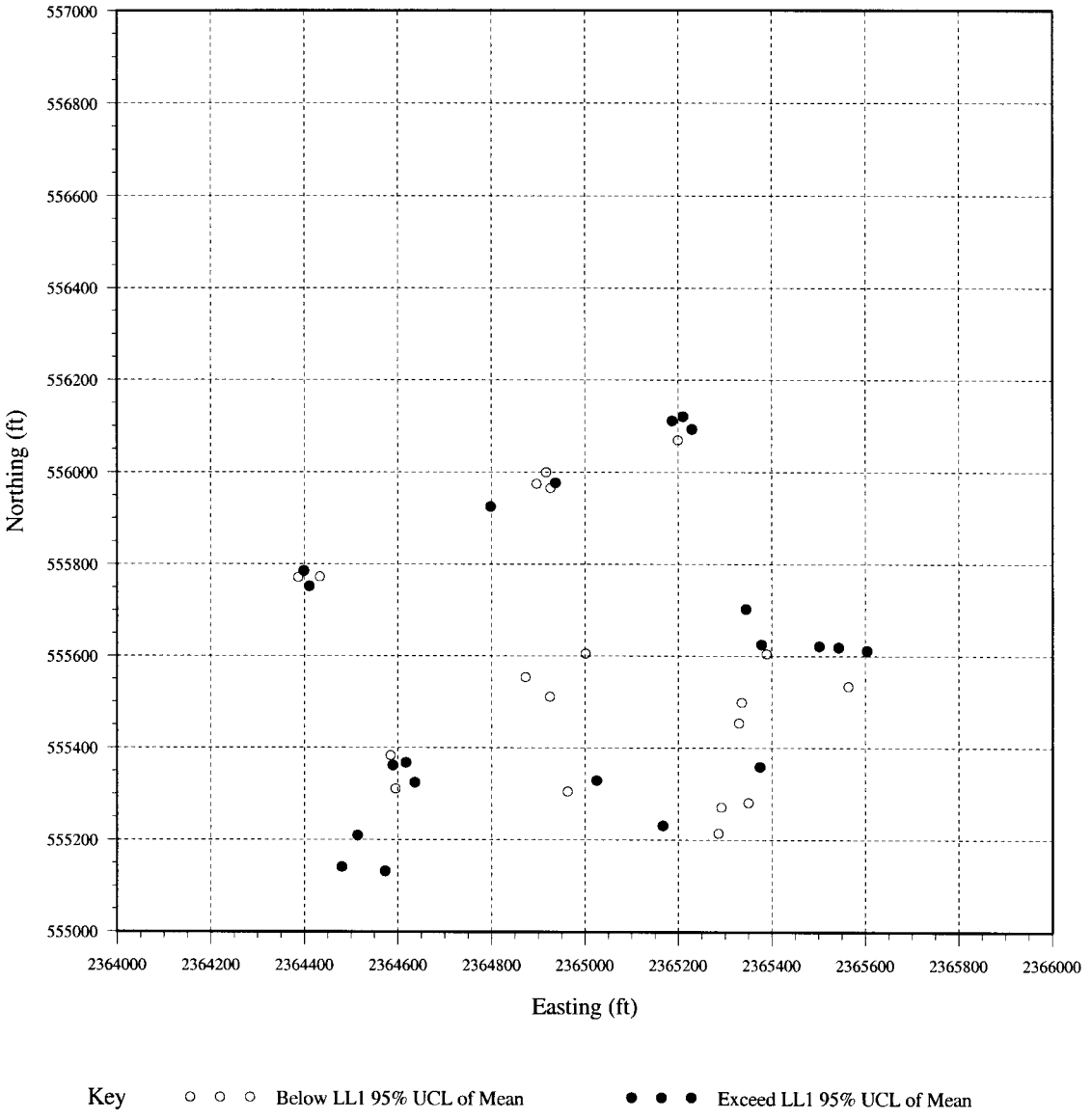
Appendix Table R-99. Load Line 4 Exit Drainages Aggregate Hazard Quotients for Mallard Ducks Exposed to Surface Water COPECs at Ravenna, Ohio.

Analytes carried forward from EU-specific ESV screen	**CAS Registry Number**	**RME** (mg/L)	**WP** (L/kg)	**ADD_P** (mg/kgBW/d) RME x WP x I_P x AUF[a]	**ADD_W** (mg/kgBW/d) RME x IR_W x AUF[a]	**ADD_{total}** (mg/kgBW/d) ADD_P + ADDw	**NOAEL TRV** (mg/kgBW/d)	**Site HQ** ADD_{total} / TRV	**COEC?**
Metals									
Calcium	7440-70-2	5.30E+01	No Value	none	1.38E-02	1.38E-02	none	No TRV	**yes**
Magnesium	7439-95-4	1.20E+01	No Value	none	3.11E-03	3.11E-03	none	No TRV	**yes**

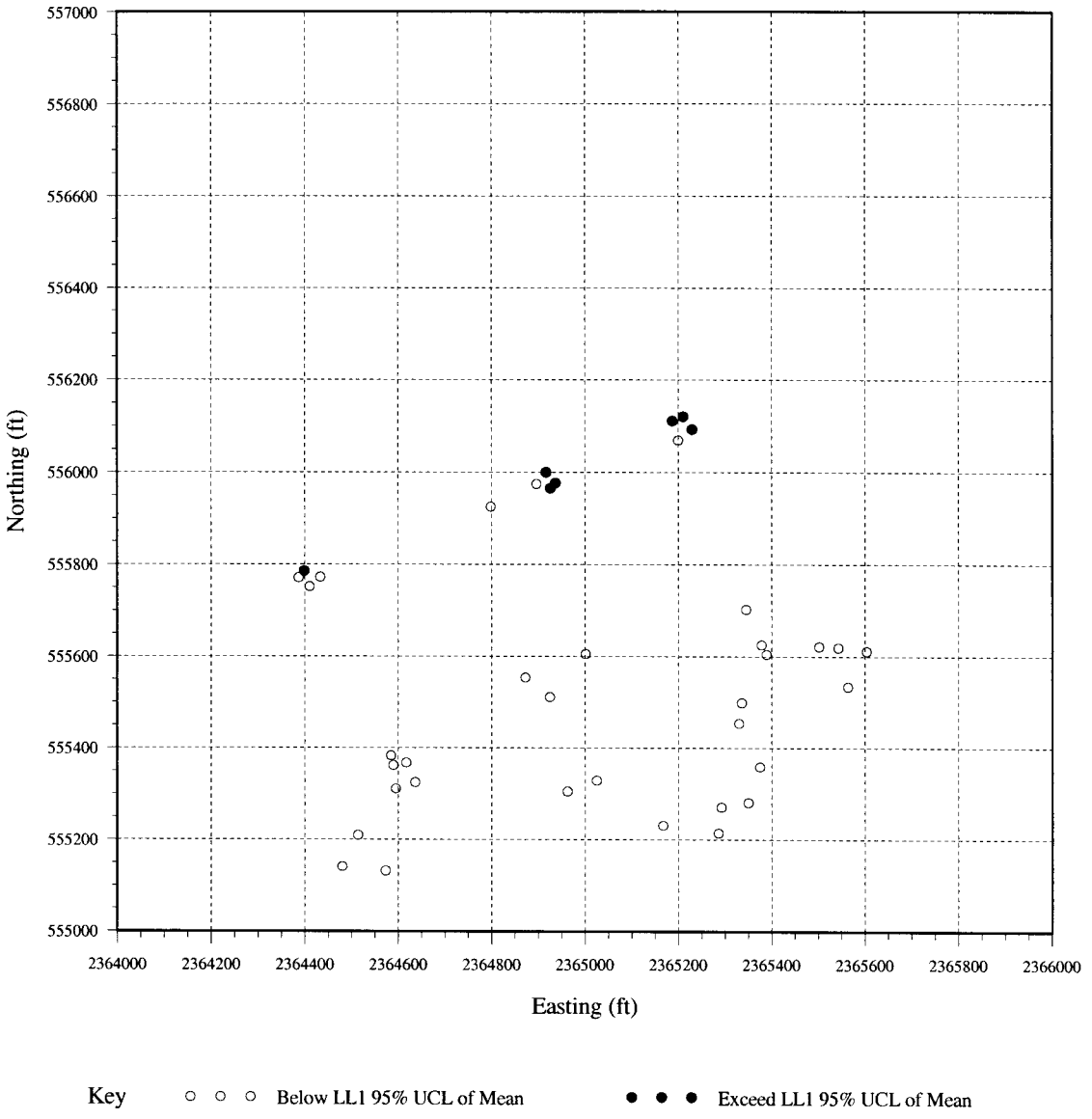
EU = Exposure unit
CAS = Chemical abstract service
COPEC = Constituents of potential ecological concern
ESV = ecological screening value
RME = Reasonable maximum exposure (lower of maximum or 95% UCL of mean)
WP = Sediment-to-plant uptake factor; vegetative
CF = correction factor dry wt to wet wet (0.15 for vegetative because 0.15 kg dry plant/kg wet plant)
ADD_P = Average daily dose; plant

[a] AUF = 0.44 ha / 435 ha = 4.55E-03

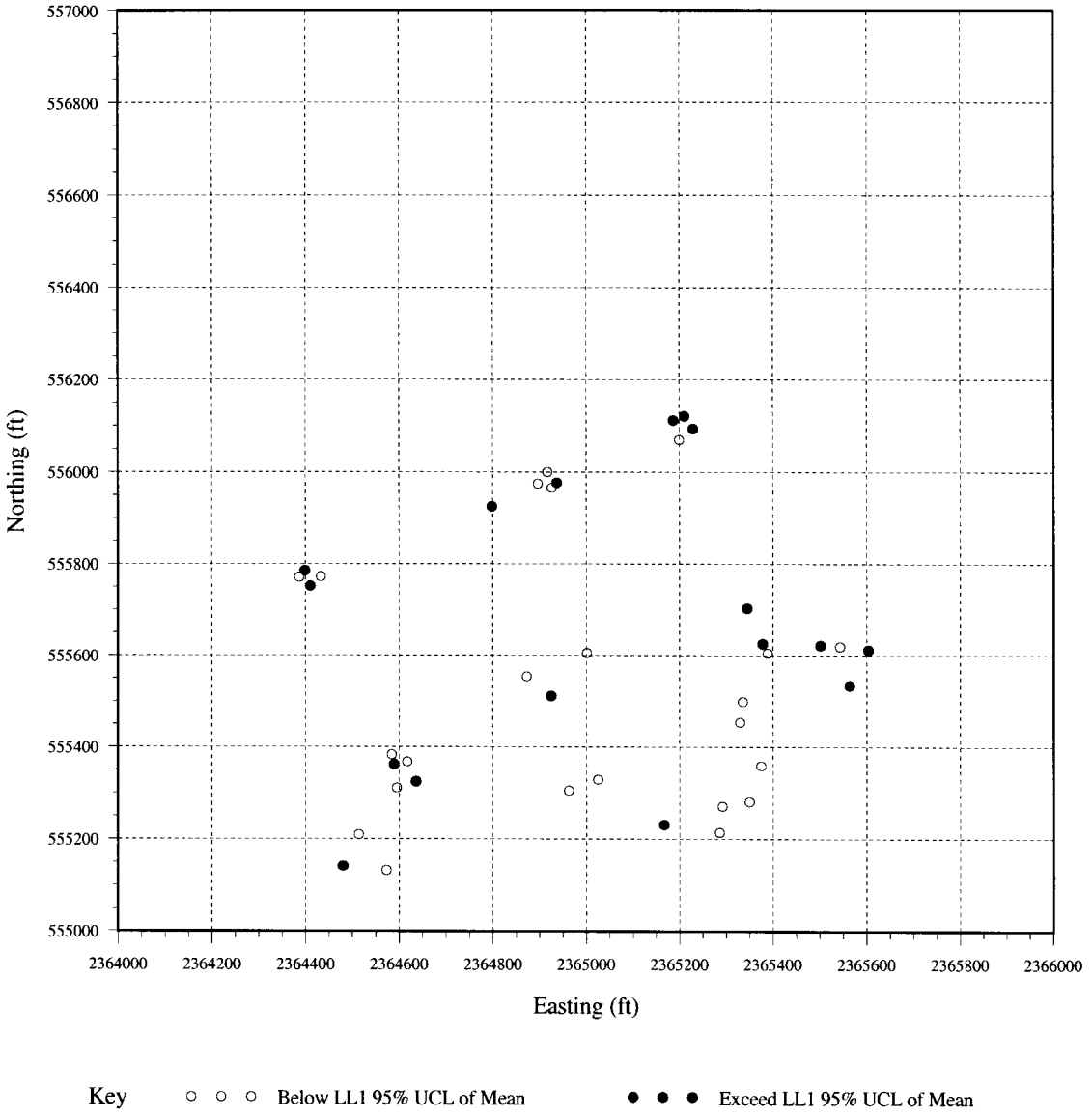
ADD_W = Average daily dose; water
IR_W (L/kgBW/d) = Water ingestion rate for mallards = 5.7E-02
ADD_{total} = Average daily dose; total
NOAEL = lowest observed adverse effect level
TRV (mg/kgBW/d) = toxicity reference value
HQ = hazard quotient
COEC = contaminant of ecological concern
"yes" = HQ > 1 or "No TRV"
"no" = HQ was not >1
HQs in **bold font** are > 1



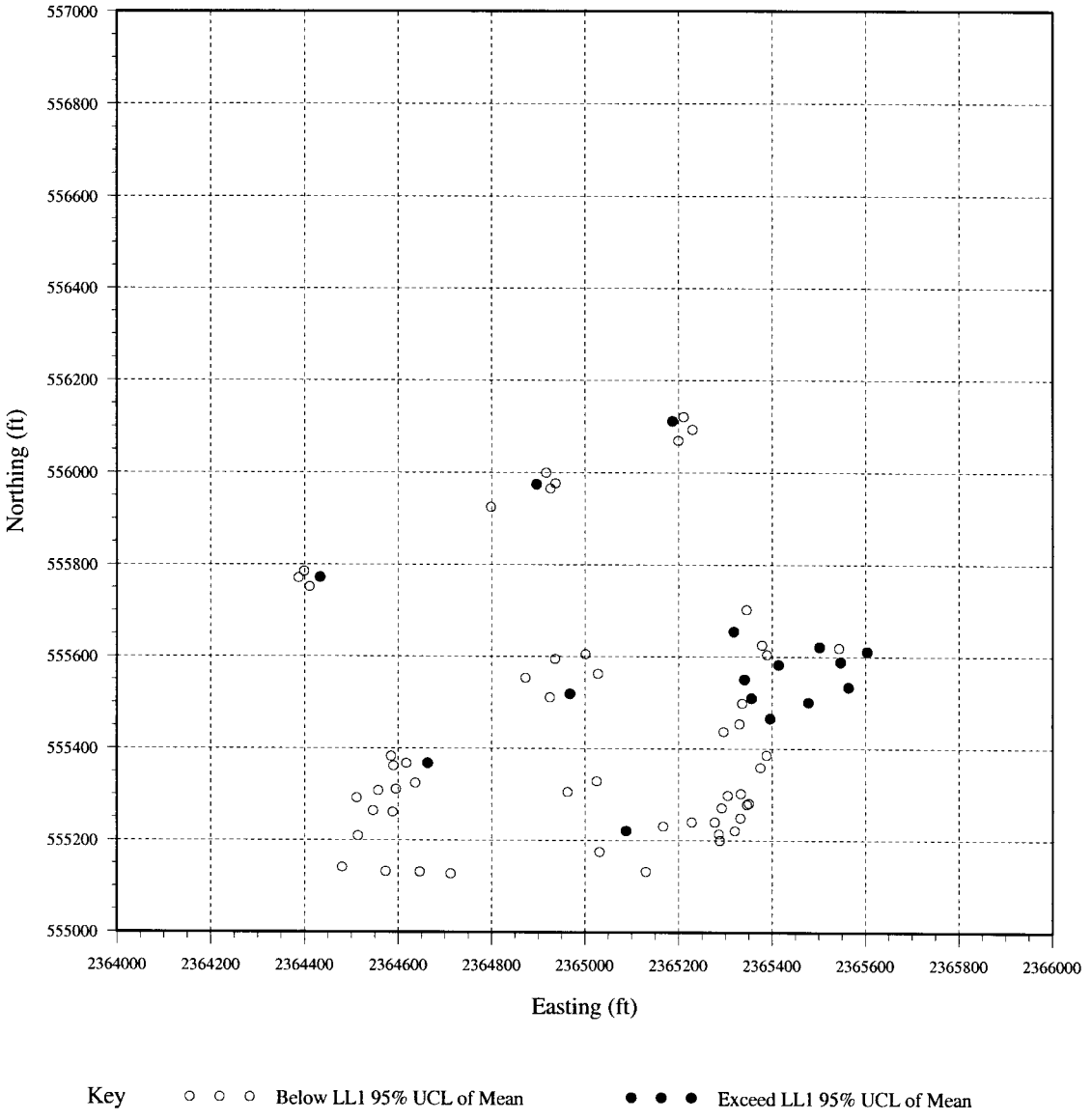
Appendix Figure R-1. Spatial Distribution of Beryllium at Explosives Handling Areas Aggregate at Load Line 4.



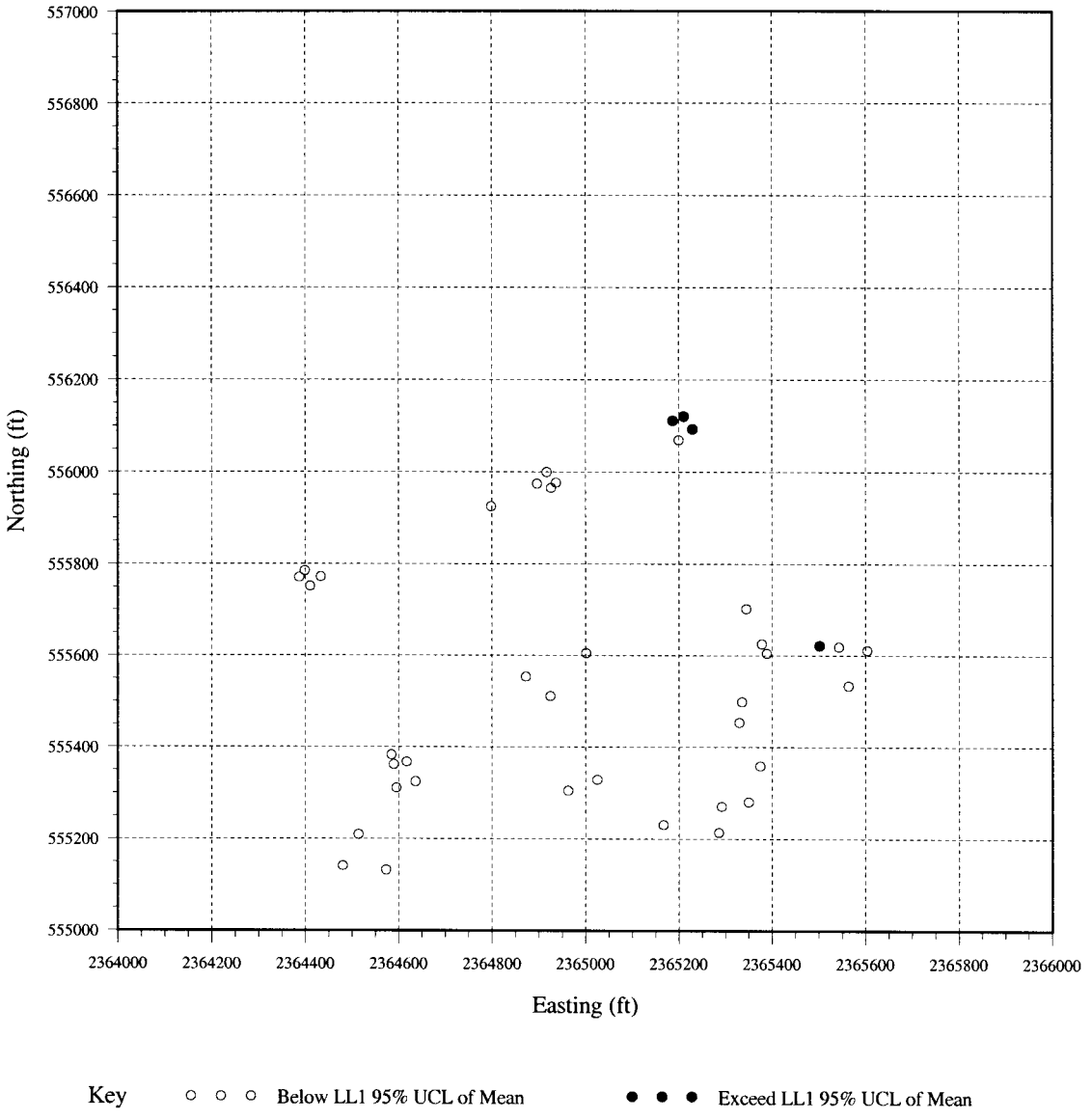
Appendix Figure R-2. Spatial Distribution of Calcium at Explosives Handling Areas Aggregate at Load Line 4.



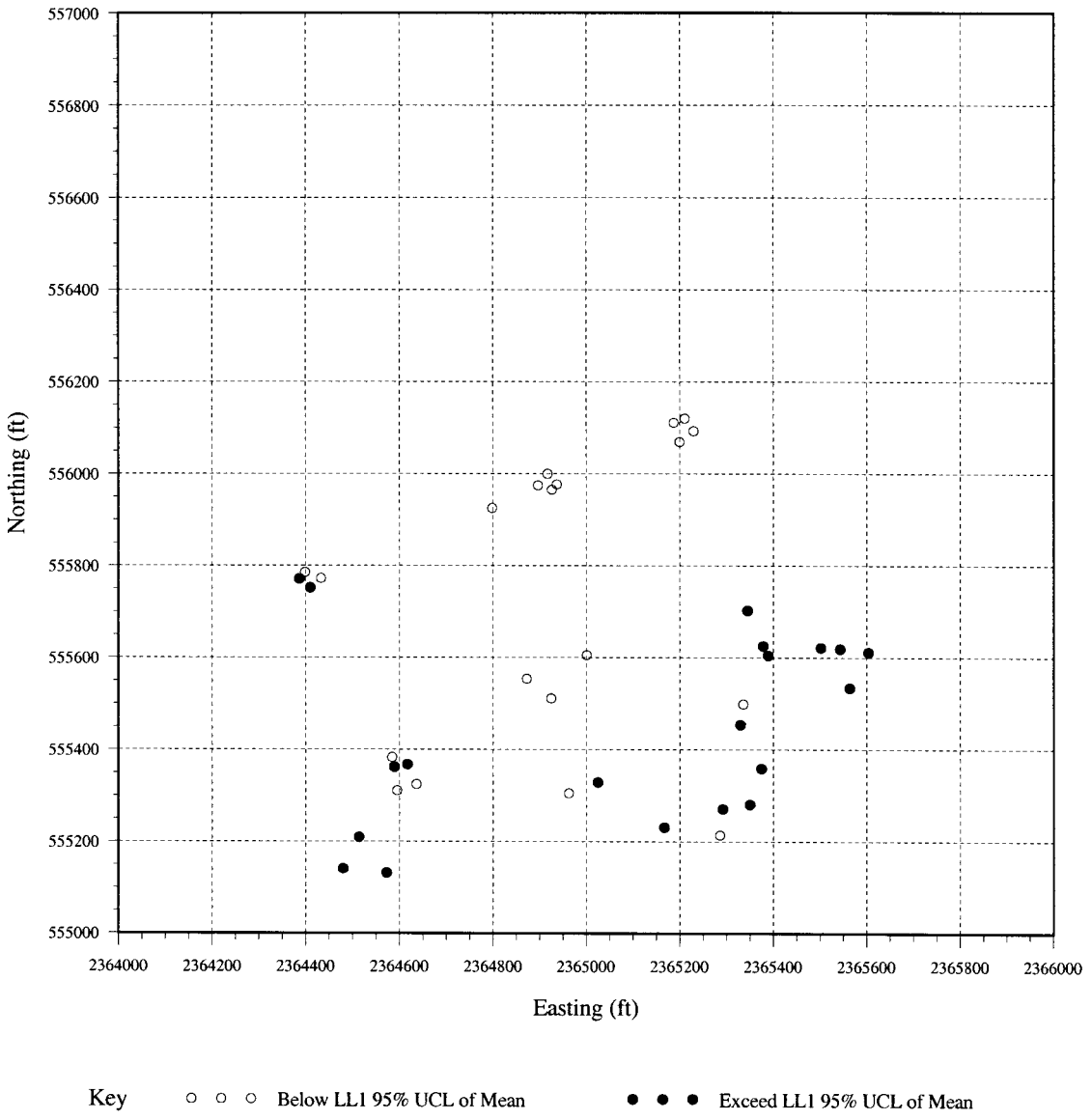
Appendix Figure R-3. Spatial Distribution of Magnesium at Explosives Handling Areas Aggregate at Load Line 4.



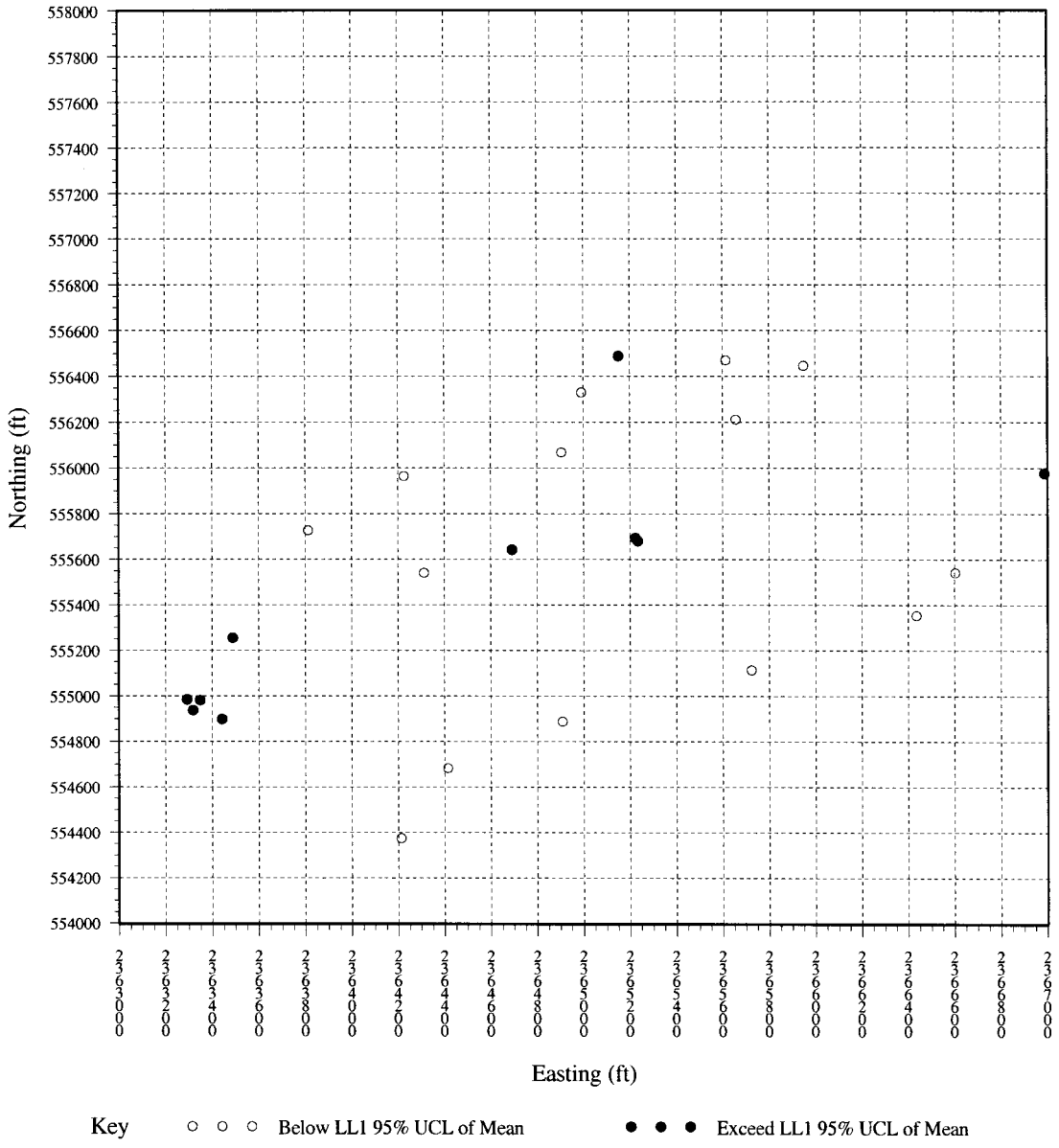
Appendix Figure R-4. Spatial Distribution of Selenium at Explosives Handling Areas Aggregate at Load Line 4.



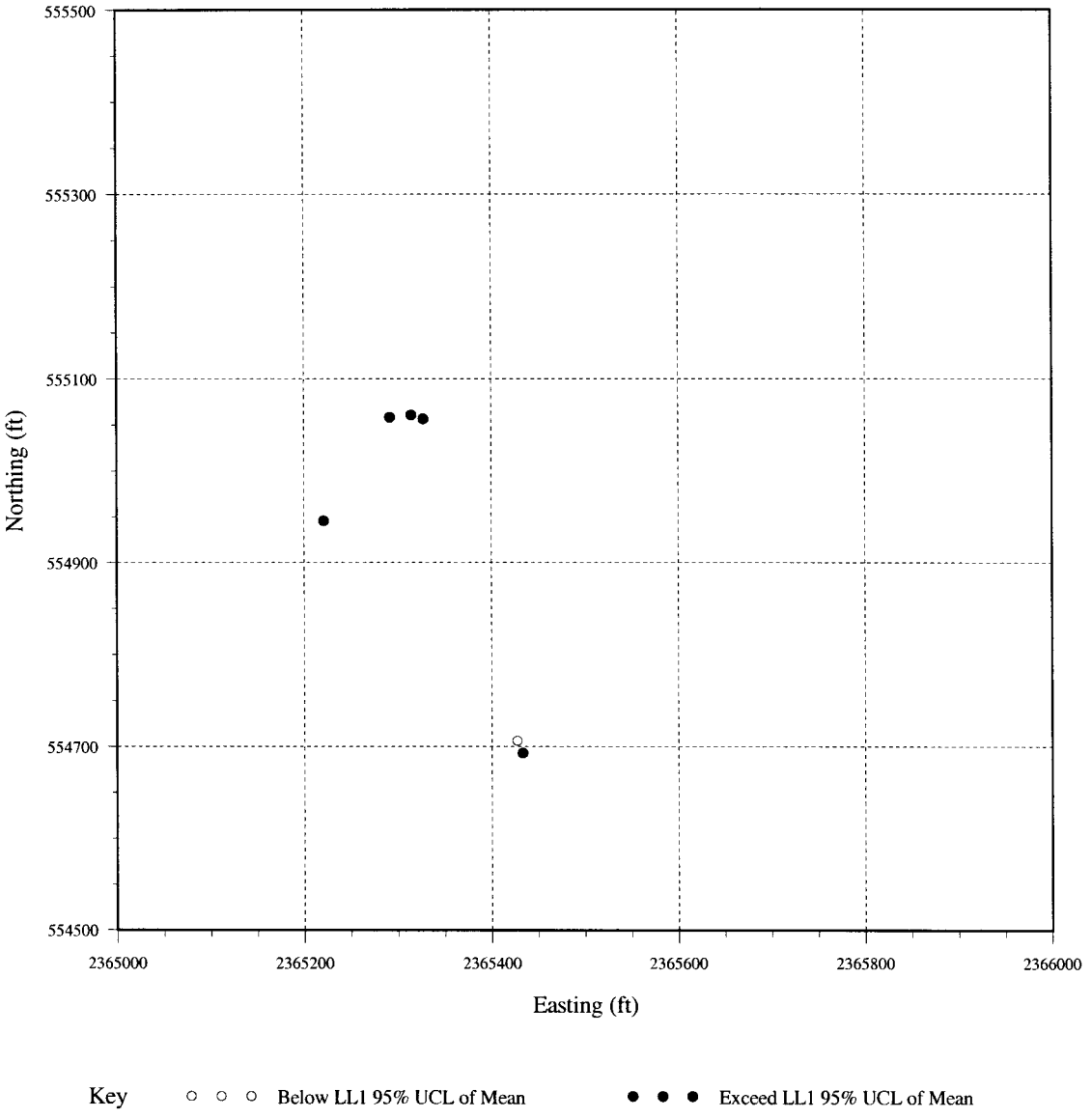
Appendix Figure R-5. Spatial Distribution of Sodium at Explosives Handling Areas Aggregate at Load Line 4.



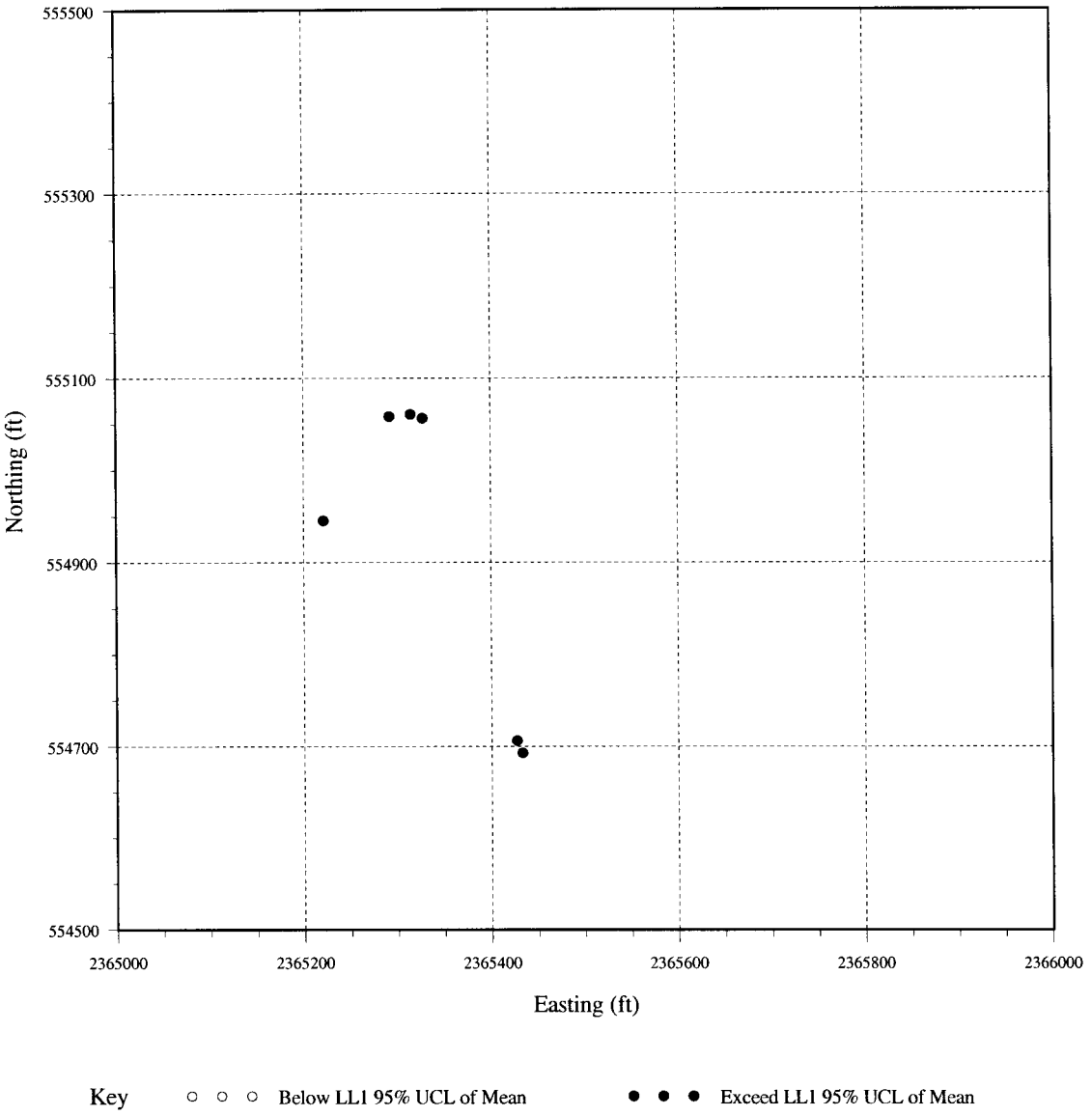
Appendix Figure R-6. Spatial Distribution of Thallium at Explosives Handling Areas Aggregate at Load Line 4.



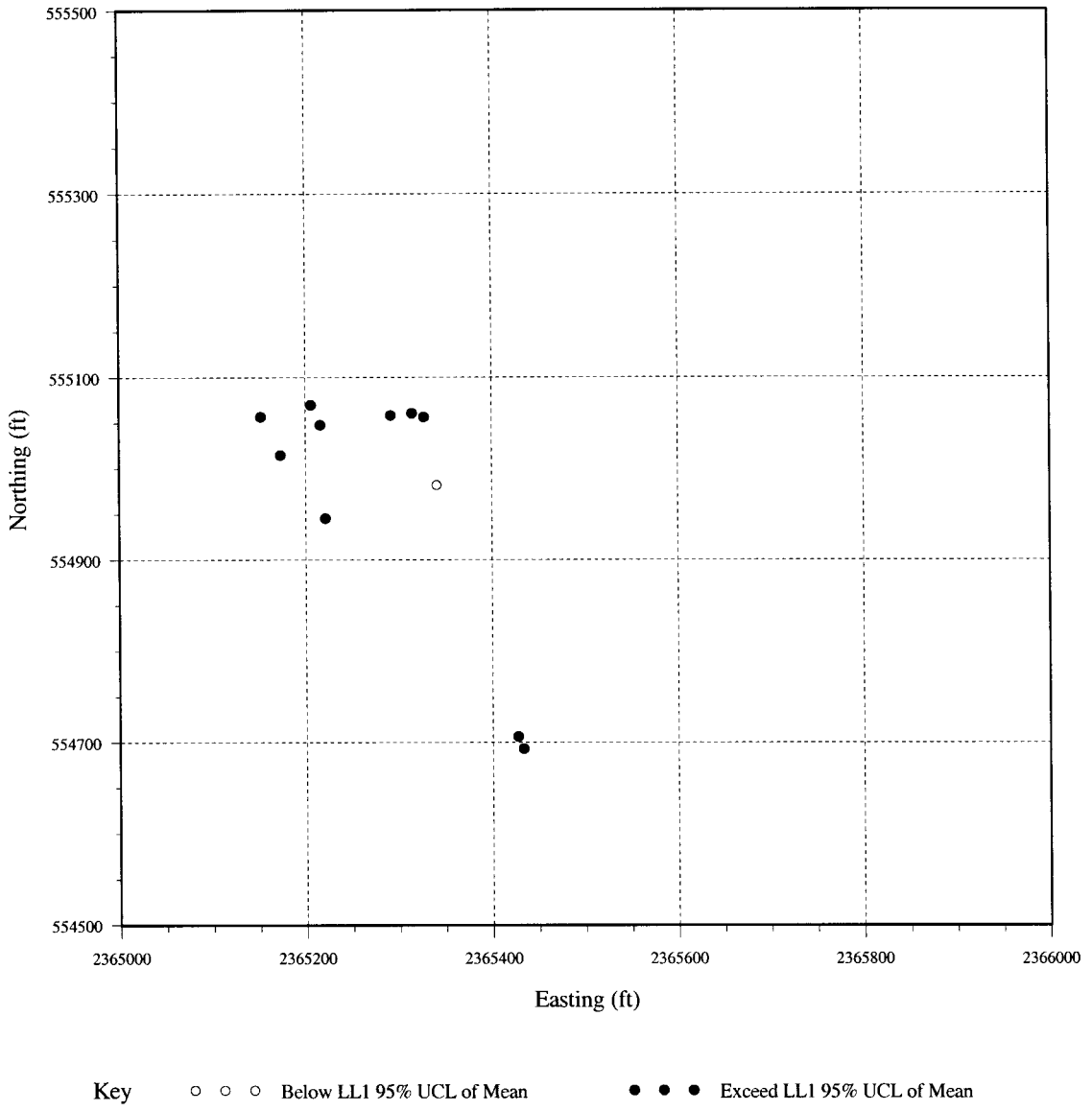
Appendix Figure R-7. Spatial Distribution of Lead at Perimeter Area Aggregate at Load Line 4.



Appendix Figure R-8. Spatial Distribution of Copper at Melt Pour Area Drainage Ditches Aggregate at Load Line 4.



Appendix Figure R-9. Spatial Distribution of Magnesium at Melt Pour Area Drainage Ditches Aggregate at Load Line 4.



Appendix Figure R-10. Spatial Distribution of Zinc at Melt Pour Area Drainage Ditches Aggregate at Load Line 4.