This document was too large to scan as a single document. It has been divided into smaller sections.

Section 7 of 14

Document Information			
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Table C2-4 Bioaccumulation Factors for Accumulation of COPCs and ROPCs from Water by Mammals and Birds

Constituent of Potential Concern	CAS Registry Number	Bioaccumulation Factor (BAF-T_w) ([mg/kg tissue]/[mg/L water])							
		Coyote[d]	Burrowing Owl[d]	Red-tailed Hawk[d]	Canada Goose[d]	Spotted Sandpiper[d]	Great Blue Heron[d]	Bald Eagle[d]	Mink[d]
Strontium	7440-24-6	2.95E-04	4.95E-06	1.80E-05	4.91E-05	2.10E-06	3.23E-05	4.05E-05	2.81E-05
Tantalum	7440-25-7	5.89E-04	9.90E-06	3.61E-05	9.82E-05	4.21E-06	6.45E-05	8.10E-05	5.61E-05
Thallium	7440-28-0	3.93E-02	6.60E-04	2.41E-03	6.55E-03	2.81E-04	4.30E-03	5.40E-03	3.74E-03
Tin	7440-31-5	7.85E-02	1.32E-03	4.81E-03	1.31E-02	5.61E-04	8.60E-03	1.08E-02	7.48E-03
Tungsten	7440-33-7	4.42E-02	7.43E-04	2.71E-03	7.37E-03	3.16E-04	4.84E-03	6.08E-03	4.21E-03
Uranium	7440-61-1	1.96E-04	3.30E-06	1.20E-05	3.27E-05	1.40E-06	2.15E-05	2.70E-05	1.87E-05
Vanadium	7440-62-2	2.45E-03	4.13E-05	1.50E-04	4.09E-04	1.75E-05	2.69E-04	3.38E-04	2.34E-04
Yttrium	7440-65-5	2.95E-04	4.95E-06	1.80E-05	4.91E-05	2.10E-06	3.23E-05	4.05E-05	2.81E-05
Zinc	7440-66-6	9.82E-02	1.65E-03	6.01E-03	1.64E-02	7.01E-04	1.08E-02	1.35E-02	9.35E-03
Zirconium	7440-67-7	5.40E-03	9.08E-05	3.31E-04	9.00E-04	3.86E-05	5.92E-04	7.43E-04	5.14E-04
Non-metals and Anions									
Ammonia/Ammonium	7664-41-7	1.91E-02	3.22E-04	1.17E-03	3.19E-03	1.37E-04	2.10E-03	2.63E-03	1.82E-03
Bromide	24959-67-9	2.45E-02	4.13E-04	1.50E-03	4.09E-03	1.75E-04	2.69E-03	3.38E-03	2.34E-03
Chloride	16887-00-6	7.85E-02	1.32E-03	4.81E-03	1.31E-02	5.61E-04	8.60E-03	1.08E-02	7.48E-03
Cyanide	57-12-5	1.91E-02	3.22E-04	1.17E-03	3.19E-03	1.37E-04	2.10E-03	2.63E-03	1.82E-03
Fluoride	16984-48-8	1.47E-01	2.48E-03	9.02E-03	2.46E-02	1.05E-03	1.61E-02	2.03E-02	1.40E-02
Hydroxide	14280-30-9	No data	No data	No data	No data	No data	No data	No data	No data
Iodine	7553-56-2	6.87E-03	1.16E-04	4.21E-04	1.15E-03	4.91E-05	7.53E-04	9.45E-04	6.55E-04
Nitrate	14797-55-8	7.36E-02	1.24E-03	4.51E-03	1.23E-02	5.26E-04	8.07E-03	1.01E-02	7.01E-03
Nitrite	14797-65-0	7.36E-02	1.24E-03	4.51E-03	1.23E-02	5.26E-04	8.07E-03	1.01E-02	7.01E-03
Phosphate	14265-44-2	5.40E-02	9.08E-04	3.31E-03	9.00E-03	3.86E-04	5.92E-03	7.43E-03	5.14E-03
Phosphorus	7723-14-0	5.40E-02	9.08E-04	3.31E-03	9.00E-03	3.86E-04	5.92E-03	7.43E-03	5.14E-03
Sulfate	14808-79-8	9.82E-02	1.65E-03	6.01E-03	1.64E-02	7.01E-04	1.08E-02	1.35E-02	9.35E-03
Total Sulfur	63705-05-5	9.82E-02	1.65E-03	6.01E-03	1.64E-02	7.01E-04	1.08E-02	1.35E-02	9.35E-03
Criteria Pollutants									
Carbon monoxide	630-08-0	1.91E-02	3.22E-04	1.17E-03	3.19E-03	1.37E-04	2.10E-03	2.63E-03	1.82E-03

Table C2-4 Bioaccumulation Factors for Accumulation of COPCs and ROPCs from Water by Mammals and Birds

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	Mammal Ba[b] ([mg/kg tissue] / [mg ingested /day])	Bird Ba[c] ([mg/kg tissue] / [mg ingested /day])	Bioaccumulation Factor (BAF-T_w) ([mg/kg tissue]/[mg/L water])			
					Mule Deer[d]	Mourning Dove[d]	Great Basin Pocket Mouse[d]	Western Meadow-lark[d]
Nitrogen dioxide	10102-44-0	NA	1.95E-02	1.95E-02	5.71E-02	2.90E-04	0.00E+00	2.38E-04
Ozone	10028-15-6	NA	1.95E-02	1.95E-02	5.71E-02	2.90E-04	0.00E+00	2.38E-04
Particulate matter	No CAS #	NA	NA	NA	No data	No data	No data	No data
Sulfur dioxide	7446-09-5	NA	1.95E-02	1.95E-02	5.71E-02	2.90E-04	0.00E+00	2.38E-04
Radionuclides								
All radionuclides combined (rad/d)i	No CAS #	NA	NA	NA	No data	No data	No data	No data
Actinium-227	14952-40-0	NA	2.50E-03	2.50E-03	7.32E-03	3.71E-05	0.00E+00	3.06E-05
Americium-241	14596-10-2	NA	3.50E-06	3.50E-06	1.02E-05	5.20E-08	0.00E+00	4.28E-08
Americium-243	14993-75-0	NA	3.50E-06	3.50E-06	1.02E-05	5.20E-08	0.00E+00	4.28E-08
Antimony-125	14234-35-6	NA	1.00E-03	1.00E-03	2.93E-03	1.48E-05	0.00E+00	1.22E-05
Barium-137m	13981-97-0	NA	1.50E-04	1.50E-04	4.39E-04	2.23E-06	0.00E+00	1.83E-06
Cadmium-113m	14336-66-4	NA	1.20E-04	1.20E-04	3.51E-04	1.78E-06	0.00E+00	1.47E-06
Carbon-14	14762-75-5	NA	NA	NA	No data	No data	No data	No data
Cesium-134	13967-70-9	NA	2.00E-02	2.00E-02	5.85E-02	2.97E-04	0.00E+00	2.44E-04
Cesium-137	10045-97-3	NA	2.00E-02	2.00E-02	5.85E-02	2.97E-04	0.00E+00	2.44E-04
Cobalt-60	10198-40-0	NA	2.00E-02	2.00E-02	5.85E-02	2.97E-04	0.00E+00	2.44E-04
Curium-242	15510-73-3	NA	3.50E-06	3.50E-06	1.02E-05	5.20E-08	0.00E+00	4.28E-08
Curium-243	15757-87-6	NA	3.50E-06	3.50E-06	1.02E-05	5.20E-08	0.00E+00	4.28E-08
Curium-244	13981-15-2	NA	3.50E-06	3.50E-06	1.02E-05	5.20E-08	0.00E+00	4.28E-08
Europium-152	14683-23-9	NA	5.00E-03	5.00E-03	1.46E-02	7.42E-05	0.00E+00	6.11E-05
Europium-154	15585-10-1	NA	5.00E-03	5.00E-03	1.46E-02	7.42E-05	0.00E+00	6.11E-05
Europium-155	14391-16-3	NA	5.00E-03	5.00E-03	1.46E-02	7.42E-05	0.00E+00	6.11E-05
Iodine-129	15046-84-1	NA	7.00E-03	7.00E-03	2.05E-02	1.04E-04	0.00E+00	8.55E-05
Neptunium-237	13994-20-2	NA	5.50E-03	5.50E-03	1.61E-02	8.17E-05	0.00E+00	6.72E-05
Nickel-59	14336-70-0	NA	6.00E-03	6.00E-03	1.76E-02	8.91E-05	0.00E+00	7.33E-05
Nickel-63	13981-37-8	NA	6.00E-03	6.00E-03	1.76E-02	8.91E-05	0.00E+00	7.33E-05

Table C2-4 Bioaccumulation Factors for Accumulation of COPCs and ROPCs from Water by Mammals and Birds

Constituent of Potential Concern	CAS Registry Number	Bioaccumulation Factor (BAF-T_w) ([mg/kg tissue]/[mg/L water])							
		Coyote[d]	Burrowing Owl[d]	Red-tailed Hawk[d]	Canada Goose[d]	Spotted Sandpiper[d]	Great Blue Heron[d]	Bald Eagle[d]	Mink[d]
Nitrogen dioxide	10102-44-0	1.91E-02	3.22E-04	1.17E-03	3.19E-03	1.37E-04	2.10E-03	2.63E-03	1.82E-03
Ozone	10028-15-6	1.91E-02	3.22E-04	1.17E-03	3.19E-03	1.37E-04	2.10E-03	2.63E-03	1.82E-03
Particulate matter	No CAS #	No data	No data	No data	No data	No data	No data	No data	No data
Sulfur dioxide	7446-09-5	1.91E-02	3.22E-04	1.17E-03	3.19E-03	1.37E-04	2.10E-03	2.63E-03	1.82E-03
Radionuclides									
All radionuclides combined (rad/d)i	No CAS #	No data	No data	No data	No data	No data	No data	No data	No data
Actinium-227	14952-40-0	2.45E-03	4.13E-05	1.50E-04	4.09E-04	1.75E-05	2.69E-04	3.38E-04	2.34E-04
Americium-241	14596-10-2	3.44E-06	5.78E-08	2.10E-07	5.73E-07	2.45E-08	3.76E-07	4.73E-07	3.27E-07
Americium-243	14993-75-0	3.44E-06	5.78E-08	2.10E-07	5.73E-07	2.45E-08	3.76E-07	4.73E-07	3.27E-07
Antimony-125	14234-35-6	9.82E-04	1.65E-05	6.01E-05	1.64E-04	7.01E-06	1.08E-04	1.35E-04	9.35E-05
Barium-137m	13981-97-0	1.47E-04	2.48E-06	9.02E-06	2.46E-05	1.05E-06	1.61E-05	2.03E-05	1.40E-05
Cadmium-113m	14336-66-4	1.18E-04	1.98E-06	7.22E-06	1.96E-05	8.42E-07	1.29E-05	1.62E-05	1.12E-05
Carbon-14	14762-75-5	No data	No data	No data	No data	No data	No data	No data	No data
Cesium-134	13967-70-9	1.96E-02	3.30E-04	1.20E-03	3.27E-03	1.40E-04	2.15E-03	2.70E-03	1.87E-03
Cesium-137	10045-97-3	1.96E-02	3.30E-04	1.20E-03	3.27E-03	1.40E-04	2.15E-03	2.70E-03	1.87E-03
Cobalt-60	10198-40-0	1.96E-02	3.30E-04	1.20E-03	3.27E-03	1.40E-04	2.15E-03	2.70E-03	1.87E-03
Curium-242	15510-73-3	3.44E-06	5.78E-08	2.10E-07	5.73E-07	2.45E-08	3.76E-07	4.73E-07	3.27E-07
Curium-243	15757-87-6	3.44E-06	5.78E-08	2.10E-07	5.73E-07	2.45E-08	3.76E-07	4.73E-07	3.27E-07
Curium-244	13981-15-2	3.44E-06	5.78E-08	2.10E-07	5.73E-07	2.45E-08	3.76E-07	4.73E-07	3.27E-07
Europium-152	14683-23-9	4.91E-03	8.25E-05	3.01E-04	8.18E-04	3.51E-05	5.38E-04	6.75E-04	4.68E-04
Europium-154	15585-10-1	4.91E-03	8.25E-05	3.01E-04	8.18E-04	3.51E-05	5.38E-04	6.75E-04	4.68E-04
Europium-155	14391-16-3	4.91E-03	8.25E-05	3.01E-04	8.18E-04	3.51E-05	5.38E-04	6.75E-04	4.68E-04
Iodine-129	15046-84-1	6.87E-03	1.16E-04	4.21E-04	1.15E-03	4.91E-05	7.53E-04	9.45E-04	6.55E-04
Neptunium-237	13994-20-2	5.40E-03	9.08E-05	3.31E-04	9.00E-04	3.86E-05	5.92E-04	7.43E-04	5.14E-04
Nickel-59	14336-70-0	5.89E-03	9.90E-05	3.61E-04	9.82E-04	4.21E-05	6.45E-04	8.10E-04	5.61E-04
Nickel-63	13981-37-8	5.89E-03	9.90E-05	3.61E-04	9.82E-04	4.21E-05	6.45E-04	8.10E-04	5.61E-04

Table C2-4 Bioaccumulation Factors for Accumulation of COPCs and ROPCs from Water by Mammals and Birds

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	Mammal Ba[b] ([mg/kg tissue] / [mg ingested /day])	Bird Ba[c] ([mg/kg tissue] / [mg ingested /day])	Bioaccumulation Factor (BAF-T_w) ([mg/kg tissue]/[mg/L water])			
					Mule Deer[d]	Mourning Dove[d]	Great Basin Pocket Mouse[d]	Western Meadow-lark[d]
Niobium-93m	7440-03-1[g]	NA	2.50E-01	2.50E-01	7.32E-01	3.71E-03	0.00E+00	3.06E-03
Plutonium-238	13981-16-3	NA	5.00E-07	5.00E-07	1.46E-06	7.42E-09	0.00E+00	6.11E-09
Plutonium-239	15117-48-3	NA	5.00E-07	5.00E-07	1.46E-06	7.42E-09	0.00E+00	6.11E-09
Plutonium-240	14119-33-6	NA	5.00E-07	5.00E-07	1.46E-06	7.42E-09	0.00E+00	6.11E-09
Plutonium-241	14119-32-5	NA	5.00E-07	5.00E-07	1.46E-06	7.42E-09	0.00E+00	6.11E-09
Plutonium-242	13982-10-0	NA	5.00E-07	5.00E-07	1.46E-06	7.42E-09	0.00E+00	6.11E-09
Protactinium-231	14331-85-2	NA	1.00E-05	1.00E-05	2.93E-05	1.48E-07	0.00E+00	1.22E-07
Radium-226	13982-63-3	NA	2.50E-04	2.50E-04	7.32E-04	3.71E-06	0.00E+00	3.06E-06
Radium-228	15262-20-1	NA	2.50E-04	2.50E-04	7.32E-04	3.71E-06	0.00E+00	3.06E-06
Ruthenium-106	13967-48-1	NA	2.00E-03	2.00E-03	5.85E-03	2.97E-05	0.00E+00	2.44E-05
Samarium-151	15715-94-3	NA	5.00E-03	5.00E-03	1.46E-02	7.42E-05	0.00E+00	6.11E-05
Selenium-79	15758-45-9	NA	1.50E-02	1.50E-02	4.39E-02	2.23E-04	0.00E+00	1.83E-04
Strontium-90	10098-97-2	NA	3.00E-04	3.00E-04	8.78E-04	4.45E-06	0.00E+00	3.67E-06
Technetium-99	14133-76-7	NA	8.50E-03	8.50E-03	2.49E-02	1.26E-04	0.00E+00	1.04E-04
Thorium-229	15594-54-4	NA	6.00E-06	6.00E-06	1.76E-05	8.91E-08	0.00E+00	7.33E-08
Thorium-232	7440-29-1	NA	6.00E-06	6.00E-06	1.76E-05	8.91E-08	0.00E+00	7.33E-08
Tin-126	15832-50-5	NA	8.00E-02	8.00E-02	2.34E-01	1.19E-03	0.00E+00	9.78E-04
Tritium	10028-17-8	NA	NA	NA	No data	No data	No data	No data
Uranium-232	14158-29-3	NA	2.00E-04	2.00E-04	5.85E-04	2.97E-06	0.00E+00	2.44E-06
Uranium-233	13968-55-3	NA	2.00E-04	2.00E-04	5.85E-04	2.97E-06	0.00E+00	2.44E-06
Uranium-234	13966-29-5	NA	2.00E-04	2.00E-04	5.85E-04	2.97E-06	0.00E+00	2.44E-06
Uranium-235	15117-96-1	NA	2.00E-04	2.00E-04	5.85E-04	2.97E-06	0.00E+00	2.44E-06
Uranium-236	13982-70-2	NA	2.00E-04	2.00E-04	5.85E-04	2.97E-06	0.00E+00	2.44E-06
Uranium-238	7440-61-1	NA	2.00E-04	2.00E-04	5.85E-04	2.97E-06	0.00E+00	2.44E-06
Yttrium-90	10098-91-6	NA	3.00E-04	3.00E-04	8.78E-04	4.45E-06	0.00E+00	3.67E-06
Zirconium-93	15751-77-6	NA	5.50E-03	5.50E-03	1.61E-02	8.17E-05	0.00E+00	6.72E-05

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Constituent of Potential Concern	CAS Registry Number	Bioaccumulation Factor (BAF-T_w) ([mg/kg tissue]/[mg/L water])							
		Coyote[d]	Burrowing Owl[d]	Red-tailed Hawk[d]	Canada Goose[d]	Spotted Sandpiper[d]	Great Blue Heron[d]	Bald Eagle[d]	Mink[d]
Niobium-93m	7440-03-1[g]	2.45E-01	4.13E-03	1.50E-02	4.09E-02	1.75E-03	2.69E-02	3.38E-02	2.34E-02
Plutonium-238	13981-16-3	4.91E-07	8.25E-09	3.01E-08	8.18E-08	3.51E-09	5.38E-08	6.75E-08	4.68E-08
Plutonium-239	15117-48-3	4.91E-07	8.25E-09	3.01E-08	8.18E-08	3.51E-09	5.38E-08	6.75E-08	4.68E-08
Plutonium-240	14119-33-6	4.91E-07	8.25E-09	3.01E-08	8.18E-08	3.51E-09	5.38E-08	6.75E-08	4.68E-08
Plutonium-241	14119-32-5	4.91E-07	8.25E-09	3.01E-08	8.18E-08	3.51E-09	5.38E-08	6.75E-08	4.68E-08
Plutonium-242	13982-10-0	4.91E-07	8.25E-09	3.01E-08	8.18E-08	3.51E-09	5.38E-08	6.75E-08	4.68E-08
Protactinium-231	14331-85-2	9.82E-06	1.65E-07	6.01E-07	1.64E-06	7.01E-08	1.08E-06	1.35E-06	9.35E-07
Radium-226	13982-63-3	2.45E-04	4.13E-06	1.50E-05	4.09E-05	1.75E-06	2.69E-05	3.38E-05	2.34E-05
Radium-228	15262-20-1	2.45E-04	4.13E-06	1.50E-05	4.09E-05	1.75E-06	2.69E-05	3.38E-05	2.34E-05
Ruthenium-106	13967-48-1	1.96E-03	3.30E-05	1.20E-04	3.27E-04	1.40E-05	2.15E-04	2.70E-04	1.87E-04
Samarium-151	15715-94-3	4.91E-03	8.25E-05	3.01E-04	8.18E-04	3.51E-05	5.38E-04	6.75E-04	4.68E-04
Selenium-79	15758-45-9	1.47E-02	2.48E-04	9.02E-04	2.46E-03	1.05E-04	1.61E-03	2.03E-03	1.40E-03
Strontium-90	10098-97-2	2.95E-04	4.95E-06	1.80E-05	4.91E-05	2.10E-06	3.23E-05	4.05E-05	2.81E-05
Technetium-99	14133-76-7	8.34E-03	1.40E-04	5.11E-04	1.39E-03	5.96E-05	9.14E-04	1.15E-03	7.95E-04
Thorium-229	15594-54-4	5.89E-06	9.90E-08	3.61E-07	9.82E-07	4.21E-08	6.45E-07	8.10E-07	5.61E-07
Thorium-232	7440-29-1	5.89E-06	9.90E-08	3.61E-07	9.82E-07	4.21E-08	6.45E-07	8.10E-07	5.61E-07
Tin-126	15832-50-5	7.85E-02	1.32E-03	4.81E-03	1.31E-02	5.61E-04	8.60E-03	1.08E-02	7.48E-03
Tritium	10028-17-8	No data	No data	No data	No data	No data	No data	No data	No data
Uranium-232	14158-29-3	1.96E-04	3.30E-06	1.20E-05	3.27E-05	1.40E-06	2.15E-05	2.70E-05	1.87E-05
Uranium-233	13968-55-3	1.96E-04	3.30E-06	1.20E-05	3.27E-05	1.40E-06	2.15E-05	2.70E-05	1.87E-05
Uranium-234	13966-29-5	1.96E-04	3.30E-06	1.20E-05	3.27E-05	1.40E-06	2.15E-05	2.70E-05	1.87E-05
Uranium-235	15117-96-1	1.96E-04	3.30E-06	1.20E-05	3.27E-05	1.40E-06	2.15E-05	2.70E-05	1.87E-05
Uranium-236	13982-70-2	1.96E-04	3.30E-06	1.20E-05	3.27E-05	1.40E-06	2.15E-05	2.70E-05	1.87E-05
Uranium-238	7440-61-1	1.96E-04	3.30E-06	1.20E-05	3.27E-05	1.40E-06	2.15E-05	2.70E-05	1.87E-05
Yttrium-90	10098-91-6	2.95E-04	4.95E-06	1.80E-05	4.91E-05	2.10E-06	3.23E-05	4.05E-05	2.81E-05
Zirconium-93	15751-77-6	5.40E-03	9.08E-05	3.31E-04	9.00E-04	3.86E-05	5.92E-04	7.43E-04	5.14E-04

Table C2-4 Bioaccumulation Factors for Accumulation of COPCs and ROPCs from Water by Mammals and Birds

Notes/Sources

NA = Not applicable.

[a] From Appendix B, Table B-1.

[b] Ingestion-to-tissue transfer factor (mg/kgBW per mg/d); from Table C2-1.

[c] Bird Ba is the same as the Mammal Ba multiplied by 0.8 for organic COPCs, and the same as Mammal Ba for inorganic COPCs and ROPCs.

[d] Ba × IR_W × BW for each receptor, where IR_W is the daily water ingestion rate (L/kgBW/d) and BW is the body weight (kg) of the receptor (Risk Assessment Work Plan section 8.1.3.3).

[e] Values for Aroclor-1254 were used for polychlorinated biphenyl mixtures.

[f] Values for Cr(VI) were used for calculations.

[g] Chemical Abstracts Service Registry number for niobium metal.

Table C2-5 Food Chain Multipliers for Bioaccumulation of COPCs and ROPCs by Mammals and Birds

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	FCM, Level 2[b]	FCM, Level 3[c]	FCM, Level 4[d]
Organic Compounds					
	Aromatic Halogenated Hydrocarbons				
2,3,4,6-Tetrachlorophenol	58-90-2	4.30	1.00E+00	1.50E+00	1.20E+00
4-Chloro-3-methylphenol	59-50-7	3.10	1.00E+00	1.00E+00	1.00E+00
	Aromatic Nonhalogenated Hydrocarbons				
2-Nitrotoluene	88-72-2	2.30	1.00E+00	1.00E+00	1.00E+00
4-Nitrobiphenyl	92-93-3	3.77	1.00E+00	1.20E+00	1.00E+00
Benzaldehyde	100-52-7	1.48	1.00E+00	1.00E+00	1.00E+00
Benzene	71-43-2	2.14	1.00E+00	1.00E+00	1.00E+00
Benzyl alcohol	100-51-6	1.10	1.00E+00	1.00E+00	1.00E+00
Ethyl benzene	100-41-4	3.12	1.00E+00	1.00E+00	1.00E+00
m-Xylene	108-38-3	3.20	1.00E+00	1.00E+00	1.00E+00
o-Xylene	95-47-6	3.13	1.00E+00	1.00E+00	1.00E+00
p-Xylene	106-42-3	3.17	1.00E+00	1.00E+00	1.00E+00
Styrene	100-42-5	2.93	1.00E+00	1.00E+00	1.00E+00
Toluene	108-88-3	2.67	1.00E+00	1.00E+00	1.00E+00
	Non-aromatic Nonhalogenated Hydrocarbons				
1,2-Epoxybutane	106-88-7	0.86	1.00E+00	1.00E+00	1.00E+00
1,3-Butadiene	106-99-0	1.99	1.00E+00	1.00E+00	1.00E+00
1,4-Dioxane	123-91-1	-0.27	1.00E+00	1.00E+00	1.00E+00
1-Methylpropyl alcohol	78-92-2	0.61	1.00E+00	1.00E+00	1.00E+00
1-Nitropropane	108-03-2	0.87	1.00E+00	1.00E+00	1.00E+00
2,2,4-Trimethylpentane	540-84-1	5.02	1.00E+00	3.20E+00	2.60E+00
2-Butanone	78-93-3	0.28	1.00E+00	1.00E+00	1.00E+00
2-Butenaldehyde (2-Butenal)	4170-30-3	0.55	1.00E+00	1.00E+00	1.00E+00
2-Ethoxyethanol	110-80-5	-0.10	1.00E+00	1.00E+00	1.00E+00
2-Heptanone	110-43-0	1.98	1.00E+00	1.00E+00	1.00E+00
2-Hexanone	591-78-6	1.38	1.00E+00	1.00E+00	1.00E+00
2-Methoxyethanol	109-86-4	-0.77	1.00E+00	1.00E+00	1.00E+00
2-Methyl-2-propanol	75-65-0	0.35	1.00E+00	1.00E+00	1.00E+00
2-Methyl-2-propenenitrile	126-98-7	0.54	1.00E+00	1.00E+00	1.00E+00
2-Methylaziridine	75-55-8	-0.60	1.00E+00	1.00E+00	1.00E+00
2-Methylpropyl alcohol	78-83-1	0.76	1.00E+00	1.00E+00	1.00E+00
2-Pentanone	107-87-9	0.91	1.00E+00	1.00E+00	1.00E+00
2-Propanone (Acetone)	67-64-1	-0.22	1.00E+00	1.00E+00	1.00E+00
2-Propene-1-ol	107-18-6	0.17	1.00E+00	1.00E+00	1.00E+00
2-Propyl alcohol	67-63-0	0.05	1.00E+00	1.00E+00	1.00E+00
3-Heptanone	106-35-4	No data	1.00E+00	No data	No data
3-Methyl-1-butanol	123-51-3	No data	1.00E+00	No data	No data
3-Methyl-2-butanone	563-80-4	No data	1.00E+00	No data	No data
3-Pentanone	96-22-0	0.99	1.00E+00	1.00E+00	1.00E+00
4-Heptanone	123-19-3	No data	1.00E+00	No data	No data

Table C2-5 Food Chain Multipliers for Bioaccumulation of COPCs and ROPCs by Mammals and Birds

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	FCM, Level 2[b]	FCM, Level 3[c]	FCM, Level 4[d]
4-Methyl-2-pentanone	108-10-1	1.19	1.00E+00	1.00E+00	1.00E+00
4-Methyl-3-penten-2-one	141-79-7	NA	1.00E+00	No data	No data
5-Methyl-2-hexanone	110-12-3	1.72	1.00E+00	1.00E+00	1.00E+00
Acetaldehyde	75-07-0	-0.22	1.00E+00	1.00E+00	1.00E+00
Acetamide	60-35-5	-1.26	1.00E+00	1.00E+00	1.00E+00
Acetic acid	64-19-7	-0.17	1.00E+00	1.00E+00	1.00E+00
Acetic acid ethyl ester	141-78-6	0.73	1.00E+00	1.00E+00	1.00E+00
Acetic acid n-butyl ester	123-86-4	1.73	1.00E+00	1.00E+00	1.00E+00
Acetonitrile	75-05-8	-0.34	1.00E+00	1.00E+00	1.00E+00
Acrolein	107-02-8	-0.01	1.00E+00	1.00E+00	1.00E+00
Acrylonitrile	107-13-1	0.25	1.00E+00	1.00E+00	1.00E+00
Bis(isopropyl)ether	108-20-3	1.56	1.00E+00	1.00E+00	1.00E+00
Butane	106-97-8	2.89	1.00E+00	1.00E+00	1.00E+00
Carbon disulfide	75-15-0	2.00	1.00E+00	1.00E+00	1.00E+00
Cyanogen	460-19-5	0.07	1.00E+00	1.00E+00	1.00E+00
Cyclohexane	110-82-7	3.44	1.00E+00	1.10E+00	1.00E+00
Cyclohexanone	108-94-1	0.81	1.00E+00	1.00E+00	1.00E+00
Cyclohexene	110-83-8	2.86	1.00E+00	1.00E+00	1.00E+00
Cyclopentane	287-92-3	3.00	1.00E+00	1.00E+00	1.00E+00
Ethyl alcohol	64-17-5	-0.31	1.00E+00	1.00E+00	1.00E+00
Ethyl ether	60-29-7	0.89	1.00E+00	1.00E+00	1.00E+00
Ethyl methacrylate	97-63-2	1.59	1.00E+00	1.00E+00	1.00E+00
Formaldehyde	50-00-0	0.34	1.00E+00	1.00E+00	1.00E+00
Formamide	75-12-7	-1.51	1.00E+00	1.00E+00	1.00E+00
Formic acid	64-18-6	-0.54	1.00E+00	1.00E+00	1.00E+00
Formic acid, methyl ester	107-31-3	-0.26	1.00E+00	1.00E+00	1.00E+00
Glycidylaldehyde	765-34-4	-0.12	1.00E+00	1.00E+00	1.00E+00
Methyl acetate	79-20-9	0.46	1.00E+00	1.00E+00	1.00E+00
Methyl alcohol	67-56-1	-0.71	1.00E+00	1.00E+00	1.00E+00
Methyl isocyanate	624-83-9	No data	1.00E+00	No data	No data
Methyl methacrylate	80-62-6	0.79	1.00E+00	1.00E+00	1.00E+00
Methyl tert-butyl ether	1634-04-4	0.94	1.00E+00	1.00E+00	1.00E+00
Methylacetylene	74-99-7	0.94	1.00E+00	1.00E+00	1.00E+00
Methylcyclohexane	108-87-2	4.10	1.00E+00	1.30E+00	1.10E+00
N,N-Dimethylacetamide	127-19-5	No data	1.00E+00	No data	No data
n-Butyl alcohol	71-36-3	0.88	1.00E+00	1.00E+00	1.00E+00
n-Heptane	142-82-5	4.66	1.00E+00	2.20E+00	1.60E+00
n-Hexane	110-54-3	4.11	1.00E+00	1.30E+00	1.10E+00
Nitromethane	75-52-5	-0.35	1.00E+00	1.00E+00	1.00E+00
n-Nonane	111-84-2	5.65	1.00E+00	8.00E+00	1.00E+01
n-Octane	111-65-9	4.00	1.00E+00	1.30E+00	1.10E+00
n-Pentane	109-66-0	3.21	1.00E+00	1.00E+00	1.00E+00

Table C2-5 Food Chain Multipliers for Bioaccumulation of COPCs and ROPCs by Mammals and Birds

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	FCM, Level 2[b]	FCM, Level 3[c]	FCM, Level 4[d]
n-Propionaldehyde	123-38-6	0.59	1.00E+00	1.00E+00	1.00E+00
n-Propyl alcohol	71-23-8	0.25	1.00E+00	1.00E+00	1.00E+00
n-Valeraldehyde	110-62-3	No data	1.00E+00	No data	No data
Oxirane	75-21-8	-0.30	1.00E+00	1.00E+00	1.00E+00
p-Cymene	99-87-6	4.10	1.00E+00	1.30E+00	1.10E+00
Phosgene	75-44-5	No data	1.00E+00	No data	No data
Propargyl alcohol	107-19-7	-0.38	1.00E+00	1.00E+00	1.00E+00
Propionic acid	79-09-4	0.33	1.00E+00	1.00E+00	1.00E+00
Propionitrile	107-12-0	0.16	1.00E+00	1.00E+00	1.00E+00
Propylene glycol monomethyl ether	107-98-2	-0.49	1.00E+00	1.00E+00	1.00E+00
p-tert-Butyltoluene	98-51-1	No data	1.00E+00	No data	No data
Triethylamine	121-44-8	1.45	1.00E+00	1.00E+00	1.00E+00
Trimethylamine	75-50-3	0.16	1.00E+00	1.00E+00	1.00E+00
Vinyl acetate	108-05-4	0.70	1.00E+00	1.00E+00	1.00E+00
Non-aromatic Halogenated Hydrocarbons					
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	3.41	1.00E+00	1.10E+00	1.00E+00
1,1,1,2-Tetrachloroethane	630-20-6	2.63	1.00E+00	1.00E+00	1.00E+00
1,1,1-Trichloroethane	71-55-6	2.42	1.00E+00	1.00E+00	1.00E+00
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	3.73	1.00E+00	1.10E+00	1.00E+00
1,1,2,2-Tetrachloroethane	79-34-5	4.64	1.00E+00	2.00E+00	1.50E+00
1,1,2,2-Tetrachloroethene	127-18-4	2.55	1.00E+00	1.00E+00	1.00E+00
1,1,2-Trichloroethane	79-00-5	2.10	1.00E+00	1.00E+00	1.00E+00
1,1,2-Trichloroethylene	79-01-6	2.43	1.00E+00	1.00E+00	1.00E+00
1,1-Dichloroethane	75-34-3	1.79	1.00E+00	1.00E+00	1.00E+00
1,1-Dichloroethene	75-35-4	2.12	1.00E+00	1.00E+00	1.00E+00
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	3.16	1.00E+00	1.00E+00	1.00E+00
1,2,3-Trichloropropane	96-18-4	2.25	1.00E+00	1.00E+00	1.00E+00
1,2-Dibromo-3-chloropropane	96-12-8	2.34	1.00E+00	1.00E+00	1.00E+00
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	2.82	1.00E+00	1.00E+00	1.00E+00
1,2-Dichloroethane	107-06-2	1.46	1.00E+00	1.00E+00	1.00E+00
1,2-Dichloroethylene	540-59-0	2.09	1.00E+00	1.00E+00	1.00E+00
1,2-Dichloropropane	78-87-5	2.25	1.00E+00	1.00E+00	1.00E+00
1,3-Dichloropropene	542-75-6	1.75	1.00E+00	1.00E+00	1.00E+00
1,4-Dichloro-2-butene	764-41-0	0.87	1.00E+00	1.00E+00	1.00E+00
1-Chloroethene	75-01-4	1.15	1.00E+00	1.00E+00	1.00E+00
2,2-Dichloropropionic acid	75-99-0	1.68	1.00E+00	1.00E+00	1.00E+00
2-Chloropropane	75-29-6	1.90	1.00E+00	1.00E+00	1.00E+00
3-Chloropropene (Allyl chloride)	107-05-1	1.93	1.00E+00	1.00E+00	1.00E+00
Bromochloromethane	74-97-5	1.41	1.00E+00	1.00E+00	1.00E+00
Bromodichloromethane	75-27-4	2.03	1.00E+00	1.00E+00	1.00E+00
Bromoethene	593-60-2	1.07	1.00E+00	1.00E+00	1.00E+00
Bromoform	75-25-2	2.35	1.00E+00	1.00E+00	1.00E+00

Table C2-5 Food Chain Multipliers for Bioaccumulation of COPCs and ROPCs by Mammals and Birds

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	FCM, Level 2[b]	FCM, Level 3[c]	FCM, Level 4[d]
Bromomethane	74-83-9	1.11	1.00E+00	1.00E+00	1.00E+00
Carbon tetrachloride	56-23-5	2.72	1.00E+00	1.00E+00	1.00E+00
Chlorodibromomethane	124-48-1	2.18	1.00E+00	1.00E+00	1.00E+00
Chlorodifluoromethane	75-45-6	1.08	1.00E+00	1.00E+00	1.00E+00
Chloroethane	75-00-3	3.10	1.00E+00	1.00E+00	1.00E+00
Chloroform	67-66-3	1.95	1.00E+00	1.00E+00	1.00E+00
Chloromethane	74-87-3	0.90	1.00E+00	1.00E+00	1.00E+00
Chloropentafluoroethane	76-15-3	2.10	1.00E+00	1.00E+00	1.00E+00
cis-1,2-Dichloroethene	156-59-2	1.98	1.00E+00	1.00E+00	1.00E+00
cis-1,3-Dichloropropene	10061-01-5	No data	1.00E+00	No data	No data
Cyanogen bromide	506-68-3	-0.29	1.00E+00	1.00E+00	1.00E+00
Cyanogen chloride	506-77-4	-0.38	1.00E+00	1.00E+00	1.00E+00
Dichlorodifluoromethane	75-71-8	2.16	1.00E+00	1.00E+00	1.00E+00
Dichlorofluoromethane	75-43-4	1.55	1.00E+00	1.00E+00	1.00E+00
Dichloromethane	75-09-2	1.26	1.00E+00	1.00E+00	1.00E+00
Difluorodibromomethane	75-61-6	No data	1.00E+00	No data	No data
Hexafluoroacetone	684-16-2	No data	1.00E+00	No data	No data
Iodomethane	74-88-4	1.69	1.00E+00	1.00E+00	1.00E+00
Methylene bromide	74-95-3	1.62	1.00E+00	1.00E+00	1.00E+00
Pentachloroethane	76-01-7	3.05	1.00E+00	1.00E+00	1.00E+00
trans-1,2-Dichloroethylene	156-60-5	1.98	1.00E+00	1.00E+00	1.00E+00
trans-1,3-Dichloropropene	10061-02-6	2.06	1.00E+00	1.00E+00	1.00E+00
Trichloroacetic acid	76-03-9	1.33	1.00E+00	1.00E+00	1.00E+00
Trichlorofluoroethane	27154-33-2	No data	1.00E+00	No data	No data
Trichlorofluoromethane	75-69-4	2.53	1.00E+00	1.00E+00	1.00E+00
Trifluorobromomethane	75-63-8	1.86	1.00E+00	1.00E+00	1.00E+00
Dioxin and Furan Compounds (PCDDs/PCDFs)					
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	8.20	1.00E+00	6.40E+00	4.50E+00
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	7.92	1.00E+00	9.20E+00	9.80E+00
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	7.92	1.00E+00	9.20E+00	9.80E+00
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	7.79	1.00E+00	1.00E+01	1.20E+01
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	7.25	1.00E+00	1.30E+01	2.30E+01
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	7.25	1.00E+00	1.30E+01	2.30E+01
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	7.25	1.00E+00	1.30E+01	2.30E+01
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	7.25	1.00E+00	1.30E+01	2.30E+01
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	7.25	1.00E+00	1.30E+01	2.30E+01
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	6.64	1.00E+00	1.40E+01	2.60E+01
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	6.79	1.00E+00	1.40E+01	2.70E+01
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	7.25	1.00E+00	1.30E+01	2.30E+01
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	6.92	1.00E+00	1.40E+01	2.70E+01
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	6.64	1.00E+00	1.40E+01	2.60E+01
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	6.53	1.00E+00	1.40E+01	2.50E+01

Table C2-5 Food Chain Multipliers for Bioaccumulation of COPCs and ROPCs by Mammals and Birds

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	FCM, Level 2[b]	FCM, Level 3[c]	FCM, Level 4[d]
Dibenzofuran	132-64-9	4.33	1.00E+00	1.50E+00	1.20E+00
Octachlorodibenzo(p)dioxin	3268-87-9	7.59	1.00E+00	1.20E+01	1.70E+01
Octachlorodibenzofuran	39001-02-0	8.78	1.00E+00	2.20E+00	5.20E-01
Total dioxins and dibenzofurans	No CAS #	No data	1.00E+00	No data	No data
	Polychlorinated Biphenyls (PCBs)				
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	7.08	1.00E+00	1.40E+01	2.50E+01
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	7.12	1.00E+00	1.40E+01	2.50E+01
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No data	1.00E+00	No data	No data
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No data	1.00E+00	No data	No data
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No data	1.00E+00	No data	No data
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No data	1.00E+00	No data	No data
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No data	1.00E+00	No data	No data
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No data	1.00E+00	No data	No data
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No data	1.00E+00	No data	No data
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	7.12	1.00E+00	1.40E+01	2.50E+01
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	7.41	1.00E+00	1.30E+01	2.10E+01
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No data	1.00E+00	No data	No data
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No data	1.00E+00	No data	No data
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No data	1.00E+00	No data	No data
Polychlorinated biphenyls (PCBs)[e]	1336-36-3	6.29	1.00E+00	1.30E+01	2.20E+01
	Phthalates				
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	5.20	1.00E+00	4.20E+00	3.90E+00
Butylbenzyl phthalate	85-68-7	4.41	1.00E+00	1.60E+00	1.20E+00
Dibutyl phthalate	84-74-2	4.72	1.00E+00	2.20E+00	1.60E+00
Diethyl phthalate	84-66-2	4.44	1.00E+00	1.60E+00	1.20E+00
Dimethyl phthalate	131-11-3	1.63	1.00E+00	1.00E+00	1.00E+00
n-Dioctyl phthalate	117-84-0	9.33	1.00E+00	1.50E+00	2.30E-01
	Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)				
2-Chloronaphthalene	91-58-7	4.07	1.00E+00	1.30E+00	1.10E+00
2-Methyl naphthalene	91-57-6	3.86	1.00E+00	1.20E+00	1.10E+00
5-Nitroacenaphthene	602-87-9	No data	1.00E+00	No data	No data
Acenaphthene	83-32-9	3.96	1.00E+00	1.30E+00	1.10E+00
Acenaphthylene	208-96-8	4.07	1.00E+00	1.30E+00	1.10E+00
Anthracene	120-12-7	4.47	1.00E+00	1.80E+00	1.30E+00
Fluorene	86-73-7	4.17	1.00E+00	1.40E+00	1.10E+00
Indene	95-13-6	No data	1.00E+00	No data	No data
Naphthalene	91-20-3	3.37	1.00E+00	1.10E+00	1.00E+00
Phenanthrene	85-01-8	4.55	1.00E+00	2.00E+00	1.50E+00
Pyrene	129-00-0	5.00	1.00E+00	3.20E+00	2.60E+00

Table C2-5 Food Chain Multipliers for Bioaccumulation of COPCs and ROPCs by Mammals and Birds

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	FCM, Level 2[b]	FCM, Level 3[c]	FCM, Level 4[d]
	Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)				
3-Methylcholanthrene	56-49-5	7.11	1.00E+00	1.40E+01	2.50E+01
5-Methylchrysene	3697-24-3	No data	1.00E+00	No data	No data
Benzo[a]anthracene	56-55-3	5.68	1.00E+00	8.00E+00	1.00E+01
Benzo[a]pyrene	50-32-8	6.13	1.00E+00	1.10E+01	1.80E+01
Benzo[a,i]pyrene	191-30-0	No data	1.00E+00	No data	No data
Benzo[b]fluoranthene	205-99-2	6.20	1.00E+00	1.20E+01	2.00E+01
Benzo[e]pyrene	192-97-2	7.40	1.00E+00	1.30E+01	2.10E+01
Benzo[g,h,i]perylene	191-24-2	7.10	1.00E+00	1.40E+01	2.50E+01
Benzo[j]fluoranthene	205-82-3	6.44	1.00E+00	1.30E+01	2.30E+01
Benzo[k]fluoranthene	207-08-9	6.19	1.00E+00	1.20E+01	2.00E+01
Chrysene	218-01-9	5.74	1.00E+00	8.00E+00	1.00E+01
Dibenz[a,h]acridine	226-36-8	No data	1.00E+00	No data	No data
Dibenz[a,h]anthracene	53-70-3	6.55	1.00E+00	1.40E+01	2.50E+01
Dibenz[a,j]acridine	224-42-0	No data	1.00E+00	No data	No data
Dibenzo[a,e]fluoranthene	5385-75-1	No data	1.00E+00	No data	No data
Dibenzo[a,e]pyrene	192-65-4	No data	1.00E+00	No data	No data
Dibenzo[a,h]fluoranthene	No CAS #	No data	1.00E+00	No data	No data
Dibenzo[a,h]pyrene	189-64-0	No data	1.00E+00	No data	No data
Dibenzo[a,i]pyrene	189-55-9	7.29	1.00E+00	1.30E+01	2.30E+01
Fluoranthene	206-44-0	5.08	1.00E+00	3.60E+00	3.20E+00
Hexachloronaphthalene	1335-87-1	7.59	1.00E+00	1.20E+01	1.70E+01
Indeno[1,2,3-cd]pyrene	193-39-5	6.91	1.00E+00	1.40E+01	2.70E+01
Octachloronaphthalene	2234-13-1	6.42	1.00E+00	1.30E+01	2.30E+01
Pentachloronaphthalene	1321-64-8	No data	1.00E+00	No data	No data
Tetrachloronaphthalene	1335-88-2	No data	1.00E+00	No data	No data
Trichloronaphthalene	1321-65-9	No data	1.00E+00	No data	No data
	Light Substituted Benzene Compounds (molecular weight <200 g/mole)				
1,2,3-Trichlorobenzene	87-61-6	4.05	1.00E+00	1.30E+00	1.10E+00
1,2,4-Trichlorobenzene	120-82-1	3.99	1.00E+00	1.30E+00	1.10E+00
1,2,4-Trimethyl benzene	95-63-6	3.65	1.00E+00	1.10E+00	1.00E+00
1,2-Dichlorobenzene	95-50-1	3.45	1.00E+00	1.10E+00	1.00E+00
1,3,5-Trimethyl benzene	108-67-8	3.42	1.00E+00	1.10E+00	1.00E+00
1,3-Dichlorobenzene	541-73-1	3.53	1.00E+00	1.10E+00	1.00E+00
1,3-Dinitrobenzene	99-65-0	1.49	1.00E+00	1.00E+00	1.00E+00
1,4-Dichlorobenzene	106-46-7	3.41	1.00E+00	1.10E+00	1.00E+00
1,4-Dinitrobenzene	100-25-4	1.50	1.00E+00	1.00E+00	1.00E+00
2,4,5-Trichlorophenol	95-95-4	3.87	1.00E+00	1.20E+00	1.10E+00
2,4,6-Trichlorophenol	88-06-2	3.71	1.00E+00	1.10E+00	1.00E+00
2,4-Dichlorophenol	120-83-2	3.04	1.00E+00	1.00E+00	1.00E+00

Table C2-5 Food Chain Multipliers for Bioaccumulation of COPCs and ROPCs by Mammals and Birds

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	FCM, Level 2[b]	FCM, Level 3[c]	FCM, Level 4[d]
2,4-Dimethylphenol	105-67-9	2.36	1.00E+00	1.00E+00	1.00E+00
2,4-Dinitrophenol	51-28-5	1.52	1.00E+00	1.00E+00	1.00E+00
2,4-Dinitrotoluene	121-14-2	2.00	1.00E+00	1.00E+00	1.00E+00
2,6-Dinitrotoluene	606-20-2	1.89	1.00E+00	1.00E+00	1.00E+00
2-Chlorophenol	95-57-8	2.16	1.00E+00	1.00E+00	1.00E+00
2-Chlorotoluene	95-49-8	3.54	1.00E+00	1.10E+00	1.00E+00
2-Nitrophenol	88-75-5	1.79	1.00E+00	1.00E+00	1.00E+00
4,6-Dinitro-o-cresol	534-52-1	2.12	1.00E+00	1.00E+00	1.00E+00
4-Chlorotoluene	106-43-4	3.33	1.00E+00	1.10E+00	1.00E+00
4-Nitrophenol	100-02-7	1.91	1.00E+00	1.00E+00	1.00E+00
alpha-Methylstyrene	98-83-9	3.46	1.00E+00	1.10E+00	1.00E+00
Aniline	62-53-3	0.98	1.00E+00	1.00E+00	1.00E+00
Benzotrichloride	98-07-7	2.92	1.00E+00	1.00E+00	1.00E+00
Benzyl chloride	100-44-7	2.30	1.00E+00	1.00E+00	1.00E+00
Bromobenzene	108-86-1	2.99	1.00E+00	1.00E+00	1.00E+00
Chlorobenzene	108-90-7	2.79	1.00E+00	1.00E+00	1.00E+00
Cumene	98-82-8	3.61	1.00E+00	1.10E+00	1.00E+00
m-Cresol	108-39-4	1.96	1.00E+00	1.00E+00	1.00E+00
n-Butyl benzene	104-51-8	4.28	1.00E+00	1.50E+00	1.20E+00
Nitrobenzene	98-95-3	1.83	1.00E+00	1.00E+00	1.00E+00
n-Propyl benzene	103-65-1	3.69	1.00E+00	1.10E+00	1.00E+00
o-Cresol	95-48-7	2.02	1.00E+00	1.00E+00	1.00E+00
o-Dinitrobenzene	528-29-0	1.69	1.00E+00	1.00E+00	1.00E+00
o-Nitroaniline	88-74-4	1.85	1.00E+00	1.00E+00	1.00E+00
o-Toluidine	95-53-4	1.34	1.00E+00	1.00E+00	1.00E+00
p-Chloroaniline	106-47-8	1.87	1.00E+00	1.00E+00	1.00E+00
p-Cresol	106-44-5	1.94	1.00E+00	1.00E+00	1.00E+00
Phenol	108-95-2	1.48	1.00E+00	1.00E+00	1.00E+00
p-Nitrochlorobenzene	100-00-5	2.39	1.00E+00	1.00E+00	1.00E+00
p-Toluidine	106-49-0	1.40	1.00E+00	1.00E+00	1.00E+00
sec-Butyl benzene	135-98-8	No data	1.00E+00	1.00E+00	1.00E+00
tert-Butyl benzene	98-06-6	4.11	1.00E+00	1.30E+00	1.10E+00
Toluene-2,6-diamine	823-40-5	0.16	1.00E+00	1.00E+00	1.00E+00
Trimethyl benzene	25551-13-7	3.42	1.00E+00	1.10E+00	1.00E+00
Other Light Semivolatile Compounds (molecular weight <200 g/mole)					
1,1'-Biphenyl	92-52-4	3.90	1.00E+00	1.20E+00	1.10E+00
1,1-Dimethylhydrazine	57-14-7	-1.19	1.00E+00	1.00E+00	1.00E+00
1,2-Dimethylhydrazine	540-73-8	-1.37	1.00E+00	1.00E+00	1.00E+00
1,2-Diphenylhydrazine	122-66-7	2.94	1.00E+00	1.00E+00	1.00E+00
1,3-Propane sultone	1120-71-4	-0.52	1.00E+00	1.00E+00	1.00E+00
2,4-Toluene diisocyanate	584-84-9	No data	1.00E+00	No data	No data

Table C2-5 Food Chain Multipliers for Bioaccumulation of COPCs and ROPCs by Mammals and Birds

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	FCM, Level 2[b]	FCM, Level 3[c]	FCM, Level 4[d]
2-Chloroacetophenone	532-27-4	1.93	1.00E+00	1.00E+00	1.00E+00
2-Propenoic acid	79-10-7	0.43	1.00E+00	1.00E+00	1.00E+00
4,4'-Methylenedianiline	101-77-9	1.59	1.00E+00	1.10E+00	1.00E+00
Acetophenone	98-86-2	1.64	1.00E+00	1.00E+00	1.00E+00
Benzoic acid	65-85-0	1.87	1.00E+00	1.00E+00	1.00E+00
bis(2-Chloroethoxy)methane	111-91-1	1.30	1.00E+00	1.00E+00	1.00E+00
bis(2-Chloroethyl) ether	111-44-4	1.30	1.00E+00	1.00E+00	1.00E+00
Chlorocyclopentadiene	41851-50-7	2.43	1.00E+00	1.00E+00	1.00E+00
Cyclohexanol	108-93-0	1.23	1.00E+00	1.00E+00	1.00E+00
Dichloroisopropyl ether	108-60-1	2.58	1.00E+00	1.00E+00	1.00E+00
Dichloromethyl ether	542-88-1	0.58	1.00E+00	1.00E+00	1.00E+00
Dichloropentadiene	61626-71-9	No data	1.00E+00	No data	No data
Dimethyl sulfate	77-78-1	0.16	1.00E+00	1.00E+00	1.00E+00
Dimethylaniline	121-69-7	2.31	1.00E+00	1.00E+00	1.00E+00
Di-n-propylnitrosamine	621-64-7	1.38	1.00E+00	1.00E+00	1.00E+00
Diphenyl ether	101-84-8	4.21	1.00E+00	1.40E+00	1.10E+00
Epichlorohydrin	106-89-8	0.25	1.00E+00	1.00E+00	1.00E+00
Ethyl carbamate (Urethane)	51-79-6	-0.15	1.00E+00	1.00E+00	1.00E+00
Ethyl methanesulfonate	62-50-0	0.05	1.00E+00	1.00E+00	1.00E+00
Ethylene dibromide	106-93-4	1.75	1.00E+00	1.00E+00	1.00E+00
Ethylene glycol	107-21-1	-1.36	1.00E+00	1.00E+00	1.00E+00
Ethylene glycol monobutyl ether	111-76-2	0.83	1.00E+00	1.00E+00	1.00E+00
Ethylene glycol monoethyl ether acetate	111-15-9	0.59	1.00E+00	1.00E+00	1.00E+00
Ethylene thiourea	96-45-7	-0.66	1.00E+00	1.00E+00	1.00E+00
Furfural	98-01-1	0.96	1.00E+00	1.00E+00	1.00E+00
Maleic hydrazide	123-33-1	-0.84	1.00E+00	1.00E+00	1.00E+00
Malononitrile	109-77-3	-0.60	1.00E+00	1.00E+00	1.00E+00
Methyl styrene (mixed isomers)	25013-15-4	3.48	1.00E+00	1.10E+00	1.00E+00
Methylhydrazine	60-34-4	-1.05	1.00E+00	1.00E+00	1.00E+00
N,N-Diphenylamine	122-39-4	3.50	1.00E+00	1.10E+00	1.00E+00
Nitric acid, propyl ester	627-13-4	No data	1.00E+00	No data	No data
N-Nitrosodi-n-butylamine	924-16-3	2.41	1.00E+00	1.00E+00	1.00E+00
N-Nitrosomorpholine	59-89-2	0.98	1.00E+00	1.00E+00	1.00E+00
N-Nitroso-N,N-dimethylamine	62-75-9	-0.57	1.00E+00	1.00E+00	1.00E+00
o-Anisidine	90-04-0	1.18	1.00E+00	1.00E+00	1.00E+00
Oxalic acid	144-62-7	No data	1.00E+00	No data	No data
Phthalic anhydride	85-44-9	-0.60	1.00E+00	1.00E+00	1.00E+00
p-Phthalic acid	100-21-0	2.00	1.00E+00	1.00E+00	1.00E+00
Pyridine	110-86-1	0.67	1.00E+00	1.00E+00	1.00E+00
Quinoline	91-22-5	2.03	1.00E+00	1.00E+00	1.00E+00
Quinone	106-51-4	0.20	1.00E+00	1.00E+00	1.00E+00
Safrole	94-59-7	2.66	1.00E+00	1.00E+00	1.00E+00

Table C2-5 Food Chain Multipliers for Bioaccumulation of COPCs and ROPCs by Mammals and Birds

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	FCM, Level 2[b]	FCM, Level 3[c]	FCM, Level 4[d]
Tetrahydrofuran	109-99-9	0.45	1.00E+00	1.00E+00	1.00E+00
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)					
1,2,4,5-Tetrachlorobenzene	95-94-3	4.64	1.00E+00	2.00E+00	1.50E+00
1,3,5-Trinitrobenzene	99-35-4	1.18	1.00E+00	1.00E+00	1.00E+00
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	4.17	1.00E+00	1.40E+00	1.10E+00
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	4.5	1.00E+00	1.80E+00	1.30E+00
2-sec-Butyl-4,6-dinitrophenol	88-85-7	3.56	1.00E+00	1.10E+00	1.00E+00
3,3'-Dichlorobenzidine	91-94-1	3.58	1.00E+00	1.10E+00	1.00E+00
3,3'-Dimethoxybenzidine	119-90-4	1.81	1.00E+00	1.00E+00	1.00E+00
4-Bromophenylphenyl ether	101-55-3	5.04	1.00E+00	3.20E+00	2.60E+00
Ammonium perfluorooctanoate	3825-26-1	No data	1.00E+00	No data	No data
Azobenzene	103-33-3	3.82	1.00E+00	1.20E+00	1.00E+00
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	96-69-5	NA	1.00E+00	No data	No data
Captan	133-06-2	2.35	1.00E+00	1.00E+00	1.00E+00
Chlorobenzilate	510-15-6	4.38	1.00E+00	1.60E+00	1.20E+00
Dibutylphosphate	107-66-4	No data	1.00E+00	No data	No data
Dimethyl aminoazobenzene	60-11-7	4.58	1.00E+00	2.00E+00	1.50E+00
Hexachlorobenzene	118-74-1	5.50	1.00E+00	6.30E+00	7.10E+00
Hexachlorobutadiene	87-68-3	4.73	1.00E+00	2.20E+00	1.60E+00
Hexachlorocyclopentadiene	77-47-4	4.91	1.00E+00	2.80E+00	2.20E+00
Hexachloroethane	67-72-1	3.98	1.00E+00	1.30E+00	1.10E+00
Hexachlorophene	70-30-4	7.54	1.00E+00	1.30E+01	1.90E+01
Hexamethylene-1,5-diisocyanate	822-06-0	3.20	1.00E+00	1.00E+00	1.00E+00
Mirex	2385-85-5	6.89	1.00E+00	1.40E+01	2.70E+01
Nitrofen	1836-75-5	5.53	1.00E+00	6.30E+00	7.10E+00
Pentachlorobenzene	608-93-5	5.09	1.00E+00	3.60E+00	3.20E+00
Pentachloronitrobenzene	82-68-8	4.64	1.00E+00	2.00E+00	1.50E+00
Pentachlorophenol	87-86-5	5.08	1.00E+00	3.60E+00	3.20E+00
Picric acid	88-89-1	2.03	1.00E+00	1.00E+00	1.00E+00
Pronamide	23950-58-5	3.51	1.00E+00	1.10E+00	1.00E+00
Strychnine	57-24-9	1.93	1.00E+00	1.00E+00	1.00E+00
Terphenyls	26140-60-3	No data	1.00E+00	No data	No data
Tributyl phosphate	126-73-8	4.00	1.00E+00	1.30E+00	1.10E+00
Trifluralin	1582-09-8	5.34	1.00E+00	4.80E+00	4.70E+00
Triphenylamine	603-34-9	No data	1.00E+00	No data	No data
Herbicides and Organochlorinated Pesticides					
2,4,5-T	93-76-5	3.36	1.00E+00	1.10E+00	1.00E+00
2,4-D and esters	94-75-7	2.81	1.00E+00	1.00E+00	1.00E+00
4,4'-DDD	72-54-8	6.12	1.00E+00	1.10E+01	1.80E+01
4,4'-DDE	72-55-9	6.26	1.00E+00	1.30E+01	2.20E+01
4,4'-DDT	50-29-3	6.07	1.00E+00	1.10E+01	1.80E+01

Table C2-5 Food Chain Multipliers for Bioaccumulation of COPCs and ROPCs by Mammals and Birds

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	FCM, Level 2[b]	FCM, Level 3[c]	FCM, Level 4[d]
Aldrin	309-00-2	6.18	1.00E+00	1.20E+01	2.00E+01
alpha-BHC	319-84-6	3.80	1.00E+00	1.20E+00	1.00E+00
beta-BHC	319-85-7	3.83	1.00E+00	1.20E+00	1.00E+00
Chlordane	57-74-9	5.94	1.00E+00	9.70E+00	1.40E+01
Delta-BHC	319-86-8	4.14	1.00E+00	1.30E+00	1.10E+00
Dieldrin	60-57-1	5.27	1.00E+00	4.80E+00	4.70E+00
Endothall	145-73-3	-0.87	1.00E+00	1.00E+00	1.00E+00
Endrin	72-20-8	4.89	1.00E+00	2.80E+00	2.20E+00
gamma-BHC (Lindane)	58-89-9	3.72	1.00E+00	1.10E+00	1.00E+00
Heptachlor	76-44-8	5.02	1.00E+00	3.20E+00	2.60E+00
Isodrin	465-73-6	No data	1.00E+00	1.00E+00	1.00E+00
Methoxychlor	72-43-5	4.53	1.00E+00	1.80E+00	1.30E+00
Silvex (2,4,5-TP)	93-72-1	3.80	1.00E+00	1.20E+00	1.00E+00
Toxaphene	8001-35-2	5.50	1.00E+00	6.30E+00	7.10E+00
Inorganic Chemicals and Compounds [f]					
	Metals				
Aluminum	7429-90-5	NA	1.00E+00	1.00E+00	1.00E+00
Antimony	7440-36-0	NA	1.00E+00	1.00E+00	1.00E+00
Arsenic	7440-38-2	NA	1.00E+00	1.00E+00	1.00E+00
Barium	7440-39-3	NA	1.00E+00	1.00E+00	1.00E+00
Beryllium	7440-41-7	NA	1.00E+00	1.00E+00	1.00E+00
Bismuth	7440-69-9	NA	1.00E+00	1.00E+00	1.00E+00
Boron	7440-42-8	NA	1.00E+00	1.00E+00	1.00E+00
Cadmium	7440-43-9	NA	1.00E+00	1.00E+00	1.00E+00
Calcium	7440-70-2	NA	1.00E+00	1.00E+00	1.00E+00
Chromium[g]	18540-29-9	NA	1.00E+00	1.00E+00	1.00E+00
Cobalt	7440-48-4	NA	1.00E+00	1.00E+00	1.00E+00
Copper	7440-50-8	NA	1.00E+00	1.00E+00	1.00E+00
Iron	7439-89-6	NA	1.00E+00	1.00E+00	1.00E+00
Lead	7439-92-1	NA	1.00E+00	1.00E+00	1.00E+00
Lithium	7439-93-2	NA	1.00E+00	1.00E+00	1.00E+00
Magnesium	7439-95-4	NA	1.00E+00	1.00E+00	1.00E+00
Manganese	7439-96-5	NA	1.00E+00	1.00E+00	1.00E+00
Mercury	7439-97-6	NA	NA	NA	NA
Mercury - Hg+2	7487-94-7	NA	1.00E+00	1.00E+00	1.00E+00
Methylmercury	22967-92-6	NA	1.00E+00	1.00E+00	1.00E+00
Molybdenum	7439-98-7	NA	1.00E+00	1.00E+00	1.00E+00
Nickel	7440-02-0	NA	1.00E+00	1.00E+00	1.00E+00
Potassium	7440-09-7	NA	1.00E+00	1.00E+00	1.00E+00
Rhodium	7440-16-6	NA	1.00E+00	1.00E+00	1.00E+00
Selenium	7782-49-2	NA	1.00E+00	1.00E+00	1.00E+00

Table C2-5 Food Chain Multipliers for Bioaccumulation of COPCs and ROPCs by Mammals and Birds

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	FCM, Level 2[b]	FCM, Level 3[c]	FCM, Level 4[d]
Silicon	7440-21-3	NA	1.00E+00	1.00E+00	1.00E+00
Silver	7440-22-4	NA	1.00E+00	1.00E+00	1.00E+00
Sodium	7440-23-5	NA	1.00E+00	1.00E+00	1.00E+00
Strontium	7440-24-6	NA	1.00E+00	1.00E+00	1.00E+00
Tantalum	7440-25-7	NA	1.00E+00	1.00E+00	1.00E+00
Thallium	7440-28-0	NA	1.00E+00	1.00E+00	1.00E+00
Tin	7440-31-5	NA	1.00E+00	1.00E+00	1.00E+00
Tungsten	7440-33-7	NA	1.00E+00	1.00E+00	1.00E+00
Uranium	7440-61-1	NA	1.00E+00	1.00E+00	1.00E+00
Vanadium	7440-62-2	NA	1.00E+00	1.00E+00	1.00E+00
Yttrium	7440-65-5	NA	1.00E+00	1.00E+00	1.00E+00
Zinc	7440-66-6	NA	1.00E+00	1.00E+00	1.00E+00
Zirconium	7440-67-7	NA	1.00E+00	1.00E+00	1.00E+00
Non-metals and Anions					
Ammonia/Ammonium	7664-41-7	NA	1.00E+00	1.00E+00	1.00E+00
Bromide	24959-67-9	NA	1.00E+00	1.00E+00	1.00E+00
Chloride	16887-00-6	NA	1.00E+00	1.00E+00	1.00E+00
Cyanide	57-12-5	NA	1.00E+00	1.00E+00	1.00E+00
Fluoride	16984-48-8	NA	1.00E+00	1.00E+00	1.00E+00
Hydroxide	14280-30-9	NA	1.00E+00	1.00E+00	1.00E+00
Iodine	7553-56-2	NA	1.00E+00	1.00E+00	1.00E+00
Nitrate	14797-55-8	NA	1.00E+00	1.00E+00	1.00E+00
Nitrite	14797-65-0	NA	1.00E+00	1.00E+00	1.00E+00
Phosphate	14265-44-2	NA	1.00E+00	1.00E+00	1.00E+00
Phosphorus	7723-14-0	NA	1.00E+00	1.00E+00	1.00E+00
Sulfate	14808-79-8	NA	1.00E+00	1.00E+00	1.00E+00
Total Sulfur	63705-05-5	NA	1.00E+00	1.00E+00	1.00E+00
Criteria Pollutants					
Carbon monoxide	630-08-0	NA	1.00E+00	1.00E+00	1.00E+00
Nitrogen dioxide	10102-44-0	NA	1.00E+00	1.00E+00	1.00E+00
Ozone	10028-15-6	NA	1.00E+00	1.00E+00	1.00E+00
Particulate matter	No CAS #	NA	1.00E+00	1.00E+00	1.00E+00
Sulfur dioxide	7446-09-5	NA	1.00E+00	1.00E+00	1.00E+00
Radionuclides					
All radionuclides combined (rad/d)	No CAS #	NA	1.00E+00	1.00E+00	1.00E+00
Actinium-227	14952-40-0	NA	1.00E+00	1.00E+00	1.00E+00
Americium-241	14596-10-2	NA	1.00E+00	1.00E+00	1.00E+00
Americium-243	14993-75-0	NA	1.00E+00	1.00E+00	1.00E+00
Antimony-125	14234-35-6	NA	1.00E+00	1.00E+00	1.00E+00
Barium-137m	13981-97-0	NA	1.00E+00	1.00E+00	1.00E+00
Cadmium-113m	14336-66-4	NA	1.00E+00	1.00E+00	1.00E+00
Carbon-14	14762-75-5	NA	1.00E+00	1.00E+00	1.00E+00

Table C2-5 Food Chain Multipliers for Bioaccumulation of COPCs and ROPCs by Mammals and Birds

Constituent of Potential Concern	CAS Registry Number	Log K_{ow} [a]	FCM, Level 2[b]	FCM, Level 3[c]	FCM, Level 4[d]
Cesium-134	13967-70-9	NA	1.00E+00	1.00E+00	1.00E+00
Cesium-137	10045-97-3	NA	1.00E+00	1.00E+00	1.00E+00
Cobalt-60	10198-40-0	NA	1.00E+00	1.00E+00	1.00E+00
Curium-242	15510-73-3	NA	1.00E+00	1.00E+00	1.00E+00
Curium-243	15757-87-6	NA	1.00E+00	1.00E+00	1.00E+00
Curium-244	13981-15-2	NA	1.00E+00	1.00E+00	1.00E+00
Europium-152	14683-23-9	NA	1.00E+00	1.00E+00	1.00E+00
Europium-154	15585-10-1	NA	1.00E+00	1.00E+00	1.00E+00
Europium-155	14391-16-3	NA	1.00E+00	1.00E+00	1.00E+00
Iodine-129	15046-84-1	NA	1.00E+00	1.00E+00	1.00E+00
Neptunium-237	13994-20-2	NA	1.00E+00	1.00E+00	1.00E+00
Nickel-59	14336-70-0	NA	1.00E+00	1.00E+00	1.00E+00
Nickel-63	13981-37-8	NA	1.00E+00	1.00E+00	1.00E+00
Niobium-93m	7440-03-1[h]	NA	1.00E+00	1.00E+00	1.00E+00
Plutonium-238	13981-16-3	NA	1.00E+00	1.00E+00	1.00E+00
Plutonium-239	15117-48-3	NA	1.00E+00	1.00E+00	1.00E+00
Plutonium-240	14119-33-6	NA	1.00E+00	1.00E+00	1.00E+00
Plutonium-241	14119-32-5	NA	1.00E+00	1.00E+00	1.00E+00
Plutonium-242	13982-10-0	NA	1.00E+00	1.00E+00	1.00E+00
Protactinium-231	14331-85-2	NA	1.00E+00	1.00E+00	1.00E+00
Radium-226	13982-63-3	NA	1.00E+00	1.00E+00	1.00E+00
Radium-228	15262-20-1	NA	1.00E+00	1.00E+00	1.00E+00
Ruthenium-106	13967-48-1	NA	1.00E+00	1.00E+00	1.00E+00
Samarium-151	15715-94-3	NA	1.00E+00	1.00E+00	1.00E+00
Selenium-79	15758-45-9	NA	1.00E+00	1.00E+00	1.00E+00
Strontium-90	10098-97-2	NA	1.00E+00	1.00E+00	1.00E+00
Technetium-99	14133-76-7	NA	1.00E+00	1.00E+00	1.00E+00
Thorium-229	15594-54-4	NA	1.00E+00	1.00E+00	1.00E+00
Thorium-232	7440-29-1	NA	1.00E+00	1.00E+00	1.00E+00
Tin-126	15832-50-5	NA	1.00E+00	1.00E+00	1.00E+00
Tritium	10028-17-8	NA	1.00E+00	1.00E+00	1.00E+00
Uranium-232	14158-29-3	NA	1.00E+00	1.00E+00	1.00E+00
Uranium-233	13968-55-3	NA	1.00E+00	1.00E+00	1.00E+00
Uranium-234	13966-29-5	NA	1.00E+00	1.00E+00	1.00E+00
Uranium-235	15117-96-1	NA	1.00E+00	1.00E+00	1.00E+00
Uranium-236	13982-70-2	NA	1.00E+00	1.00E+00	1.00E+00
Uranium-238	7440-61-1	NA	1.00E+00	1.00E+00	1.00E+00
Yttrium-90	10098-91-6	NA	1.00E+00	1.00E+00	1.00E+00
Zirconium-93	15751-77-6	NA	1.00E+00	1.00E+00	1.00E+00

Table C2-5 Food Chain Multipliers for Bioaccumulation of COPCs and ROPCs by Mammals and Birds

NA = Not applicable.

FCM = Food chain multiplier.

[a] From Appendix B, Table B-1.

[b] Level 2 food chain multiplier from *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (EPA 1999) (SLERAP) Table 5-2, used for bioaccumulation from media to animals by consumption of plants.

[c] Level 3 food chain multiplier from SLERAP Table 5-2, used for omnivores (trophic level 3).

[d] Level 4 food chain multiplier from SLERAP Table 5-2, used for carnivores (trophic level 4).

[e] Values for Aroclor-1254 were used for polychlorinated biphenyl mixtures.

[f] Food chain multipliers for inorganic compounds are assumed to be 1.0, as specified in Final Water Quality Guidance for the Great Lakes System (40 FR 132, Appendix A).

[g] Values for Cr(VI) were used for calculations.

[h] Chemical Abstracts Service Registry number for niobium metal.

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	External DCF[a]		Internal				
				Decay Energies and Absorption Factors				
		Untilled Soil[b]	Air[c]	$E_\alpha n_\alpha$[d]	Φ_α[e]	$E_\beta n_\beta$[f]	Φ_β[g]	$E_\gamma n_\gamma$[h]
Actinium-227	14952-40-0	7.70E-22	5.82E-18	6.80E-02	1.00E+00	1.60E-02	1.00E+00	0.00E+00
Americium-241	14596-10-2	1.15E-19	8.18E-16	5.48E+00	1.00E+00	5.20E-02	1.00E+00	3.30E-02
Americium-243	14993-75-0	2.96E-19	2.18E-15	5.27E+00	1.00E+00	2.20E-02	1.00E+00	5.60E-02
Antimony-125	14234-35-6	2.67E-18	2.02E-14	0.00E+00	1.00E+00	1.00E-01	1.00E+00	4.31E-01
Barium-137m	13981-97-0	3.76E-18	2.88E-14	0.00E+00	1.00E+00	6.50E-02	1.00E+00	5.97E-01
Cadmium-113m	14336-66-4	2.62E-22	1.45E-18	0.00E+00	1.00E+00	9.30E-02	1.00E+00	0.00E+00
Carbon-14	14762-75-5	4.30E-23	2.24E-19	0.00E+00	1.00E+00	4.90E-02	1.00E+00	0.00E+00
Cesium-134	13967-70-9	9.78E-18	7.57E-14	0.00E+00	1.00E+00	1.64E-01	1.00E+00	1.56E+00
Cesium-137	10045-97-3	1.34E-21	7.74E-18	0.00E+00	1.00E+00	1.87E-01	1.00E+00	0.00E+00
Cobalt-60	10198-40-0	1.52E-17	1.26E-13	0.00E+00	1.00E+00	9.70E-02	1.00E+00	2.50E+00
Curium-242	15510-73-3	7.59E-22	5.69E-18	6.10E+00	1.00E+00	1.00E-02	1.00E+00	2.00E-03
Curium-243	15757-87-6	7.79E-19	5.88E-15	5.80E+00	1.00E+00	1.38E-01	1.00E+00	1.34E-01
Curium-244	13981-15-2	6.54E-22	4.91E-18	5.80E+00	1.00E+00	9.00E-03	1.00E+00	2.00E-03
Europium-152	14683-23-9	7.03E-18	5.65E-14	0.00E+00	1.00E+00	1.39E-01	1.00E+00	1.16E+00
Europium-154	15585-10-1	7.62E-18	6.14E-14	0.00E+00	1.00E+00	2.92E-01	1.00E+00	1.24E+00
Europium-155	14391-16-3	3.37E-19	2.49E-15	0.00E+00	1.00E+00	6.30E-02	1.00E+00	6.10E-02
Iodine-129	15046-84-1	5.95E-20	3.80E-16	0.00E+00	1.00E+00	6.40E-02	1.00E+00	2.50E-02
Neptunium-237	13994-20-2	1.38E-19	1.03E-15	4.77E+00	1.00E+00	7.00E-02	1.00E+00	3.50E-02
Nickel-59	14336-70-0	0.00E+00	0.00E+00	0.00E+00	1.00E+00	5.00E-03	1.00E+00	2.00E-03
Nickel-63	13981-37-8	0.00E+00	0.00E+00	0.00E+00	1.00E+00	1.70E-02	1.00E+00	0.00E+00
Niobium-93m	4440-03-01[n]	5.59E-22	4.44E-18	0.00E+00	1.00E+00	2.80E-02	1.00E+00	2.00E-03
Plutonium-238	13981-16-3	6.34E-22	4.88E-18	5.49E+00	1.00E+00	1.10E-02	1.00E+00	2.00E-03
Plutonium-239	15117-48-3	5.61E-22	4.24E-18	5.15E+00	1.00E+00	7.00E-03	1.00E+00	0.00E+00
Plutonium-240	14119-33-6	6.20E-22	4.75E-18	5.16E+00	1.00E+00	1.10E-02	1.00E+00	2.00E-03
Plutonium-241	14119-32-5	9.60E-24	7.25E-20	0.00E+00	1.00E+00	5.00E-03	1.00E+00	0.00E+00

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	Internal							
		Gamma Absorption Factors Φ_γ^g							
		Plants	Soil Invertebrates	Mule Deer	Mourning Dove	Great Basin Pocket Mouse	Meadow-lark	Coyote	Burrowing Owl
Actinium-227	14952-40-0	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Americium-241	14596-10-2	2.70E-02	2.70E-02	3.00E-01	5.00E-02	5.00E-02	5.00E-02	3.40E-01	1.30E-01
Americium-243	14993-75-0	1.20E-02	1.20E-02	1.90E-01	1.60E+00	1.60E+00	1.60E+00	1.43E-01	6.50E-02
Antimony-125	14234-35-6	1.10E-02	1.10E-02	1.55E-01	1.50E-02	1.50E-02	1.50E-02	9.00E-02	4.00E-02
Barium-137m	13981-97-0	1.10E-02	1.10E-02	1.60E-01	1.60E-02	1.60E-02	1.60E-02	9.80E-02	4.00E-02
Cadmium-113m	14336-66-4	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Carbon-14	14762-75-5	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Cesium-134	13967-70-9	8.80E-03	8.80E-03	1.40E-01	1.10E-02	1.10E-02	1.10E-02	8.00E-02	3.40E-02
Cesium-137	10045-97-3	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Cobalt-60	10198-40-0	8.30E-03	8.30E-03	1.15E-01	1.00E-02	1.00E-02	1.00E-02	7.00E-02	1.00E-02
Curium-242	15510-73-3	6.30E-01	6.30E-01	9.40E-01	7.90E-01	7.90E-01	7.90E-01	9.40E-01	9.40E-01
Curium-243	15757-87-6	8.00E-03	8.00E-03	1.65E-01	1.20E-02	1.20E-02	1.20E-02	9.95E-02	4.00E-02
Curium-244	13981-15-2	6.30E-01	6.30E-01	9.40E-01	7.90E-01	7.90E-01	7.90E-01	9.40E-01	9.40E-01
Europium-152	14683-23-9	9.60E-02	9.60E-02	1.40E-01	1.30E-02	1.30E-02	1.30E-02	8.28E-02	3.90E-02
Europium-154	15585-10-1	9.40E-03	9.40E-03	1.35E-01	1.30E-02	1.30E-02	1.30E-02	1.00E-01	3.80E-02
Europium-155	14391-16-3	1.05E-02	1.05E-02	9.00E-02	1.60E-02	1.60E-02	1.60E-02	9.00E-02	5.30E-02
Iodine-129	15046-84-1	9.00E-02	9.00E-02	3.70E-01	1.30E-01	1.30E-01	1.30E-01	2.79E-01	1.70E-01
Neptunium-237	13994-20-2	2.75E-02	2.75E-02	2.95E-01	4.00E-02	4.00E-02	4.00E-02	3.00E-01	1.10E-01
Nickel-59	14336-70-0	6.30E-01	6.30E-01	9.40E-01	7.90E-01	7.90E-01	7.90E-01	9.40E-01	9.40E-01
Nickel-63	13981-37-8	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Niobium-93m	4440-03-01[n]	6.30E-01	6.30E-01	9.40E-01	7.90E-01	7.90E-01	7.90E-01	9.40E-01	9.40E-01
Plutonium-238	13981-16-3	6.30E-01	6.30E-01	9.40E-01	7.90E-01	7.90E-01	7.90E-01	9.40E-01	9.40E-01
Plutonium-239	15117-48-3	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Plutonium-240	14119-33-6	6.30E-01	6.30E-01	9.40E-01	7.90E-01	7.90E-01	7.90E-01	9.40E-01	9.40E-01
Plutonium-241	14119-32-5	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	Internal							
		Gamma Absorption Factors Φ_γ^g							
		Red-tailed Hawk	Benthic Invertebrates	Chinook Salmon	Canada Goose	Spotted Sandpiper	Great Blue Heron	Bald Eagle	Mink
Actinium-227	14952-40-0	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Americium-241	14596-10-2	1.30E-01	2.70E-02	3.40E-01	1.70E-01	5.00E-02	1.70E-01	1.70E-01	1.30E-01
Americium-243	14993-75-0	6.50E-02	1.20E-02	1.43E-01	9.50E-02	1.60E-02	9.50E-02	9.50E-02	6.50E-02
Antimony-125	14234-35-6	4.00E-02	1.10E-02	9.00E-02	6.00E-02	1.50E-02	6.00E-02	6.00E-02	4.00E-02
Barium-137m	13981-97-0	4.00E-02	1.20E-02	9.80E-02	6.00E-02	1.60E-02	6.00E-02	6.00E-02	4.00E-02
Cadmium-113m	14336-66-4	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Carbon-14	14762-75-5	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Cesium-134	13967-70-9	3.40E-02	8.80E-03	8.00E-02	5.00E-02	1.10E-02	5.00E-02	5.00E-02	3.40E-02
Cesium-137	10045-97-3	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Cobalt-60	10198-40-0	1.00E-02	8.30E-03	7.00E-02	3.00E-02	1.00E-02	3.00E-02	3.00E-02	1.00E-02
Curium-242	15510-73-3	9.40E-01	6.30E-01	9.40E-01	9.40E-01	7.90E-01	9.40E-01	9.40E-01	9.40E-01
Curium-243	15757-87-6	4.00E-02	8.00E-03	9.95E-02	6.00E-02	1.20E-02	6.00E-02	6.00E-02	4.00E-02
Curium-244	13981-15-2	9.40E-01	6.30E-01	9.40E-01	9.40E-01	7.90E-01	9.40E-01	9.40E-01	9.40E-01
Europium-152	14683-23-9	3.90E-02	9.60E-02	8.28E-02	4.90E-02	1.30E-02	4.90E-02	4.90E-02	3.90E-02
Europium-154	15585-10-1	3.80E-02	9.40E-03	1.00E-01	4.80E-02	1.30E-02	4.80E-02	4.80E-02	3.80E-02
Europium-155	14391-16-3	5.30E-02	1.05E-02	9.00E-02	8.00E-02	1.60E-02	8.00E-02	8.00E-02	5.30E-02
Iodine-129	15046-84-1	1.70E-01	9.00E-02	2.79E-01	2.10E-01	1.30E-01	2.10E-01	2.10E-01	1.70E-01
Neptunium-237	13994-20-2	1.10E-01	2.75E-02	3.00E-01	1.55E-01	4.00E-02	1.55E-01	1.55E-01	1.10E-01
Nickel-59	14336-70-0	9.40E-01	6.30E-01	9.40E-01	9.40E-01	7.90E-01	9.40E-01	9.40E-01	9.40E-01
Nickel-63	13981-37-8	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Niobium-93m	4440-03-01[n]	9.40E-01	6.30E-01	9.40E-01	9.40E-01	7.90E-01	9.40E-01	9.40E-01	9.40E-01
Plutonium-238	13981-16-3	9.40E-01	6.30E-01	9.40E-01	9.40E-01	7.90E-01	9.40E-01	9.40E-01	9.40E-01
Plutonium-239	15117-48-3	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Plutonium-240	14119-33-6	9.40E-01	6.30E-01	9.40E-01	9.40E-01	7.90E-01	9.40E-01	9.40E-01	9.40E-01
Plutonium-241	14119-32-5	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	Dose Factors								
		Plants			Soil Invertebrates			Mule Deer		
		External Soil[i]	External Air[j]	Internal[k]	External Soil[i]	External Air[j]	Internal[k]	External Soil[i]	External Air[j]	Internal[k]
Actinium-227	14952-40-0	2.76E-10	1.86E-12	1.82E-05	2.76E-10	1.86E-12	1.82E-05	2.76E-10	1.86E-12	1.82E-05
Americium-241	14596-10-2	5.65E-06	2.62E-10	1.40E-03	5.65E-06	2.62E-10	1.40E-03	4.12E-08	2.62E-10	1.40E-03
Americium-243	14993-75-0	4.34E-06	6.98E-10	1.35E-03	4.34E-06	6.98E-10	1.35E-03	1.06E-07	6.98E-10	1.35E-03
Antimony-125	14234-35-6	3.08E-05	6.46E-09	5.35E-06	3.08E-05	6.46E-09	5.35E-06	9.57E-07	6.46E-09	8.52E-06
Barium-137m	13981-97-0	4.27E-05	9.22E-09	3.66E-06	4.27E-05	9.22E-09	3.66E-06	1.35E-06	9.22E-09	8.20E-06
Cadmium-113m	14336-66-4	9.39E-11	4.64E-13	4.75E-06	9.39E-11	4.64E-13	4.75E-06	9.39E-11	4.64E-13	4.75E-06
Carbon-14	14762-75-5	1.54E-11	7.17E-14	2.50E-06	1.54E-11	7.17E-14	2.50E-06	1.54E-11	7.17E-14	2.50E-06
Cesium-134	13967-70-9	8.97E-05	2.42E-08	9.08E-06	8.97E-05	2.42E-08	9.08E-06	3.51E-06	2.42E-08	1.95E-05
Cesium-137	10045-97-3	4.80E-10	2.48E-12	9.56E-06	4.80E-10	2.48E-12	9.56E-06	4.80E-10	2.48E-12	9.56E-06
Cobalt-60	10198-40-0	1.36E-04	4.03E-08	6.02E-06	1.36E-04	4.03E-08	6.02E-06	5.45E-06	4.03E-08	1.97E-05
Curium-242	15510-73-3	7.94E-06	1.82E-12	1.56E-03	7.94E-06	1.82E-12	1.56E-03	2.72E-10	1.82E-12	1.56E-03
Curium-243	15757-87-6	7.03E-06	1.88E-09	1.49E-03	7.03E-06	1.88E-09	1.49E-03	2.79E-07	1.88E-09	1.49E-03
Curium-244	13981-15-2	7.94E-06	1.57E-12	1.48E-03	7.94E-06	1.57E-12	1.48E-03	2.34E-10	1.57E-12	1.48E-03
Europium-152	14683-23-9	7.01E-04	1.81E-08	1.28E-05	7.01E-04	1.81E-08	1.28E-05	2.52E-06	1.81E-08	1.54E-05
Europium-154	15585-10-1	7.62E-05	1.96E-08	1.55E-05	7.62E-05	1.96E-08	1.55E-05	2.73E-06	1.96E-08	2.35E-05
Europium-155	14391-16-3	4.16E-06	7.97E-10	3.25E-06	4.16E-06	7.97E-10	3.25E-06	1.21E-07	7.97E-10	3.50E-06
Iodine-129	15046-84-1	1.42E-05	1.22E-10	3.39E-06	1.42E-05	1.22E-10	3.39E-06	2.13E-08	1.22E-10	3.74E-06
Neptunium-237	13994-20-2	6.11E-06	3.30E-10	1.22E-03	6.11E-06	3.30E-10	1.22E-03	4.95E-08	3.30E-10	1.22E-03
Nickel-59	14336-70-0	7.94E-06	0.00E+00	3.20E-07	7.94E-06	0.00E+00	3.20E-07	0.00E+00	0.00E+00	3.52E-07
Nickel-63	13981-37-8	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07
Niobium-93m	4440-03-01[n]	7.94E-06	1.42E-12	1.50E-06	7.94E-06	1.42E-12	1.50E-06	2.00E-10	1.42E-12	1.53E-06
Plutonium-238	13981-16-3	7.94E-06	1.56E-12	1.40E-03	7.94E-06	1.56E-12	1.40E-03	2.27E-10	1.56E-12	1.40E-03
Plutonium-239	15117-48-3	2.01E-10	1.36E-12	1.32E-03	2.01E-10	1.36E-12	1.32E-03	2.01E-10	1.36E-12	1.32E-03
Plutonium-240	14119-33-6	7.94E-06	1.52E-12	1.32E-03	7.94E-06	1.52E-12	1.32E-03	2.22E-10	1.52E-12	1.32E-03
Plutonium-241	14119-32-5	3.44E-12	2.32E-14	2.56E-07	3.44E-12	2.32E-14	2.56E-07	3.44E-12	2.32E-14	2.56E-07

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	Dose Factors								
		Mourning Dove			Great Basin Pocket Mouse			Meadowlark		
		External Soil[i]	External Air[j]	Internal[k]	External Soil[i]	External Air[j]	Internal[k]	External Soil[i]	External Air[j]	Internal[k]
Actinium-227	14952-40-0	5.52E-10	1.86E-12	1.82E-05	1.66E-10	1.86E-12	1.82E-05	5.52E-10	1.86E-12	1.82E-05
Americium-241	14596-10-2	8.24E-08	2.62E-10	1.40E-03	1.46E-05	2.62E-10	1.40E-03	8.24E-08	2.62E-10	1.40E-03
Americium-243	14993-75-0	2.12E-07	6.98E-10	1.35E-03	7.90E-04	6.98E-10	1.35E-03	2.12E-07	6.98E-10	1.35E-03
Antimony-125	14234-35-6	1.91E-06	6.46E-09	5.44E-06	5.76E-05	6.46E-09	5.44E-06	1.91E-06	6.46E-09	5.44E-06
Barium-137m	13981-97-0	2.70E-06	9.22E-09	3.81E-06	8.51E-05	9.22E-09	3.81E-06	2.70E-06	9.22E-09	3.81E-06
Cadmium-113m	14336-66-4	1.88E-10	4.64E-13	4.75E-06	5.63E-11	4.64E-13	4.75E-06	1.88E-10	4.64E-13	4.75E-06
Carbon-14	14762-75-5	3.08E-11	7.17E-14	2.50E-06	9.25E-12	7.17E-14	2.50E-06	3.08E-11	7.17E-14	2.50E-06
Cesium-134	13967-70-9	7.01E-06	2.42E-08	9.25E-06	1.53E-04	2.42E-08	9.25E-06	7.01E-06	2.42E-08	9.25E-06
Cesium-137	10045-97-3	9.61E-10	2.48E-12	9.56E-06	2.88E-10	2.48E-12	9.56E-06	9.61E-10	2.48E-12	9.56E-06
Cobalt-60	10198-40-0	1.09E-05	4.03E-08	6.24E-06	2.24E-04	4.03E-08	6.24E-06	1.09E-05	4.03E-08	6.24E-06
Curium-242	15510-73-3	5.44E-10	1.82E-12	1.56E-03	1.39E-05	1.82E-12	1.56E-03	5.44E-10	1.82E-12	1.56E-03
Curium-243	15757-87-6	5.58E-07	1.88E-09	1.49E-03	1.44E-05	1.88E-09	1.49E-03	5.58E-07	1.88E-09	1.49E-03
Curium-244	13981-15-2	4.69E-10	1.57E-12	1.48E-03	1.39E-05	1.57E-12	1.48E-03	4.69E-10	1.57E-12	1.48E-03
Europium-152	14683-23-9	5.04E-06	1.81E-08	7.87E-06	1.34E-04	1.81E-08	7.87E-06	5.04E-06	1.81E-08	7.87E-06
Europium-154	15585-10-1	5.46E-06	1.96E-08	1.57E-05	1.44E-04	1.96E-08	1.57E-05	5.46E-06	1.96E-08	1.57E-05
Europium-155	14391-16-3	2.42E-07	7.97E-10	3.27E-06	8.68E-06	7.97E-10	3.27E-06	2.42E-07	7.97E-10	3.27E-06
Iodine-129	15046-84-1	4.26E-08	1.22E-10	3.44E-06	2.87E-05	1.22E-10	3.44E-06	4.26E-08	1.22E-10	3.44E-06
Neptunium-237	13994-20-2	9.89E-08	3.30E-10	1.22E-03	1.24E-05	3.30E-10	1.22E-03	9.89E-08	3.30E-10	1.22E-03
Nickel-59	14336-70-0	0.00E+00	0.00E+00	3.36E-07	1.39E-05	0.00E+00	3.36E-07	0.00E+00	0.00E+00	3.36E-07
Nickel-63	13981-37-8	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07
Niobium-93m	4440-03-01[n]	4.01E-10	1.42E-12	1.51E-06	1.39E-05	1.42E-12	1.51E-06	4.01E-10	1.42E-12	1.51E-06
Plutonium-238	13981-16-3	4.54E-10	1.56E-12	1.40E-03	1.39E-05	1.56E-12	1.40E-03	4.54E-10	1.56E-12	1.40E-03
Plutonium-239	15117-48-3	4.02E-10	1.36E-12	1.32E-03	1.21E-10	1.36E-12	1.32E-03	4.02E-10	1.36E-12	1.32E-03
Plutonium-240	14119-33-6	4.44E-10	1.52E-12	1.32E-03	1.39E-05	1.52E-12	1.32E-03	4.44E-10	1.52E-12	1.32E-03
Plutonium-241	14119-32-5	6.88E-12	2.32E-14	2.56E-07	2.06E-12	2.32E-14	2.56E-07	6.88E-12	2.32E-14	2.56E-07

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	Dose Factors								
		Coyote			Burrowing Owl			Red-tailed Hawk		
		External Soil[i]	External Air[j]	Internal[k]	External Soil[i]	External Air[j]	Internal[k]	External Soil[i]	External Air[j]	Internal[k]
Actinium-227	14952-40-0	3.86E-10	1.86E-12	1.82E-05	2.76E-10	1.86E-12	1.82E-05	2.76E-11	1.86E-12	1.82E-05
Americium-241	14596-10-2	4.25E-05	2.62E-10	1.40E-03	2.71E-05	2.62E-10	1.40E-03	4.12E-09	2.62E-10	1.40E-03
Americium-243	14993-75-0	3.04E-05	6.98E-10	1.35E-03	2.30E-05	6.98E-10	1.35E-03	1.06E-08	6.98E-10	1.35E-03
Antimony-125	14234-35-6	1.48E-04	6.46E-09	7.09E-06	1.10E-04	6.46E-09	5.99E-06	9.57E-08	6.46E-09	5.99E-06
Barium-137m	13981-97-0	2.23E-04	9.22E-09	6.31E-06	1.52E-04	9.22E-09	4.54E-06	1.35E-07	9.22E-09	4.54E-06
Cadmium-113m	14336-66-4	1.31E-10	4.64E-13	4.75E-06	9.39E-11	4.64E-13	4.75E-06	9.39E-12	4.64E-13	4.75E-06
Carbon-14	14762-75-5	2.16E-11	7.17E-14	2.50E-06	1.54E-11	7.17E-14	2.50E-06	1.54E-12	7.17E-14	2.50E-06
Cesium-134	13967-70-9	4.75E-04	2.42E-08	1.47E-05	3.37E-04	2.42E-08	1.11E-05	3.51E-07	2.42E-08	1.11E-05
Cesium-137	10045-97-3	6.72E-10	2.48E-12	9.56E-06	4.80E-10	2.48E-12	9.56E-06	4.80E-11	2.48E-12	9.56E-06
Cobalt-60	10198-40-0	6.70E-04	4.03E-08	1.39E-05	1.63E-04	4.03E-08	6.24E-06	5.45E-07	4.03E-08	6.24E-06
Curium-242	15510-73-3	7.11E-06	1.82E-12	1.56E-03	1.18E-05	1.82E-12	1.56E-03	2.72E-11	1.82E-12	1.56E-03
Curium-243	15757-87-6	5.08E-05	1.88E-09	1.49E-03	3.40E-05	1.88E-09	1.49E-03	2.79E-08	1.88E-09	1.49E-03
Curium-244	13981-15-2	7.11E-06	1.57E-12	1.48E-03	1.18E-05	1.57E-12	1.48E-03	2.34E-11	1.57E-12	1.48E-03
Europium-152	14683-23-9	3.65E-04	1.81E-08	1.20E-05	2.86E-04	1.81E-08	9.40E-06	2.52E-07	1.81E-08	9.40E-06
Europium-154	15585-10-1	4.73E-04	1.96E-08	2.13E-05	3.00E-04	1.96E-08	1.73E-05	2.73E-07	1.96E-08	1.73E-05
Europium-155	14391-16-3	2.09E-05	7.97E-10	3.50E-06	2.05E-05	7.97E-10	3.38E-06	1.21E-08	7.97E-10	3.38E-06
Iodine-129	15046-84-1	2.64E-05	1.22E-10	3.63E-06	2.68E-05	1.22E-10	3.49E-06	2.13E-09	1.22E-10	3.49E-06
Neptunium-237	13994-20-2	3.98E-05	3.30E-10	1.22E-03	2.43E-05	3.30E-10	1.22E-03	4.95E-09	3.30E-10	1.22E-03
Nickel-59	14336-70-0	7.11E-06	0.00E+00	3.52E-07	1.18E-05	0.00E+00	3.52E-07	0.00E+00	0.00E+00	3.52E-07
Nickel-63	13981-37-8	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07
Niobium-93m	4440-03-01[n]	7.11E-06	1.42E-12	1.53E-06	1.18E-05	1.42E-12	1.53E-06	2.00E-11	1.42E-12	1.53E-06
Plutonium-238	13981-16-3	7.11E-06	1.56E-12	1.40E-03	1.18E-05	1.56E-12	1.40E-03	2.27E-11	1.56E-12	1.40E-03
Plutonium-239	15117-48-3	2.81E-10	1.36E-12	1.32E-03	2.01E-10	1.36E-12	1.32E-03	2.01E-11	1.36E-12	1.32E-03
Plutonium-240	14119-33-6	7.11E-06	1.52E-12	1.32E-03	1.18E-05	1.52E-12	1.32E-03	2.22E-11	1.52E-12	1.32E-03
Plutonium-241	14119-32-5	4.82E-12	2.32E-14	2.56E-07	3.44E-12	2.32E-14	2.56E-07	3.44E-13	2.32E-14	2.56E-07

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	Dose Factors								
		Benthic Invertebrates			Aquatic Biota, Including Salmonids			Canada Goose		
		External Water[l]	External Sediment[m]	Internal[k]	External Water[l]	External Sediment[m]	Internal[k]	External Water[l]	External Air[j]	Internal[k]
Actinium-227	14952-40-0	0.00E+00	0.00E+00	1.82E-05	0.00E+00	0.00E+00	1.82E-05	0.00E+00	1.86E-12	1.82E-05
Americium-241	14596-10-2	1.64E-10	1.48E-06	1.40E-03	1.00E-09	5.58E-08	1.40E-03	7.01E-10	2.62E-10	1.40E-03
Americium-243	14993-75-0	2.83E-10	2.55E-06	1.35E-03	2.21E-09	1.23E-07	1.35E-03	1.30E-09	6.98E-10	1.35E-03
Antimony-125	14234-35-6	2.18E-09	1.96E-05	5.35E-06	1.81E-08	1.00E-06	7.09E-06	1.04E-08	6.46E-09	6.43E-06
Barium-137m	13981-97-0	3.02E-09	2.72E-05	3.69E-06	2.48E-08	1.38E-06	6.31E-06	1.44E-08	9.22E-09	5.15E-06
Cadmium-113m	14336-66-4	0.00E+00	0.00E+00	4.75E-06	0.00E+00	0.00E+00	4.75E-06	0.00E+00	4.64E-13	4.75E-06
Carbon-14	14762-75-5	0.00E+00	0.00E+00	2.50E-06	0.00E+00	0.00E+00	2.50E-06	0.00E+00	7.17E-14	2.50E-06
Cesium-134	13967-70-9	7.89E-09	7.10E-05	9.08E-06	6.59E-08	3.66E-06	1.47E-05	3.78E-08	2.42E-08	1.24E-05
Cesium-137	10045-97-3	0.00E+00	0.00E+00	9.56E-06	0.00E+00	0.00E+00	9.56E-06	0.00E+00	2.48E-12	9.56E-06
Cobalt-60	10198-40-0	1.27E-08	1.14E-04	6.02E-06	1.07E-07	5.96E-06	1.39E-05	6.22E-08	4.03E-08	8.80E-06
Curium-242	15510-73-3	3.79E-12	3.41E-08	1.56E-03	5.53E-12	3.07E-10	1.56E-03	3.07E-12	1.82E-12	1.56E-03
Curium-243	15757-87-6	6.81E-10	6.13E-06	1.49E-03	5.56E-09	3.09E-07	1.49E-03	3.22E-09	1.88E-09	1.49E-03
Curium-244	13981-15-2	3.79E-12	3.41E-08	1.48E-03	5.53E-12	3.07E-10	1.48E-03	3.07E-12	1.57E-12	1.48E-03
Europium-152	14683-23-9	5.35E-09	4.81E-05	1.28E-05	4.88E-08	2.71E-06	1.20E-05	2.81E-08	1.81E-08	9.99E-06
Europium-154	15585-10-1	6.29E-09	5.66E-05	1.55E-05	5.15E-08	2.86E-06	2.13E-05	3.02E-08	1.96E-08	1.80E-05
Europium-155	14391-16-3	3.09E-10	2.78E-06	3.25E-06	2.56E-09	1.42E-07	3.50E-06	1.44E-09	7.97E-10	3.47E-06
Iodine-129	15046-84-1	1.16E-10	1.05E-06	3.39E-06	8.31E-10	4.62E-08	3.63E-06	5.06E-10	1.22E-10	3.54E-06
Neptunium-237	13994-20-2	1.74E-10	1.57E-06	1.22E-03	1.13E-09	6.27E-08	1.22E-03	7.57E-10	3.30E-10	1.22E-03
Nickel-59	14336-70-0	3.79E-12	3.41E-08	3.20E-07	5.53E-12	3.07E-10	3.52E-07	3.07E-12	0.00E+00	3.52E-07
Nickel-63	13981-37-8	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07
Niobium-93m	4440-03-01[n]	3.79E-12	3.41E-08	1.50E-06	5.53E-12	3.07E-10	1.53E-06	3.07E-12	1.42E-12	1.53E-06
Plutonium-238	13981-16-3	3.79E-12	3.41E-08	1.40E-03	5.53E-12	3.07E-10	1.40E-03	3.07E-12	1.56E-12	1.40E-03
Plutonium-239	15117-48-3	0.00E+00	0.00E+00	1.32E-03	0.00E+00	0.00E+00	1.32E-03	0.00E+00	1.36E-12	1.32E-03
Plutonium-240	14119-33-6	3.79E-12	3.41E-08	1.32E-03	5.53E-12	3.07E-10	1.32E-03	3.07E-12	1.52E-12	1.32E-03
Plutonium-241	14119-32-5	0.00E+00	0.00E+00	2.56E-07	0.00E+00	0.00E+00	2.56E-07	0.00E+00	2.32E-14	2.56E-07

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	Dose Factors										
		Spotted Sandpiper				Great Blue Heron				Bald Eagle		
		External Water[l]	External Sediment[m]	External Air[j]	Internal[k]	External Water[l]	External Sediment[m]	External Air[j]	Internal[k]	External Water[l]	External Air[j]	Internal[k]
Actinium-227	14952-40-0	0.00E+00	0.00E+00	1.86E-12	1.82E-05	0.00E+00	0.00E+00	1.86E-12	1.82E-05	0.00E+00	1.86E-12	1.82E-05
Americium-241	14596-10-2	8.03E-10	4.82E-07	2.62E-10	1.40E-03	7.01E-10	2.80E-07	2.62E-10	1.40E-03	7.01E-11	2.62E-10	1.40E-03
Americium-243	14993-75-0	1.41E-09	8.46E-07	6.98E-10	1.35E-03	1.30E-09	5.19E-07	6.98E-10	1.35E-03	1.30E-10	6.98E-10	1.35E-03
Antimony-125	14234-35-6	1.09E-08	6.52E-06	6.46E-09	5.44E-06	1.04E-08	4.15E-06	6.46E-09	6.43E-06	1.04E-09	6.46E-09	6.43E-06
Barium-137m	13981-97-0	1.50E-08	9.02E-06	9.22E-09	3.81E-06	1.44E-08	5.75E-06	9.22E-09	5.15E-06	1.44E-09	9.22E-09	5.15E-06
Cadmium-113m	14336-66-4	0.00E+00	0.00E+00	4.64E-13	4.75E-06	0.00E+00	0.00E+00	4.64E-13	4.75E-06	0.00E+00	4.64E-13	4.75E-06
Carbon-14	14762-75-5	0.00E+00	0.00E+00	7.17E-14	2.50E-06	0.00E+00	0.00E+00	7.17E-14	2.50E-06	0.00E+00	7.17E-14	2.50E-06
Cesium-134	13967-70-9	3.94E-08	2.36E-05	2.42E-08	9.25E-06	3.78E-08	1.51E-05	2.42E-08	1.24E-05	3.78E-09	2.42E-08	1.24E-05
Cesium-137	10045-97-3	0.00E+00	0.00E+00	2.48E-12	9.56E-06	0.00E+00	0.00E+00	2.48E-12	9.56E-06	0.00E+00	2.48E-12	9.56E-06
Cobalt-60	10198-40-0	6.35E-08	3.81E-05	4.03E-08	6.24E-06	6.22E-08	2.49E-05	4.03E-08	8.80E-06	6.22E-09	4.03E-08	8.80E-06
Curium-242	15510-73-3	1.08E-11	6.45E-09	1.82E-12	1.56E-03	3.07E-12	1.23E-09	1.82E-12	1.56E-03	3.07E-13	1.82E-12	1.56E-03
Curium-243	15757-87-6	3.39E-09	2.03E-06	1.88E-09	1.49E-03	3.22E-09	1.29E-06	1.88E-09	1.49E-03	3.22E-10	1.88E-09	1.49E-03
Curium-244	13981-15-2	1.08E-11	6.45E-09	1.57E-12	1.48E-03	3.07E-12	1.23E-09	1.57E-12	1.48E-03	3.07E-13	1.57E-12	1.48E-03
Europium-152	14683-23-9	2.92E-08	1.75E-05	1.81E-08	7.87E-06	2.81E-08	1.12E-05	1.81E-08	9.99E-06	2.81E-09	1.81E-08	9.99E-06
Europium-154	15585-10-1	3.14E-08	1.88E-05	1.96E-08	1.57E-05	3.02E-08	1.21E-05	1.96E-08	1.80E-05	3.02E-09	1.96E-08	1.80E-05
Europium-155	14391-16-3	1.54E-09	9.22E-07	7.97E-10	3.27E-06	1.44E-09	5.75E-07	7.97E-10	3.47E-06	1.44E-10	7.97E-10	3.47E-06
Iodine-129	15046-84-1	5.57E-10	3.34E-07	1.22E-10	3.44E-06	5.06E-10	2.02E-07	1.22E-10	3.54E-06	5.06E-11	1.22E-10	3.54E-06
Neptunium-237	13994-20-2	8.60E-10	5.16E-07	3.30E-10	1.22E-03	7.57E-10	3.03E-07	3.30E-10	1.22E-03	7.57E-11	3.30E-10	1.22E-03
Nickel-59	14336-70-0	1.08E-11	6.45E-09	0.00E+00	3.36E-07	3.07E-12	1.23E-09	0.00E+00	3.52E-07	3.07E-13	0.00E+00	3.52E-07
Nickel-63	13981-37-8	0.00E+00	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07
Niobium-93m	4440-03-01[n]	1.08E-11	6.45E-09	1.42E-12	1.51E-06	3.07E-12	1.23E-09	1.42E-12	1.53E-06	3.07E-13	1.42E-12	1.53E-06
Plutonium-238	13981-16-3	1.08E-11	6.45E-09	1.56E-12	1.40E-03	3.07E-12	1.23E-09	1.56E-12	1.40E-03	3.07E-13	1.56E-12	1.40E-03
Plutonium-239	15117-48-3	0.00E+00	0.00E+00	1.36E-12	1.32E-03	0.00E+00	0.00E+00	1.36E-12	1.32E-03	0.00E+00	1.36E-12	1.32E-03
Plutonium-240	14119-33-6	1.08E-11	6.45E-09	1.52E-12	1.32E-03	3.07E-12	1.23E-09	1.52E-12	1.32E-03	3.07E-13	1.52E-12	1.32E-03
Plutonium-241	14119-32-5	0.00E+00	0.00E+00	2.32E-14	2.56E-07	0.00E+00	0.00E+00	2.32E-14	2.56E-07	0.00E+00	2.32E-14	2.56E-07

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	Dose Factors		
		Mink		
		External Water[i]	External Air[j]	Internal[k]
Actinium-227	14952-40-0	0.00E+00	1.86E-12	1.82E-05
Americium-241	14596-10-2	2.94E-10	2.62E-10	1.40E-03
Americium-243	14993-75-0	5.36E-10	6.98E-10	1.35E-03
Antimony-125	14234-35-6	4.24E-09	6.46E-09	5.99E-06
Barium-137m	13981-97-0	5.87E-09	9.22E-09	4.54E-06
Cadmium-113m	14336-66-4	0.00E+00	4.64E-13	4.75E-06
Carbon-14	14762-75-5	0.00E+00	7.17E-14	2.50E-06
Cesium-134	13967-70-9	1.54E-08	2.42E-08	1.11E-05
Cesium-137	10045-97-3	0.00E+00	2.48E-12	9.56E-06
Cobalt-60	10198-40-0	2.54E-08	4.03E-08	6.24E-06
Curium-242	15510-73-3	1.23E-12	1.82E-12	1.56E-03
Curium-243	15757-87-6	1.32E-09	1.88E-09	1.49E-03
Curium-244	13981-15-2	1.23E-12	1.57E-12	1.48E-03
Europium-152	14683-23-9	1.14E-08	1.81E-08	9.40E-06
Europium-154	15585-10-1	1.22E-08	1.96E-08	1.73E-05
Europium-155	14391-16-3	5.92E-10	7.97E-10	3.38E-06
Iodine-129	15046-84-1	2.12E-10	1.22E-10	3.49E-06
Neptunium-237	13994-20-2	3.19E-10	3.30E-10	1.22E-03
Nickel-59	14336-70-0	1.23E-12	0.00E+00	3.52E-07
Nickel-63	13981-37-8	0.00E+00	0.00E+00	8.69E-07
Niobium-93m	4440-03-01[n]	1.23E-12	1.42E-12	1.53E-06
Plutonium-238	13981-16-3	1.23E-12	1.56E-12	1.40E-03
Plutonium-239	15117-48-3	0.00E+00	1.36E-12	1.32E-03
Plutonium-240	14119-33-6	1.23E-12	1.52E-12	1.32E-03
Plutonium-241	14119-32-5	0.00E+00	2.32E-14	2.56E-07

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	External DCF[a]		Internal				
				Decay Energies and Absorption Factors				
		Untilled Soil[b]	Air[c]	$E_\alpha n_\alpha$[d]	Φ_α[e]	$E_\beta n_\beta$[f]	Φ_β[g]	$E_\gamma n_\gamma$[h]
Plutonium-242	13982-10-0	5.23E-22	4.01E-18	4.89E+00	1.00E+00	9.00E-03	1.00E+00	1.00E-03
Protactinium-231	14331-85-2	2.30E-19	1.72E-15	4.97E+00	1.00E+00	6.50E-02	1.00E+00	4.80E-02
Radium-226	13982-63-3	4.15E-20	3.15E-16	4.77E+00	1.00E+00	4.00E-03	1.00E+00	7.00E-03
Radium-228	15262-20-1	0.00E+00	0.00E+00	0.00E+00	1.00E+00	1.70E-02	1.00E+00	0.00E+00
Ruthenium-106	13967-48-1	0.00E+00	0.00E+00	0.00E+00	1.00E+00	1.00E-02	1.00E+00	0.00E+00
Samarium-151	15715-94-3	5.22E-24	3.61E-20	0.00E+00	1.00E+00	2.00E-02	1.00E+00	0.00E+00
Selenium-79	15758-45-9	5.77E-23	3.03E-19	0.00E+00	1.00E+00	5.60E-02	1.00E+00	0.00E+00
Strontium-90	10098-97-2	1.31E-21	7.53E-18	0.00E+00	1.00E+00	1.96E-01	1.00E+00	0.00E+00
Technetium-99	14133-79-7	2.92E-22	1.62E-18	0.00E+00	1.00E+00	1.01E-01	1.00E+00	0.00E+00
Thorium-229	15594-54-4	5.09E-19	3.83E-15	4.87E+00	1.00E+00	1.16E-01	1.00E+00	9.60E-02
Thorium-232	7440-29-1	1.16E-21	8.72E-18	4.00E+00	1.00E+00	1.20E-02	1.00E+00	1.00E-03
Tin-126	15832-50-5	2.85E-19	2.11E-15	0.00E+00	1.00E+00	1.72E-01	1.00E+00	5.70E-02
Tritium	10028-17-8	0.00E+00	3.31E-19	0.00E+00	1.00E+00	6.00E-03	1.00E+00	0.00E+00
Uranium-232	14158-29-3	1.88E-21	1.42E-17	5.30E+00	1.00E+00	1.70E-02	1.00E+00	2.00E-03
Uranium-233	13968-55-3	2.16E-21	1.63E-17	4.82E+00	1.00E+00	6.00E-03	1.00E+00	1.00E-03
Uranium-234	13966-29-5	1.01E-21	7.63E-18	4.76E+00	1.00E+00	1.30E-02	1.00E+00	2.00E-03
Uranium-235	15117-96-1	9.49E-19	7.20E-15	4.40E+00	1.00E+00	4.90E-02	1.00E+00	1.56E-01
Uranium-236	13982-70-2	6.53E-22	5.01E-18	4.51E+00	1.00E+00	1.10E-02	1.00E+00	2.00E-03
Uranium-238	7440-61-1	4.42E-22	3.41E-18	4.19E+00	1.00E+00	1.00E-02	1.00E+00	1.00E-03
Yttrium-90	10098-91-6	3.10E-20	1.90E-16	0.00E+00	1.00E+00	9.35E-01	1.00E+00	0.00E+00
Zirconium-93	15751-77-6	0.00E+00	0.00E+00	0.00E+00	1.00E+00	2.00E-02	1.00E+00	0.00E+00

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	Internal							
		Gamma Absorption Factors Φ_γ^β							
		Plants	Soil Invertebrates	Mule Deer	Mourning Dove	Great Basin Pocket Mouse	Meadow-lark	Coyote	Burrowing Owl
Plutonium-242	13982-10-0	6.30E-01	6.30E-01	9.40E-01	7.90E-01	7.90E-01	7.90E-01	9.40E-01	9.40E-01
Protactinium-231	14331-85-2	1.30E-02	1.30E-02	2.00E-01	1.85E-02	1.85E-02	1.85E-02	1.80E-01	6.00E-02
Radium-226	13982-63-3	6.30E-01	6.30E-01	9.30E-01	7.90E-01	7.90E-01	7.90E-01	9.40E-01	9.30E-01
Radium-228	15262-20-1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Ruthenium-106	13967-48-1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Samarium-151	15715-94-3	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Selenium-79	15758-45-9	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Strontium-90	10098-97-2	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Technetium-99	14133-79-7	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Thorium-229	15594-54-4	8.50E-03	8.50E-03	1.70E-01	1.35E-02	1.35E-02	1.35E-02	8.00E-02	4.40E-02
Thorium-232	7440-29-1	6.30E-01	6.30E-01	9.40E-01	7.90E-01	7.90E-01	7.90E-01	9.40E-01	9.40E-01
Tin-126	15832-50-5	1.20E-02	1.20E-02	1.90E-01	1.65E-02	1.65E-02	1.65E-02	1.27E-01	5.50E-02
Tritium	10028-17-8	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Uranium-232	14158-29-3	6.30E-01	6.30E-01	9.40E-01	7.90E-01	7.90E-01	7.90E-01	9.40E-01	9.40E-01
Uranium-233	13968-55-3	6.30E-01	6.30E-01	9.40E-01	7.90E-01	7.90E-01	7.90E-01	9.40E-01	9.40E-01
Uranium-234	13966-29-5	6.30E-01	6.30E-01	9.40E-01	7.90E-01	7.90E-01	7.90E-01	9.40E-01	9.40E-01
Uranium-235	15117-96-1	8.00E-03	8.00E-03	1.50E-01	1.15E-02	1.15E-02	1.15E-02	9.49E-02	4.00E-02
Uranium-236	13982-70-2	6.30E-01	6.30E-01	9.40E-01	7.90E-01	7.90E-01	7.90E-01	9.40E-01	9.40E-01
Uranium-238	7440-61-1	6.30E-01	6.30E-01	9.40E-01	7.90E-01	7.90E-01	7.90E-01	9.40E-01	9.40E-01
Yttrium-90	10098-91-6	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Zirconium-93	15751-77-6	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	Internal							
		Gamma Absorption Factors Φ_γ^E							
		Red-tailed Hawk	Benthic Invertebrates	Chinook Salmon	Canada Goose	Spotted Sandpiper	Great Blue Heron	Bald Eagle	Mink
Plutonium-242	13982-10-0	9.40E-01	6.30E-01	9.40E-01	9.40E-01	7.90E-01	9.40E-01	9.40E-01	9.40E-01
Protactinium-231	14331-85-2	6.00E-02	1.30E-02	1.80E-01	9.00E-02	1.85E-02	9.00E-02	9.00E-02	6.00E-02
Radium-226	13982-63-3	9.30E-01	6.30E-01	9.40E-01	9.30E-01	7.90E-01	9.30E-01	9.30E-01	9.30E-01
Radium-228	15262-20-1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Ruthenium-106	13967-48-1	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Samarium-151	15715-94-3	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Selenium-79	15758-45-9	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Strontium-90	10098-97-2	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Technetium-99	14133-79-7	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Thorium-229	15594-54-4	4.40E-02	8.50E-03	8.00E-02	6.60E-02	1.35E-02	6.60E-02	6.60E-02	4.40E-02
Thorium-232	7440-29-1	9.40E-01	6.30E-01	9.40E-01	9.40E-01	7.90E-01	9.40E-01	9.40E-01	9.40E-01
Tin-126	15832-50-5	5.50E-02	1.20E-02	1.27E-01	8.50E-02	1.65E-02	8.50E-02	8.50E-02	5.50E-02
Tritium	10028-17-8	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Uranium-232	14158-29-3	9.40E-01	6.30E-01	9.40E-01	9.40E-01	7.90E-01	9.40E-01	9.40E-01	9.40E-01
Uranium-233	13968-55-3	9.40E-01	6.30E-01	9.40E-01	9.40E-01	7.90E-01	9.40E-01	9.40E-01	9.40E-01
Uranium-234	13966-29-5	9.40E-01	6.30E-01	9.40E-01	9.40E-01	7.90E-01	9.40E-01	9.40E-01	9.40E-01
Uranium-235	15117-96-1	4.00E-02	8.00E-03	9.49E-02	6.00E-02	1.15E-02	6.00E-02	6.00E-02	4.00E-02
Uranium-236	13982-70-2	9.40E-01	6.30E-01	9.40E-01	9.40E-01	7.90E-01	9.40E-01	9.40E-01	9.40E-01
Uranium-238	7440-61-1	9.40E-01	6.30E-01	9.40E-01	9.40E-01	7.90E-01	9.40E-01	9.40E-01	9.40E-01
Yttrium-90	10098-91-6	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Zirconium-93	15751-77-6	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	Dose Factors								
		Plants			Soil Invertebrates			Mule Deer		
		External Soil[i]	External Air[j]	Internal[k]	External Soil[i]	External Air[j]	Internal[k]	External Soil[i]	External Air[j]	Internal[k]
Plutonium-242	13982-10-0	3.97E-06	1.28E-12	1.25E-03	3.97E-06	1.28E-12	1.25E-03	1.87E-10	1.28E-12	1.25E-03
Protactinium-231	14331-85-2	4.01E-06	5.50E-10	1.27E-03	4.01E-06	5.50E-10	1.27E-03	8.24E-08	5.50E-10	1.27E-03
Radium-226	13982-63-3	2.78E-05	1.01E-10	1.22E-03	2.78E-05	1.01E-10	1.22E-03	1.49E-08	1.01E-10	1.22E-03
Radium-228	15262-20-1	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07
Ruthenium-106	13967-48-1	0.00E+00	0.00E+00	5.11E-07	0.00E+00	0.00E+00	5.11E-07	0.00E+00	0.00E+00	5.11E-07
Samarium-151	15715-94-3	1.87E-12	1.16E-14	1.02E-06	1.87E-12	1.16E-14	1.02E-06	1.87E-12	1.16E-14	1.02E-06
Selenium-79	15758-45-9	2.07E-11	9.70E-14	2.86E-06	2.07E-11	9.70E-14	2.86E-06	2.07E-11	9.70E-14	2.86E-06
Strontium-90	10098-97-2	4.70E-10	2.41E-12	1.00E-05	4.70E-10	2.41E-12	1.00E-05	4.70E-10	2.41E-12	1.00E-05
Technetium-99	14133-79-7	1.05E-10	5.18E-13	5.16E-06	1.05E-10	5.18E-13	5.16E-06	1.05E-10	5.18E-13	5.16E-06
Thorium-229	15594-54-4	5.32E-06	1.23E-09	1.25E-03	5.32E-06	1.23E-09	1.25E-03	1.82E-07	1.23E-09	1.25E-03
Thorium-232	7440-29-1	3.97E-06	2.79E-12	1.02E-03	3.97E-06	2.79E-12	1.02E-03	4.16E-10	2.79E-12	1.02E-03
Tin-126	15832-50-5	4.41E-06	6.75E-10	8.82E-06	4.41E-06	6.75E-10	8.82E-06	1.02E-07	6.75E-10	9.34E-06
Tritium	10028-17-8	0.00E+00	1.06E-13	3.07E-07	0.00E+00	1.06E-13	3.07E-07	0.00E+00	1.06E-13	3.07E-07
Uranium-232	14158-29-3	7.94E-06	4.54E-12	1.36E-03	7.94E-06	4.54E-12	1.36E-03	6.74E-10	4.54E-12	1.36E-03
Uranium-233	13968-55-3	3.97E-06	5.22E-12	1.23E-03	3.97E-06	5.22E-12	1.23E-03	7.74E-10	5.22E-12	1.23E-03
Uranium-234	13966-29-5	7.94E-06	2.44E-12	1.22E-03	7.94E-06	2.44E-12	1.22E-03	3.62E-10	2.44E-12	1.22E-03
Uranium-235	15117-96-1	8.20E-06	2.30E-09	1.13E-03	8.20E-06	2.30E-09	1.13E-03	3.40E-07	2.30E-09	1.13E-03
Uranium-236	13982-70-2	7.94E-06	1.60E-12	1.15E-03	7.94E-06	1.60E-12	1.15E-03	2.34E-10	1.60E-12	1.15E-03
Uranium-238	7440-61-1	3.97E-06	1.09E-12	1.07E-03	3.97E-06	1.09E-12	1.07E-03	1.58E-10	1.09E-12	1.07E-03
Yttrium-90	10098-91-6	1.11E-08	6.08E-11	4.78E-05	1.11E-08	6.08E-11	4.78E-05	1.11E-08	6.08E-11	4.78E-05
Zirconium-93	15751-77-6	0.00E+00	0.00E+00	1.02E-06	0.00E+00	0.00E+00	1.02E-06	0.00E+00	0.00E+00	1.02E-06

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	Dose Factors								
		Mourning Dove			Great Basin Pocket Mouse			Meadowlark		
		External Soil[i]	External Air[j]	Internal[k]	External Soil[i]	External Air[j]	Internal[k]	External Soil[i]	External Air[j]	Internal[k]
Plutonium-242	13982-10-0	3.75E-10	1.28E-12	1.25E-03	6.97E-06	1.28E-12	1.25E-03	3.75E-10	1.28E-12	1.25E-03
Protactinium-231	14331-85-2	1.65E-07	5.50E-10	1.27E-03	7.88E-06	5.50E-10	1.27E-03	1.65E-07	5.50E-10	1.27E-03
Radium-226	13982-63-3	2.97E-08	1.01E-10	1.22E-03	4.88E-05	1.01E-10	1.22E-03	2.97E-08	1.01E-10	1.22E-03
Radium-228	15262-20-1	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07
Ruthenium-106	13967-48-1	0.00E+00	0.00E+00	5.11E-07	0.00E+00	0.00E+00	5.11E-07	0.00E+00	0.00E+00	5.11E-07
Samarium-151	15715-94-3	3.74E-12	1.16E-14	1.02E-06	1.12E-12	1.16E-14	1.02E-06	3.74E-12	1.16E-14	1.02E-06
Selenium-79	15758-45-9	4.14E-11	9.70E-14	2.86E-06	1.24E-11	9.70E-14	2.86E-06	4.14E-11	9.70E-14	2.86E-06
Strontium-90	10098-97-2	9.39E-10	2.41E-12	1.00E-05	2.82E-10	2.41E-12	1.00E-05	9.39E-10	2.41E-12	1.00E-05
Technetium-99	14133-79-7	2.09E-10	5.18E-13	5.16E-06	6.28E-11	5.18E-13	5.16E-06	2.09E-10	5.18E-13	5.16E-06
Thorium-229	15594-54-4	3.65E-07	1.23E-09	1.25E-03	1.15E-05	1.23E-09	1.25E-03	3.65E-07	1.23E-09	1.25E-03
Thorium-232	7440-29-1	8.31E-10	2.79E-12	1.02E-03	6.97E-06	2.79E-12	1.02E-03	8.31E-10	2.79E-12	1.02E-03
Tin-126	15832-50-5	2.04E-07	6.75E-10	8.84E-06	8.36E-06	6.75E-10	8.84E-06	2.04E-07	6.75E-10	8.84E-06
Tritium	10028-17-8	0.00E+00	1.06E-13	3.07E-07	0.00E+00	1.06E-13	3.07E-07	0.00E+00	1.06E-13	3.07E-07
Uranium-232	14158-29-3	1.35E-09	4.54E-12	1.36E-03	1.39E-05	4.54E-12	1.36E-03	1.35E-09	4.54E-12	1.36E-03
Uranium-233	13968-55-3	1.55E-09	5.22E-12	1.23E-03	6.97E-06	5.22E-12	1.23E-03	1.55E-09	5.22E-12	1.23E-03
Uranium-234	13966-29-5	7.24E-10	2.44E-12	1.22E-03	1.39E-05	2.44E-12	1.22E-03	7.24E-10	2.44E-12	1.22E-03
Uranium-235	15117-96-1	6.80E-07	2.30E-09	1.13E-03	1.60E-05	2.30E-09	1.13E-03	6.80E-07	2.30E-09	1.13E-03
Uranium-236	13982-70-2	4.68E-10	1.60E-12	1.15E-03	1.39E-05	1.60E-12	1.15E-03	4.68E-10	1.60E-12	1.15E-03
Uranium-238	7440-61-1	3.17E-10	1.09E-12	1.07E-03	6.97E-06	1.09E-12	1.07E-03	3.17E-10	1.09E-12	1.07E-03
Yttrium-90	10098-91-6	2.22E-08	6.08E-11	4.78E-05	6.67E-09	6.08E-11	4.78E-05	2.22E-08	6.08E-11	4.78E-05
Zirconium-93	15751-77-6	0.00E+00	0.00E+00	1.02E-06	0.00E+00	0.00E+00	1.02E-06	0.00E+00	0.00E+00	1.02E-06

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	Dose Factors								
		Coyote			Burrowing Owl			Red-tailed Hawk		
		External Soil[i]	External Air[j]	Internal[k]	External Soil[i]	External Air[j]	Internal[k]	External Soil[i]	External Air[j]	Internal[k]
Plutonium-242	13982-10-0	3.55E-06	1.28E-12	1.25E-03	5.92E-06	1.28E-12	1.25E-03	1.87E-11	1.28E-12	1.25E-03
Protactinium-231	14331-85-2	3.28E-05	5.50E-10	1.27E-03	1.82E-05	5.50E-10	1.27E-03	8.24E-09	5.50E-10	1.27E-03
Radium-226	13982-63-3	2.49E-05	1.01E-10	1.22E-03	4.10E-05	1.01E-10	1.22E-03	1.49E-09	1.01E-10	1.22E-03
Radium-228	15262-20-1	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07
Ruthenium-106	13967-48-1	0.00E+00	0.00E+00	5.11E-07	0.00E+00	0.00E+00	5.11E-07	0.00E+00	0.00E+00	5.11E-07
Samarium-151	15715-94-3	2.62E-12	1.16E-14	1.02E-06	1.87E-12	1.16E-14	1.02E-06	1.87E-13	1.16E-14	1.02E-06
Selenium-79	15758-45-9	2.90E-11	9.70E-14	2.86E-06	2.07E-11	9.70E-14	2.86E-06	2.07E-12	9.70E-14	2.86E-06
Strontium-90	10098-97-2	6.57E-10	2.41E-12	1.00E-05	4.70E-10	2.41E-12	1.00E-05	4.70E-11	2.41E-12	1.00E-05
Technetium-99	14133-79-7	1.47E-10	5.18E-13	5.16E-06	1.05E-10	5.18E-13	5.16E-06	1.05E-11	5.18E-13	5.16E-06
Thorium-229	15594-54-4	2.93E-05	1.23E-09	1.25E-03	2.68E-05	1.23E-09	1.25E-03	1.82E-08	1.23E-09	1.25E-03
Thorium-232	7440-29-1	3.55E-06	2.79E-12	1.02E-03	5.92E-06	2.79E-12	1.02E-03	4.16E-11	2.79E-12	1.02E-03
Tin-126	15832-50-5	2.75E-05	6.75E-10	9.16E-06	1.99E-05	6.75E-10	8.95E-06	1.02E-08	6.75E-10	8.95E-06
Tritium	10028-17-8	0.00E+00	1.06E-13	3.07E-07	0.00E+00	1.06E-13	3.07E-07	0.00E+00	1.06E-13	3.07E-07
Uranium-232	14158-29-3	7.11E-06	4.54E-12	1.36E-03	1.18E-05	4.54E-12	1.36E-03	6.74E-11	4.54E-12	1.36E-03
Uranium-233	13968-55-3	3.55E-06	5.22E-12	1.23E-03	5.92E-06	5.22E-12	1.23E-03	7.74E-11	5.22E-12	1.23E-03
Uranium-234	13966-29-5	7.11E-06	2.44E-12	1.22E-03	1.18E-05	2.44E-12	1.22E-03	3.62E-11	2.44E-12	1.22E-03
Uranium-235	15117-96-1	5.64E-05	2.30E-09	1.13E-03	3.97E-05	2.30E-09	1.13E-03	3.40E-08	2.30E-09	1.13E-03
Uranium-236	13982-70-2	7.11E-06	1.60E-12	1.15E-03	1.18E-05	1.60E-12	1.15E-03	2.34E-11	1.60E-12	1.15E-03
Uranium-238	7440-61-1	3.55E-06	1.09E-12	1.07E-03	5.92E-06	1.09E-12	1.07E-03	1.58E-11	1.09E-12	1.07E-03
Yttrium-90	10098-91-6	1.56E-08	6.08E-11	4.78E-05	1.11E-08	6.08E-11	4.78E-05	1.11E-09	6.08E-11	4.78E-05
Zirconium-93	15751-77-6	0.00E+00	0.00E+00	1.02E-06	0.00E+00	0.00E+00	1.02E-06	0.00E+00	0.00E+00	1.02E-06

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	Dose Factors								
		Benthic Invertebrates			Aquatic Biota, Including Salmonids			Canada Goose		
		External Water[j]	External Sediment[m]	Internal[k]	External Water[l]	External Sediment[m]	Internal[k]	External Water[l]	External Air[j]	Internal[k]
Plutonium-242	13982-10-0	1.89E-12	1.70E-08	1.25E-03	2.76E-12	1.54E-10	1.25E-03	1.54E-12	1.28E-12	1.25E-03
Protactinium-231	14331-85-2	2.43E-10	2.18E-06	1.27E-03	1.81E-09	1.01E-07	1.27E-03	1.12E-09	5.50E-10	1.27E-03
Radium-226	13982-63-3	1.33E-11	1.19E-07	1.22E-03	1.94E-11	1.08E-09	1.22E-03	1.25E-11	1.01E-10	1.22E-03
Radium-228	15262-20-1	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07
Ruthenium-106	13967-48-1	0.00E+00	0.00E+00	5.11E-07	0.00E+00	0.00E+00	5.11E-07	0.00E+00	0.00E+00	5.11E-07
Samarium-151	15715-94-3	0.00E+00	0.00E+00	1.02E-06	0.00E+00	0.00E+00	1.02E-06	0.00E+00	1.16E-14	1.02E-06
Selenium-79	15758-45-9	0.00E+00	0.00E+00	2.86E-06	0.00E+00	0.00E+00	2.86E-06	0.00E+00	9.70E-14	2.86E-06
Strontium-90	10098-97-2	0.00E+00	0.00E+00	1.00E-05	0.00E+00	0.00E+00	1.00E-05	0.00E+00	2.41E-12	1.00E-05
Technetium-99	14133-79-7	0.00E+00	0.00E+00	5.16E-06	0.00E+00	0.00E+00	5.16E-06	0.00E+00	5.18E-13	5.16E-06
Thorium-229	15594-54-4	4.87E-10	4.39E-06	1.25E-03	4.07E-09	2.26E-07	1.25E-03	2.30E-09	1.23E-09	1.25E-03
Thorium-232	7440-29-1	1.89E-12	1.70E-08	1.02E-03	2.76E-12	1.54E-10	1.02E-03	1.54E-12	2.79E-12	1.02E-03
Tin-126	15832-50-5	2.88E-10	2.60E-06	8.82E-06	2.29E-09	1.27E-07	9.16E-06	1.34E-09	6.75E-10	9.04E-06
Tritium	10028-17-8	0.00E+00	0.00E+00	3.07E-07	0.00E+00	0.00E+00	3.07E-07	0.00E+00	1.06E-13	3.07E-07
Uranium-232	14158-29-3	3.79E-12	3.41E-08	1.36E-03	5.53E-12	3.07E-10	1.36E-03	3.07E-12	4.54E-12	1.36E-03
Uranium-233	13968-55-3	1.89E-12	1.70E-08	1.23E-03	2.76E-12	1.54E-10	1.23E-03	1.54E-12	5.22E-12	1.23E-03
Uranium-234	13966-29-5	3.79E-12	3.41E-08	1.22E-03	5.53E-12	3.07E-10	1.22E-03	3.07E-12	2.44E-12	1.22E-03
Uranium-235	15117-96-1	7.92E-10	7.13E-06	1.13E-03	6.51E-09	3.61E-07	1.13E-03	3.75E-09	2.30E-09	1.13E-03
Uranium-236	13982-70-2	3.79E-12	3.41E-08	1.15E-03	5.53E-12	3.07E-10	1.15E-03	3.07E-12	1.60E-12	1.15E-03
Uranium-238	7440-61-1	1.89E-12	1.70E-08	1.07E-03	2.76E-12	1.54E-10	1.07E-03	1.54E-12	1.09E-12	1.07E-03
Yttrium-90	10098-91-6	0.00E+00	0.00E+00	4.78E-05	0.00E+00	0.00E+00	4.78E-05	0.00E+00	6.08E-11	4.78E-05
Zirconium-93	15751-77-6	0.00E+00	0.00E+00	1.02E-06	0.00E+00	0.00E+00	1.02E-06	0.00E+00	0.00E+00	1.02E-06

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	Dose Factors										
		Spotted Sandpiper				Great Blue Heron				Bald Eagle		
		External Water[l]	External Sediment[m]	External Air[j]	Internal[k]	External Water[l]	External Sediment[m]	External Air[j]	Internal[k]	External Water[l]	External Air[j]	Internal[k]
Plutonium-242	13982-10-0	5.38E-12	3.23E-09	1.28E-12	1.25E-03	1.54E-12	6.14E-10	1.28E-12	1.25E-03	1.54E-13	1.28E-12	1.25E-03
Protactinium-231	14331-85-2	1.21E-09	7.24E-07	5.50E-10	1.27E-03	1.12E-09	4.47E-07	5.50E-10	1.27E-03	1.12E-10	5.50E-10	1.27E-03
Radium-226	13982-63-3	3.76E-11	2.26E-08	1.01E-10	1.22E-03	1.25E-11	5.02E-09	1.01E-10	1.22E-03	1.25E-12	1.01E-10	1.22E-03
Radium-228	15262-20-1	0.00E+00	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	0.00E+00	8.69E-07	0.00E+00	0.00E+00	8.69E-07
Ruthenium-106	13967-48-1	0.00E+00	0.00E+00	0.00E+00	5.11E-07	0.00E+00	0.00E+00	0.00E+00	5.11E-07	0.00E+00	0.00E+00	5.11E-07
Samarium-151	15715-94-3	0.00E+00	0.00E+00	1.16E-14	1.02E-06	0.00E+00	0.00E+00	1.16E-14	1.02E-06	0.00E+00	1.16E-14	1.02E-06
Selenium-79	15758-45-9	0.00E+00	0.00E+00	9.70E-14	2.86E-06	0.00E+00	0.00E+00	9.70E-14	2.86E-06	0.00E+00	9.70E-14	2.86E-06
Strontium-90	10098-97-2	0.00E+00	0.00E+00	2.41E-12	1.00E-05	0.00E+00	0.00E+00	2.41E-12	1.00E-05	0.00E+00	2.41E-12	1.00E-05
Technetium-99	14133-79-7	0.00E+00	0.00E+00	5.18E-13	5.16E-06	0.00E+00	0.00E+00	5.18E-13	5.16E-06	0.00E+00	5.18E-13	5.16E-06
Thorium-229	15594-54-4	2.42E-09	1.45E-06	1.23E-09	1.25E-03	2.30E-09	9.18E-07	1.23E-09	1.25E-03	2.30E-10	1.23E-09	1.25E-03
Thorium-232	7440-29-1	5.38E-12	3.23E-09	2.79E-12	1.02E-03	1.54E-12	6.14E-10	2.79E-12	1.02E-03	1.54E-13	2.79E-12	1.02E-03
Tin-126	15832-50-5	1.44E-09	8.61E-07	6.75E-10	8.84E-06	1.34E-09	5.34E-07	6.75E-10	9.04E-06	1.34E-10	6.75E-10	9.04E-06
Tritium	10028-17-8	0.00E+00	0.00E+00	1.06E-13	3.07E-07	0.00E+00	0.00E+00	1.06E-13	3.07E-07	0.00E+00	1.06E-13	3.07E-07
Uranium-232	14158-29-3	1.08E-11	6.45E-09	4.54E-12	1.36E-03	3.07E-12	1.23E-09	4.54E-12	1.36E-03	3.07E-13	4.54E-12	1.36E-03
Uranium-233	13968-55-3	5.38E-12	3.23E-09	5.22E-12	1.23E-03	1.54E-12	6.14E-10	5.22E-12	1.23E-03	1.54E-13	5.22E-12	1.23E-03
Uranium-234	13966-29-5	1.08E-11	6.45E-09	2.44E-12	1.22E-03	3.07E-12	1.23E-09	2.44E-12	1.22E-03	3.07E-13	2.44E-12	1.22E-03
Uranium-235	15117-96-1	3.95E-09	2.37E-06	2.30E-09	1.13E-03	3.75E-09	1.50E-06	2.30E-09	1.13E-03	3.75E-10	2.30E-09	1.13E-03
Uranium-236	13982-70-2	1.08E-11	6.45E-09	1.60E-12	1.15E-03	3.07E-12	1.23E-09	1.60E-12	1.15E-03	3.07E-13	1.60E-12	1.15E-03
Uranium-238	7440-61-1	5.38E-12	3.23E-09	1.09E-12	1.07E-03	1.54E-12	6.14E-10	1.09E-12	1.07E-03	1.54E-13	1.09E-12	1.07E-03
Yttrium-90	10098-91-6	0.00E+00	0.00E+00	6.08E-11	4.78E-05	0.00E+00	0.00E+00	6.08E-11	4.78E-05	0.00E+00	6.08E-11	4.78E-05
Zirconium-93	15751-77-6	0.00E+00	0.00E+00	0.00E+00	1.02E-06	0.00E+00	0.00E+00	0.00E+00	1.02E-06	0.00E+00	0.00E+00	1.02E-06

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for ROPCs

Radionuclide of Potential Concern	CAS Registry Number	Dose Factors		
		Mink		
		External Water[i]	External Air[j]	Internal[k]
Plutonium-242	13982-10-0	6.14E-13	1.28E-12	1.25E-03
Protactinium-231	14331-85-2	4.62E-10	5.50E-10	1.27E-03
Radium-226	13982-63-3	5.02E-12	1.01E-10	1.22E-03
Radium-228	15262-20-1	0.00E+00	0.00E+00	8.69E-07
Ruthenium-106	13967-48-1	0.00E+00	0.00E+00	5.11E-07
Samarium-151	15715-94-3	0.00E+00	1.16E-14	1.02E-06
Selenium-79	15758-45-9	0.00E+00	9.70E-14	2.86E-06
Strontium-90	10098-97-2	0.00E+00	2.41E-12	1.00E-05
Technetium-99	14133-79-7	0.00E+00	5.18E-13	5.16E-06
Thorium-229	15594-54-4	9.40E-10	1.23E-09	1.25E-03
Thorium-232	7440-29-1	6.14E-13	2.79E-12	1.02E-03
Tin-126	15832-50-5	5.52E-10	6.75E-10	8.95E-06
Tritium	10028-17-8	0.00E+00	1.06E-13	3.07E-07
Uranium-232	14158-29-3	1.23E-12	4.54E-12	1.36E-03
Uranium-233	13968-55-3	6.14E-13	5.22E-12	1.23E-03
Uranium-234	13966-29-5	1.23E-12	2.44E-12	1.22E-03
Uranium-235	15117-96-1	1.53E-09	2.30E-09	1.13E-03
Uranium-236	13982-70-2	1.23E-12	1.60E-12	1.15E-03
Uranium-238	7440-61-1	6.14E-13	1.09E-12	1.07E-03
Yttrium-90	10098-91-6	0.00E+00	6.08E-11	4.78E-05
Zirconium-93	15751-77-6	0.00E+00	0.00E+00	1.02E-06

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Daughter Radionuclides in Sediment

Notes/Sources

[a] Dose conversion factor (DCF) for external radiation.

[b] DCF for soil contaminated to a depth of 1 cm (Eckerman and Ryman 1993, Table III.4).

[c] DCF for immersion in air (Eckerman and Ryman 1993, Table III.1).

[d] Alpha energy of the radionuclide (MeV) × proportion of disintegrations producing an α-particle (Eckerman and Ryman 1993, Table A.1).

[e] Absorbed fraction of energy $E_\alpha n_\alpha$ (assumed to be 1.0 for alpha radiations).

[f] Beta energy of the radionuclide (MeV) × proportion of disintegrations producing a β-particle (Eckerman and Ryman 1993, Table A.1).

[g] Absorbed fraction of energy $E_\beta n_\beta$ or $E_\gamma n_\gamma$ (Blaylock, Frank, and O'Neal 1993; DOE 1997).

[h] Photon energy emitted during transition from a higher to a lower energy state (MeV) × proportion of disintegrations producing a γ-particle (Eckerman and Ryman 1993, Table A.1).

[i] Factor that, when multiplied by concentration of radionuclide in soil, gives the external dose from soil.

$DF_{soil} = F_{above} \times F_{ruf} \times DCF \times CFb \times ECF + 1.05 \times F_{below} \times E_\gamma n_\gamma \times \Phi_\gamma \times CFa$ (Sample and others 1997);

F_{above} = fraction of time spent above ground (unitless),

F_{ruf} = dose rate reduction factor accounting for ground roughness (unitless),

CFb = conversion factor to change Sv/s per Bq/m^3 to mrad g/pCi-d (5.12×10^{14}),

ECF = elevation correction factor to adjust dose coefficients to value representative of effective height of animal above ground,

1.05 = conversion factor to account for immersion in soil rather than water,

F_{below} = fraction of time spent below ground surface, and

CFa = conversion factor to go from MeV/nt to g-rad/pCi-d (5.12×10^{-5}).

[j] Factor that, when multiplied by concentration of radionuclide in air, gives the external dose from air.

$DF_{air} = 3.20 \times 10^5 \times DCF$ (Eckerman and Ryman 1993).

[k] Factor that, when multiplied by concentration of radionuclide in tissue, gives the internal dose from food and soil ingestion (Equation 8-28).

$DF_{int} = (QF \times E_\alpha n_\alpha \times \Phi_\alpha + E_\beta n_\beta \times \Phi_\beta + E_\gamma n_\gamma \times \Phi_\gamma) \times CFa$ (Sample and others 1997);

QF = quality factor to account for greater biological effectiveness of alpha particles (5 for alpha particles).

[l] Factor that, when multiplied by concentration of radionuclide in water, gives the external dose from immersion in water (Equation 8-55).

$DF_{water,\ imm} = (1-F_s-F_{in}) \times 0.001 \times CFa \times [(1-\Phi_\beta) \times E_\beta n_\beta + (1-\Phi_\gamma) \times E_\gamma n_\gamma]$ (Blaylock, Frank, and O'Neal 1993);

F_s = fraction of time receptor spends at the sediment-water interface (unitless),

Table C2-6 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Daughter Radionuclides in Sediment

Notes/Sources

F_{in} = fraction of time receptor spends buried in sediment (unitless), and

0.001 = factor to convert liters to grams (L/g).

[m] Factor that, when multiplied by concentration of radionuclide in sediment, gives the external dose from sediment (Equation 8-56).

$DF_{sediment} = (0.5 \times F_s + F_{in}) \times CFa \times [(1-\Phi_\beta) \times E_\beta n_\beta + (1-\Phi_\gamma) \times E_\gamma n_\gamma]$ (Blaylock, Frank, and O'Neal 1993).

[n] Chemical Abstracts Service Registry number for niobium metal.

Table C2-7 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for Non-ROPC Daughter Radionuclides in Sediment

Parent ROPC	Daughter Radionuclides[b]	CAS Registry Number	Half-life (years)	Decay Energies and Absorption Factors				
				$E_\alpha n_\alpha$[c]	Φ_α[d]	$E_\beta n_\beta$[e]	Φ_β[f]	$E_\gamma n_\gamma$[g]
Actinium-227	Thorium-227 (98.62 %)	15623-47-9	5.12E-02	5.88E+00	1.00E+00	5.30E-02	1.00E+00	1.10E-01
	Francium-223 (1.38 %)	15756-98-6	4.14E-05	0.00E+00	1.00E+00	4.00E-01	1.00E+00	5.90E-02
	Radium-223	15623-45-7	3.13E-02	5.67E+00	1.00E+00	7.60E-02	1.00E+00	1.34E-01
	Radon-219	14835-02-0	1.25E-07	6.76E+00	1.00E+00	6.00E-03	1.00E+00	5.60E-02
	Polonium-215	15706-52-2	5.64E-11	7.39E+00	1.00E+00	0.00E+00	1.00E+00	0.00E+00
	Lead-211	15816-77-0	6.86E-05	0.00E+00	1.00E+00	4.56E-01	1.00E+00	5.10E-02
	Bismuth-211	15229-37-5	4.07E-06	6.55E+00	1.00E+00	1.00E-02	1.00E+00	4.70E-02
	Thallium-207 (99.72%)	14133-67-6	9.07E-06	0.00E+00	1.00E+00	4.93E-01	1.00E+00	2.00E-03
	Polonium-211 (0.27 %)	No CAS#	1.64E-08	7.44E+00	1.00E+00	0.00E+00	1.00E+00	8.00E-03
	Sum	NA	NA	NA	NA	NA	NA	NA
Americium-243	Neptunium-239	13968-59-7	6.45E-03	0.00E+00	1.00E+00	2.60E-01	1.00E+00	1.73E-01
Antimony-125	Tellurium-125m	14390-73-9	1.59E-01	0.00E+00	1.00E+00	1.09E-01	1.00E+00	3.60E-02
Cesium-137	Barium-137m	7440-39-3	4.85E-06	0.00E+00	1.00E+00	6.50E-02	1.00E+00	5.97E-01
Europium-152	Gadolinium-152	No CAS #	1.08E+14	2.15E+00	1.00E+00	0.00E+00	1.00E+00	0.00E+00
Neptunium-237	Protactinium-233	13981-14-1	7.39E-02	0.00E+00	1.00E+00	1.96E-01	1.00E+00	2.04E-01
Radium-226	Radon-222	14859-67-7	1.05E-02	5.49E+00	1.00E+00	0.00E+00	1.00E+00	0.00E+00
	Polonium-218	15422-74-9	5.80E-06	6.00E+00	1.00E+00	0.00E+00	1.00E+00	0.00E+00
	Lead-214	15067-28-4	5.10E-05	0.00E+00	1.00E+00	2.93E-01	1.00E+00	2.50E-01
	Bismuth-214	14733-03-0	3.78E-05	0.00E+00	1.00E+00	6.59E-01	1.00E+00	1.51E+00
	Polonium-214	15735-68-8	5.21E-12	7.69E+00	1.00E+00	0.00E+00	1.00E+00	0.00E+00
	Sum	NA	NA	NA	NA	NA	NA	NA

Table C2-7 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for Non-ROPC Daughter Radionuclides in Sediment

Parent ROPC	Daughter Radionuclides[b]	Internal Gamma Absorption Factors Φ_y[f]							
		Plants	Benthic Inverte-brates	Aquatic Biota, Including Salmonids	Canada Goose	Spotted Sandpiper	Great Blue Heron	Bald Eagle	Mink
Actinium-227	Thorium-227 (98.62 %)	8.10E-03	8.10E-03	1.09E-01	6.20E-02	1.25E-02	6.20E-02	6.20E-02	4.20E-02
	Francium-223 (1.38 %)	1.05E-02	1.05E-02	1.32E-01	8.00E-02	1.50E-02	8.00E-02	8.00E-02	5.30E-02
	Radium-223	8.00E-03	8.00E-03	1.03E-01	6.00E-02	1.17E-02	6.00E-02	6.00E-02	4.00E-02
	Radon-219	1.08E-02	1.08E-02	1.34E-01	8.20E-02	1.58E-02	8.20E-02	8.20E-02	5.40E-02
	Polonium-215	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
	Lead-211	1.15E-02	1.15E-02	1.41E-01	8.70E-02	1.64E-02	8.70E-02	8.70E-02	5.70E-02
	Bismuth-211	1.25E-02	1.25E-02	1.46E-01	9.20E-02	1.75E-02	9.20E-02	9.20E-02	6.00E-02
	Thallium-207 (99.72%)	6.30E-01	6.30E-01	9.30E-01	9.30E-01	7.90E-01	9.30E-01	9.30E-01	9.30E-01
	Polonium-211 (0.27 %)	6.30E-01	6.30E-01	9.30E-01	9.30E-02	7.90E-01	9.30E-02	9.30E-02	9.30E-01
	Sum	NA	NA	NA	NA	NA	NA	NA	NA
Americium-243	Neptunium-239	8.40E-03	8.40E-03	9.20E-02	6.00E-02	1.13E-02	6.00E-02	6.00E-02	4.00E-02
Antimony-125	Tellurium-125m	2.70E-02	2.70E-02	2.05E-01	1.50E-01	4.00E-02	1.50E-01	1.50E-01	1.10E-01
Cesium-137	Barium-137m	1.10E-02	1.10E-02	1.03E-01	6.00E-02	1.46E-02	6.00E-02	6.00E-02	4.00E-02
Europium-152	Gadolinium-152	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Neptunium-237	Protactinium-233	9.00E-03	9.00E-03	9.20E-02	6.00E-02	1.00E-02	6.00E-02	6.00E-02	4.00E-02
Radium-226	Radon-222	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
	Polonium-218	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
	Lead-214	9.40E-03	9.40E-03	1.00E-01	6.00E-02	1.05E-02	6.00E-02	6.00E-02	4.00E-02
	Bismuth-214	8.80E-03	8.80E-03	8.90E-02	5.20E-02	1.25E-02	5.20E-02	5.20E-02	3.30E-02
	Polonium-214	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
	Sum	NA	NA	NA	NA	NA	NA	NA	NA

Table C2-7 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for Non-ROPC Daughter Radionuclides in Sediment

Parent ROPC	Daughter Radionuclides[b]	Dose Factors										
		Benthic Invertebrates		Aquatic Biota, Including Salmonids		Canada Goose	Spotted Sandpiper		Great Blue Heron		Bald Eagle	Mink
		External Sediment[h]	Internal[i]	External Sediment[h]	Internal[i]	Internal[i]	External Sediment[h]	Internal[i]	External Sediment[h]	Internal[i]	Internal[i]	Internal[i]
Actinium-227	Thorium-227 (98.62 %)	5.03E-06	1.51E-03	2.51E-07	1.51E-03	1.51E-03	1.67E-06	1.51E-03	1.06E-06	1.51E-03	1.51E-03	1.51E-03
	Francium-223 (1.38 %)	2.69E-06	2.05E-05	1.31E-07	2.08E-05	2.07E-05	8.93E-07	2.05E-05	5.56E-07	2.07E-05	2.07E-05	2.06E-05
	Radium-223	6.13E-06	1.45E-03	3.08E-07	1.45E-03	1.45E-03	2.03E-06	1.45E-03	1.29E-06	1.45E-03	1.45E-03	1.45E-03
	Radon-219	2.55E-06	1.73E-03	1.24E-07	1.73E-03	1.73E-03	8.47E-07	1.73E-03	5.26E-07	1.73E-03	1.73E-03	1.73E-03
	Polonium-215	0.00E+00	1.89E-03	0.00E+00	1.89E-03	1.89E-03	0.00E+00	1.89E-03	0.00E+00	1.89E-03	1.89E-03	1.89E-03
	Lead-211	2.32E-06	2.33E-05	1.12E-07	2.37E-05	2.35E-05	7.71E-07	2.33E-05	4.77E-07	2.35E-05	2.35E-05	2.35E-05
	Bismuth-211	2.14E-06	1.67E-03	1.03E-07	1.67E-03	1.67E-03	7.09E-07	1.67E-03	4.37E-07	1.67E-03	1.67E-03	1.67E-03
	Thallium-207 (99.72%)	3.41E-08	2.53E-05	3.58E-10	2.53E-05	2.53E-05	6.45E-09	2.53E-05	1.43E-09	2.53E-05	2.53E-05	2.53E-05
	Polonium-211 (0.27 %)	1.36E-07	1.90E-03	1.43E-09	1.90E-03	1.90E-03	2.58E-08	1.90E-03	7.43E-08	1.90E-03	1.90E-03	1.90E-03
	Sum	1.82E-05	8.28E-03	8.97E-07	8.28E-03	8.28E-03	6.02E-06	8.28E-03	3.78E-06	8.28E-03	8.28E-03	8.28E-03
Americium-243	Neptunium-239	7.90E-06	1.34E-05	4.02E-07	1.41E-05	1.38E-05	2.63E-06	1.34E-05	1.67E-06	1.38E-05	1.38E-05	1.36E-05
Antimony-125	Tellurium-125m	1.61E-06	5.62E-06	7.33E-08	5.95E-06	5.85E-06	5.31E-07	5.64E-06	3.13E-07	5.85E-06	5.85E-06	5.77E-06
Cesium-137	Barium-137m	2.72E-05	3.66E-06	1.37E-06	6.46E-06	5.15E-06	9.04E-06	3.77E-06	5.75E-06	5.15E-06	5.15E-06	4.54E-06
Europium-152	Gadolinium-152	0.00E+00	5.49E-04	0.00E+00	5.49E-04	5.49E-04	0.00E+00	5.49E-04	0.00E+00	5.49E-04	5.49E-04	5.49E-04
Neptunium-237	Protactinium-233	9.32E-06	1.01E-05	4.74E-07	1.10E-05	1.06E-05	3.10E-06	1.01E-05	1.96E-06	1.06E-05	1.06E-05	1.04E-05
Radium-226	Radon-222	0.00E+00	1.40E-03	0.00E+00	1.40E-03	1.40E-03	0.00E+00	1.40E-03	0.00E+00	1.40E-03	1.40E-03	1.40E-03
	Polonium-218	0.00E+00	1.53E-03	0.00E+00	1.53E-03	1.53E-03	0.00E+00	1.53E-03	0.00E+00	1.53E-03	1.53E-03	1.53E-03
	Lead-214	1.14E-05	1.51E-05	5.76E-07	1.62E-05	1.57E-05	3.80E-06	1.51E-05	2.41E-06	1.57E-05	1.57E-05	1.55E-05
	Bismuth-214	6.89E-05	3.44E-05	3.52E-06	4.05E-05	3.77E-05	2.29E-05	3.46E-05	1.46E-05	3.77E-05	3.77E-05	3.62E-05
	Polonium-214	0.00E+00	1.96E-03	0.00E+00	1.96E-03	1.96E-03	0.00E+00	1.96E-03	0.00E+00	1.96E-03	1.96E-03	1.96E-03
	Sum	8.03E-05	4.95E-03	4.09E-06	4.96E-03	4.95E-03	2.67E-05	4.95E-03	1.70E-05	4.95E-03	4.95E-03	4.95E-03

Table C2-7 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for Non-ROPC Daughter Radionuclides in Sediment

Parent ROPC	Daughter Radionuclides[b]	CAS Registry Number	Half-life (years)	Decay Energies and Absorption Factors				
				$E_\alpha n_\alpha$[c]	Φ_α[d]	$E_\beta n_\beta$[e]	Φ_β[f]	$E_\gamma n_\gamma$[g]
Radium-228	Actinium-228	14331-83-0	6.99E-04	0.00E+00	1.00E+00	4.75E-01	1.00E+00	9.71E-01
Ruthenium-106	Rhodium-106	14234-34-5	9.47E-07	0.00E+00	1.00E+00	1.41E+00	1.00E+00	2.05E-01
Strontium-90	Yttrium-90	10098-91-6	7.30E-03	0.00E+00	1.00E+00	9.35E-01	1.00E+00	0.00E+00
	Niobium-90	No CAS #	1.67E-03	0.00E+00	1.00E+00	4.03E-01	1.00E+00	4.22E+00
Thorium-229	Radium-225	13981-53-8	4.05E-02	0.00E+00	1.00E+00	1.07E-01	1.00E+00	1.40E-02
	Actinium-225	14265-85-1	2.74E-02	5.79E+00	1.00E+00	2.20E-02	1.00E+00	1.80E-02
	Francium-221	15756-41-9	9.13E-06	6.30E+00	1.00E+00	1.00E-02	1.00E+00	3.10E-02
	Astatine-217	17239-90-6	1.02E-09	7.07E+00	1.00E+00	0.00E+00	1.00E+00	0.00E+00
	Bismuth-213	15776-20-2	8.68E-05	1.26E-01	1.00E+00	4.42E-01	1.00E+00	1.33E-01
	Polonium-213 (97.84 %)	15756-57-7	1.33E-13	8.38E+00	1.00E+00	0.00E+00	1.00E+00	0.00E+00
	Thallium-209 (2.16 %)	15690-73-0	4.18E-06	0.00E+00	1.00E+00	6.88E-01	1.00E+00	2.03E+00
	Lead-209	14119-30-3	3.71E-04	0.00E+00	1.00E+00	1.98E-01	1.00E+00	0.00E+00
	Sum	NA	NA	NA	NA	NA	NA	NA
Tin-126	Antimony-126	15756-32-8	3.39E-02	0.00E+00	1.00E+00	2.83E-01	1.00E+00	2.83E+00
Uranium-235	Thorium-231	14932-40-2	2.91E-03	0.00E+00	1.00E+00	1.65E-01	1.00E+00	2.60E-02
Uranium-238	Thorium-234	15605-10-8	6.60E-02	0.00E+00	1.00E+00	6.00E-02	1.00E+00	9.00E-03
	Protactinium-234m	1510-28-4m	2.22E-06	0.00E+00	1.00E+00	8.22E-01	1.00E+00	1.20E-02
	Protactinium-234	15100-28-4	7.64E-04	0.00E+00	1.00E+00	4.94E-01	1.00E+00	1.92E+00
Yttrium-90	Niobium-90	No CAS #	1.67E-03	0.00E+00	1.00E+00	4.03E-01	1.00E+00	4.22E+00
Zirconium-93	Niobium-93m	7440-03-1	1.36E+01	0.00E+00	1.00E+00	2.80E-02	1.00E+00	2.00E-03

Table C2-7 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for Non-ROPC Daughter Radionuclides in Sediment

Parent ROPC	Daughter Radionuclides[b]	Internal							
		Gamma Absorption Factors Φ_γ^f							
		Plants	Benthic Inverte-brates	Aquatic Biota, Including Salmonids	Canada Goose	Spotted Sandpiper	Great Blue Heron	Bald Eagle	Mink
Radium-228	Actinium-228	1.00E-02	1.00E-02	9.20E-02	6.00E-02	1.30E-02	6.00E-02	6.00E-02	4.00E-02
Ruthenium-106	Rhodium-106	9.00E-03	9.00E-03	9.20E-02	6.00E-02	1.00E-02	6.00E-02	6.00E-02	4.00E-02
Strontium-90	Yttrium-90	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
	Niobium-90	7.60E-03	7.60E-03	7.25E-02	4.00E-02	9.00E-03	4.00E-02	4.00E-02	3.00E-02
Thorium-229	Radium-225	3.90E-01	3.90E-01	7.50E-01	7.00E-01	4.48E-01	7.00E-01	7.00E-01	7.00E-01
	Actinium-225	2.37E-01	2.37E-01	5.20E-01	4.45E-01	3.00E-01	4.45E-01	4.45E-01	4.00E-01
	Francium-221	4.00E-02	4.00E-02	2.26E-01	1.65E-01	5.00E-02	1.65E-01	1.65E-01	1.30E-01
	Astatine-217	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
	Bismuth-213	8.00E-03	8.00E-03	9.50E-02	6.00E-02	1.10E-02	6.00E-02	6.00E-02	4.00E-02
	Polonium-213 (97.84 %)	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
	Thallium-209 (2.16 %)	8.40E-03	8.40E-03	8.30E-02	4.80E-02	1.10E-02	4.80E-02	4.80E-02	3.00E-02
	Lead-209	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
	Sum	NA	NA	NA	NA	NA	NA	NA	NA
Tin-126	Antimony-126	8.30E-03	8.30E-03	6.60E-02	4.00E-02	1.05E-02	4.00E-02	4.00E-02	3.00E-02
Uranium-235	Thorium-231	9.00E-02	9.00E-02	3.34E-01	2.10E-01	1.26E-01	2.10E-01	2.10E-01	1.60E-01
Uranium-238	Thorium-234	6.30E-01	6.30E-01	9.30E-01	9.30E-01	7.90E-01	9.30E-01	9.30E-01	9.30E-01
	Protactinium-234m	5.50E-01	5.50E-01	9.30E-01	9.30E-01	6.30E-01	9.30E-01	9.30E-01	9.30E-01
	Protactinium-234	8.40E-03	8.40E-03	8.00E-02	4.00E-02	1.15E-02	4.00E-02	4.00E-02	3.00E-02
Yttrium-90	Niobium-90	7.60E-03	7.60E-03	7.25E-02	4.00E-02	9.00E-03	4.00E-02	4.00E-02	3.00E-02
Zirconium-93	Niobium-93m	6.30E-01	6.30E-01	9.30E-01	9.30E-01	7.90E-01	9.30E-01	9.30E-01	9.30E-01

Table C2-7 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for Non-ROPC Daughter Radionuclides in Sediment

		Dose Factors										
		Benthic Invertebrates		Aquatic Biota, Including Salmonids		Canada Goose	Spotted Sandpiper		Great Blue Heron		Bald Eagle	Mink
Parent ROPC	Daughter Radionuclides[b]	External Sediment[h]	Internal[i]	External Sediment[h]	Internal[i]	Internal[i]	External Sediment[h]	Internal[i]	External Sediment[h]	Internal[i]	Internal[i]	Internal[i]
Radium-228	Actinium-228	4.43E-05	2.48E-05	2.26E-06	2.88E-05	2.72E-05	1.47E-05	2.49E-05	9.35E-06	2.72E-05	2.72E-05	2.63E-05
Ruthenium-106	Rhodium-106	9.36E-06	7.23E-05	4.77E-07	7.32E-05	7.28E-05	3.12E-06	7.23E-05	1.97E-06	7.28E-05	7.28E-05	7.26E-05
Strontium-90	Yttrium-90	0.00E+00	4.78E-05	0.00E+00	4.78E-05	4.78E-05	0.00E+00	4.78E-05	0.00E+00	4.78E-05	4.78E-05	4.78E-05
	Niobium-90	1.93E-04	2.22E-05	1.00E-05	3.62E-05	2.92E-05	6.43E-05	2.25E-05	4.15E-05	2.92E-05	2.92E-05	2.71E-05
Thorium-229	Radium-225	3.94E-07	5.75E-06	8.96E-09	6.00E-06	5.97E-06	1.19E-07	5.79E-06	4.30E-08	5.97E-06	5.97E-06	5.97E-06
	Actinium-225	6.33E-07	1.48E-03	2.21E-08	1.48E-03	1.48E-03	1.94E-07	1.48E-03	1.02E-07	1.48E-03	1.48E-03	1.48E-03
	Francium-221	1.37E-06	1.61E-03	6.14E-08	1.61E-03	1.61E-03	4.52E-07	1.61E-03	2.65E-07	1.61E-03	1.61E-03	1.61E-03
	Astatine-217	0.00E+00	1.81E-03	0.00E+00	1.81E-03	1.81E-03	0.00E+00	1.81E-03	0.00E+00	1.81E-03	1.81E-03	1.81E-03
	Bismuth-213	6.08E-06	5.48E-05	3.08E-07	5.54E-05	5.52E-05	2.02E-06	5.49E-05	1.28E-06	5.52E-05	5.52E-05	5.51E-05
	Polonium-213 (97.84 %)	0.00E+00	2.14E-03	0.00E+00	2.14E-03	2.14E-03	0.00E+00	2.14E-03	0.00E+00	2.14E-03	2.14E-03	2.14E-03
	Thallium-209 (2.16 %)	9.28E-05	3.60E-05	4.77E-06	4.38E-05	4.01E-05	3.09E-05	3.63E-05	1.98E-05	4.01E-05	4.01E-05	3.83E-05
	Lead-209	0.00E+00	1.01E-05	0.00E+00	1.01E-05	1.01E-05	0.00E+00	1.01E-05	0.00E+00	1.01E-05	1.01E-05	1.01E-05
	Sum	1.05E-05	7.06E-03	5.04E-07	7.06E-03	7.06E-03	3.45E-06	7.06E-03	2.12E-06	7.06E-03	7.06E-03	7.06E-03
Tin-126	Antimony-126	1.30E-04	1.57E-05	6.78E-06	2.40E-05	2.03E-05	4.31E-05	1.60E-05	2.79E-05	2.03E-05	2.03E-05	1.88E-05
Uranium-235	Thorium-231	1.09E-06	8.55E-06	4.43E-08	8.88E-06	8.71E-06	3.49E-07	8.60E-06	2.10E-07	8.71E-06	8.71E-06	8.64E-06
Uranium-238	Thorium-234	1.53E-07	3.36E-06	1.61E-09	3.49E-06	3.49E-06	2.90E-08	3.43E-06	6.45E-09	3.49E-06	3.49E-06	3.49E-06
	Protactinium-234m	2.49E-07	4.23E-05	2.15E-09	4.26E-05	4.26E-05	6.82E-08	4.24E-05	8.60E-09	4.26E-05	4.26E-05	4.26E-05
	Protactinium-234	8.77E-05	2.61E-05	4.52E-06	3.31E-05	2.92E-05	2.91E-05	2.64E-05	1.89E-05	2.92E-05	2.92E-05	2.82E-05
Yttrium-90	Niobium-90	1.93E-04	2.22E-05	1.00E-05	3.62E-05	2.92E-05	6.43E-05	2.25E-05	4.15E-05	2.92E-05	2.92E-05	2.71E-05
Zirconium-93	Niobium-93m	3.41E-08	1.50E-06	3.58E-10	1.53E-06	1.53E-06	6.45E-09	1.51E-06	1.43E-09	1.53E-06	1.53E-06	1.53E-06

Table C2-7 Dose Conversion Factors, Decay Energies, Absorption Factors, and Radiation Dose Factors for Non-ROPC Daughter Radionuclides in Sediment[a]

Notes/Source

NA = Not applicable.

[a] Exposure to daughter radionuclides was evaluated for Columbia River sediment only.

[b] Daughter radionuclide designations are taken from Table 4-3.

[c] Alpha energy of the radionuclide (MeV) × proportion of disintegrations producing an α-particle (Eckerman and Ryman 1993, Table A.1).

[d] Absorbed fraction of energy E_α (assumed to be 1.0 for alpha radiations).

[e] Beta energy of the radionuclide (MeV) × proportion of disintegrations producing a β-particle (Eckerman and Ryman 1993, Table A.1).

[f] Absorbed fraction of energy E_β or E_γ (Blaylock, Frank, and O'Neal 1993; DOE 1997).

[g] Photon energy emitted during transition from a higher to a lower energy state (MeV) × proportion of disintegrations producing a γ-particle (Table A.1, Eckerman and Ryman 1993).

[h] Factor that, when multiplied by concentration of radionuclide in sediment, gives the external dose from sediment (Equation 8-56).

$DF_{sediment} = (0.5 \times Fs + Fin) \times CFa \times [(1 - \Phi_\beta) \times E_\beta n_\beta + (1 - \Phi_\gamma) \times E_\gamma n_\gamma]$ (Blaylock, Frank, and O'Neal 1993).

F_s = fraction of time receptor spends at the sediment-water interface (unitless),

F_{in} = fraction of time receptor spends buried in sediment (unitless), and

CFa = conversion factor to go from MeV/nt to g-rad/pCi-d (5.12×10^{-5}).

[i] Factor that, when multiplied by concentration of radionuclide in tissue, gives the internal dose from food and soil ingestion (Equation 8-28).

$DF_{int} = (QF \times E_\alpha n_\alpha \times \Phi_\alpha + E_\beta n_\beta \times \Phi_\beta + E_\gamma n_\gamma \times \Phi_\gamma) \times CFa$ (Sample and others 1997);

QF = quality factor to account for greater biological effectiveness of alpha particles (5 for alpha particles).

Appendix C-3

Toxicity Reference Values for Plants, Terrestrial Invertebrates, Mammals, Birds, Surface Water Organisms and Sediment-Dwelling Biota

Appendix C-3
Toxicity Reference Values for Plants, Terrestrial Invertebrates, Mammals, Birds, Surface Water Organisms and Sediment-Dwelling Biota

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Acronyms and Terms used in Appendix C-3

AET	Washington State Department of Ecology apparent effects threshold (Ecology 1994; Ecology 1997)
CAS	Chemical Abstracts Service
COPC	chemical of potential concern
DCF	duration conversion factor; 1 if chronic, 0.1 if subchronic (Sample and others 1996) or inferred from information presented in EPA (1999), Table E-5
DEHP	Bis (2-ethylhexyl) phthalate
EC	concentration that caused the reported effect
EC20	concentration at which an effect was observed in 20 % of tested individuals
EC50	concentration at which an effect was observed in 50 % of tested individuals
ECF	endpoint conversion factor; 1 if NOAEL, 0.1 if LOAEL (Sample and others 1996) or inferred from information presented in EPA (1999), Table E-5
ED	dose that caused the reported effect
EqP	equilibrium partitioning, assumes: 1 toxicity of sediment is due to COPC dissolved in porewater 2 toxicity in porewater is the same as toxicity in surface water 3 concentration of COPC in porewater is equal to concentration in sediment divided by K_{oc} (Jones and others 1997) The sediment TRV is calculated by multiplying the freshwater TRV by K_{oc} and TOC.
ER-L	National Oceanic and Atmospheric Administration effects range-low (Long and others 1995; Ingersoll and others 1996)
K_{oc}	soil carbon partition coefficient
LC50	concentration lethal to 50 % of tested individuals
LC100	concentration lethal to 100 % of tested individuals
LCV	lowest chronic value
LEL	Ontario Ministry of the Interior lowest effect level (Persaud and others 1993)
LOEC	lowest concentration at which an effect was observed
LOEL	lowest exposure level at which an effect was observed
LOAEL	lowest observed adverse effects level
NAWQC	National Ambient Water Quality Criteria
NOAEL	no observed adverse effects level
NOEC	highest concentration at which an effect was not observed

PCDD	Polychlorinated dibenzo-p-dioxin
ROPC	radionuclide of potential concern
Tier II SCV	secondary chronic value calculated according to Great Lakes Initiative methods
TOC	total organic carbon
TRV	toxicity reference value

References for Appendix C-3

Project Documents

None

Codes and Standards

None

Other Documents

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Hierarchy of References for Toxicity Data

Table C3-1, Terrestrial plants (section 8.3.1.1) - the hierarchy of choices is: 1) EPA (1999), 2) Model Toxics Control Act (MTCA) (Ecology 2001), 3) Efroymson and others (1997a), and 4) the Phytotox database.

Table C3-2, Terrestrial invertebrates (section 8.3.1.1) - the hierarchy of choices is: 1) EPA (1999), 2) MTCA (Ecology 2001), 3) Efroymson and others (1997b), and 4) other published literature.

Table C3-3, Ingestion TRVs for terrestrial mammals (sections 8.3.1.2 and 8.3.2.2) - the hierarchy of choices is: 1) EPA (1999), 2) Sample and others (1996), and 3) ECOTOXicology database system (EPA 2002).

Table C3-4, Ingestion TRVs for terrestrial birds (section 8.3.1.2 and 8.3.2.2) - the hiearchy of choices is: 1) EPA (1999), 2) Sample and others (1996), and 3) ECOTOXicology database system (EPA 2002).

Table C3-5, Aquatic biota (section 8.3.2.1) - the hierarchy of choices is: 1) EPA (1999), 2) MTCA (Ecology 2001), 3) National Ambient Water Quality Criteria, (NAWQC) (tabulated by Suter and Tsao 1996), 4) final chronic values (tabulated by Suter and Tsao 1996), 5) Tier II secondary chronic values (SCV) (tabulated by Suter and Tsao 1996), and 6) other published data. Methods to calculate NAWQC and Tier II SCV values are presented in Suter and Tsao (1996).

Table C3-6, Chinook salmon and other salmonids (section 8.3.2.1) - the hierarchy of choices is: 1) sensitive species EC20 from Suter and Tsao (1996), 2) other published data in which salmonid TRVs are lower than general aquatic TRVs, 3) EPA (1999), 4) NAWQC, 5) Tier II chronic values, and 6) other published data. Methods to calculate NAWQC and Tier II SCV values are presented in Suter and Tsao (1996).

Table C3-7, Benthic invertebrates (section 8.3.2.1) - the hierarchy of choices is: 1) EPA (1999), 2) no effect levels and lowest effect levels from Persaud and others (1993), 3) apparent effects thresholds (Ecology 1994), and 4) values published by Ingersoll and others (1996). For values not found in those sources, an equilibrium partitioning approach was used as described by Jones, Suter, and Hull (1997).

Values for hexavalent chromium, which is more toxic than trivalent chromium, were used for all receptors.

Data for Aroclor-1254 was used as representative of polychlorinated biphenyl mixtures.

Table C3-1 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Plants to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test Duration	Endpoint	Test species	Endpoint concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
Organic Compounds					(µg/kg)				(µg/kg)	
Aromatic Halogenated Hydrocarbons										
2,3,4,6-Tetrachlorophenol	58-90-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Chloro-3-methylphenol	59-50-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Aromatic Nonhalogenated Hydrocarbons										
2-Nitrotoluene	88-72-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Nitrobiphenyl	92-93-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzaldehyde	100-52-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzene	71-43-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzyl alcohol	100-51-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl benzene	100-41-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
m-Xylene	108-38-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Xylene	95-47-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Xylene	106-42-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Styrene	100-42-5	Chronic (14 days)	EC50	Lettuce	3.20E+05	No data	No data	Reduced growth from seed	3.00E+05	Hulzebos and others (1993) in Efroymson and others (1997a)
Toluene	108-88-3	No data	LOAEL	Soybean	2.00E+05	No data	No data	Reduced growth from seed	2.00E+05	Overcash and others (1982) in Efroymson and others (1997a)
Non-aromatic Nonhalogenated Hydrocarbons										
1,2-Epoxybutane	106-88-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Butadiene	106-99-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,4-Dioxane	123-91-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1-Methylpropyl alcohol	78-92-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1-Nitropropane	108-03-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,2,4-Trimethylpentane	540-84-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Butanone	78-93-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Butenaldehyde (2-Butenal)	4170-30-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Ethoxyethanol	110-80-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Heptanone	110-43-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Hexanone	591-78-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methoxyethanol	109-86-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methyl-2-propanol	75-65-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methyl-2-propenenitrile	126-98-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methylaziridine	75-55-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methylpropyl alcohol	78-83-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Pentanone	107-87-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Propanone (Acetone)	67-64-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Propene-1-ol	107-18-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Propyl alcohol	67-63-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Heptanone	106-35-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Methyl-1-butanol	123-51-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Methyl-2-butanone	563-80-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Pentanone	96-22-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Heptanone	123-19-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-1 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Plants to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test Duration	Endpoint	Test species	Endpoint concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
4-Methyl-2-pentanone	108-10-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Methyl-3-penten-2-one	141-79-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
5-Methyl-2-hexanone	110-12-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetaldehyde	75-07-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetamide	60-35-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetic acid	64-19-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetic acid ethyl ester	141-78-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetic acid n-butyl ester	123-86-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetonitrile	75-05-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acrolein	107-02-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acrylonitrile	107-13-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bis(isopropyl)ether	108-20-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Butane	106-97-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Carbon disulfide	75-15-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyanogen	460-19-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexane	110-82-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexanone	108-94-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexene	110-83-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclopentane	287-92-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl alcohol	64-17-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl ether	60-29-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl methacrylate	97-63-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formaldehyde	50-00-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formamide	75-12-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formic acid	64-18-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formic acid, methyl ester	107-31-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Glycidylaldehyde	765-34-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl acetate	79-20-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl alcohol	67-56-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl isocyanate	624-83-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl methacrylate	80-62-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl tert-butyl ether	1634-04-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylacetylene	74-99-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylcyclohexane	108-87-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N,N-Dimethylacetamide	127-19-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Butyl alcohol	71-36-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Heptane	142-82-5	Chronic (14 days)	EC50	Lettuce	>1.00E+06	No data	No data	Reduced growth from seed	1.00E+06	Hulzebos and others (1993) in Efroymson and others (1997a)
n-Hexane	110-54-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitromethane	75-52-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Nonane	111-84-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Octane	111-65-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Pentane	109-66-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Propionaldehyde	123-38-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-1 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Plants to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test Duration	Endpoint	Test species	Endpoint concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
n-Propyl alcohol	71-23-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Valeraldehyde	110-62-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Oxirane	75-21-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Cymene	99-87-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phosgene	75-44-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propargyl alcohol	107-19-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propionic acid	79-09-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propionitrile	107-12-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propylene glycol monomethyl ether	107-98-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-tert-Butyltoluene	98-51-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Triethylamine	121-44-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trimethylamine	75-50-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Vinyl acetate	108-05-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Non-aromatic Halogenated Hydrocarbons										
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,1,2-Tetrachloroethane	630-20-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,1-Trichloroethane	71-55-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,2,2-Tetrachloroethane	79-34-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,2,2-Tetrachloroethene	127-18-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,2-Trichloroethane	79-00-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,2-Trichloroethylene	79-01-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1-Dichloroethane	75-34-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1-Dichloroethene	75-35-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3-Trichloropropane	96-18-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dibromo-3-chloropropane	96-12-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichloroethane	107-06-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichloroethylene	540-59-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichloropropane	78-87-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Dichloropropene	542-75-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,4-Dichloro-2-butene	764-41-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1-Chloroethene	75-01-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,2-Dichloropropionic acid	75-99-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chloropropane	75-29-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Chloropropene (Allyl chloride)	107-05-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromochloromethane	74-97-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromodichloromethane	75-27-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromoethene	593-60-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromoform	75-25-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromomethane	74-83-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Carbon tetrachloride	56-23-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorodibromomethane	124-48-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-1 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Plants to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test Duration	Endpoint	Test species	Endpoint concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
Chlorodifluoromethane	75-45-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloroethane	75-00-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloroform	67-66-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloromethane	74-87-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloropentafluoroethane	76-15-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
cis-1,2-Dichloroethene	156-59-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
cis-1,3-Dichloropropene	10061-01-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyanogen bromide	506-68-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyanogen chloride	506-77-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichlorodifluoromethane	75-71-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichlorofluoromethane	75-43-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloromethane	75-09-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Difluorodibromomethane	75-61-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexafluoroacetone	684-16-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Iodomethane	74-88-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylene bromide	74-95-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachloroethane	76-01-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
trans-1,2-Dichloroethylene	156-60-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
trans-1,3-Dichloropropene	10061-02-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichloroacetic acid	76-03-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichlorofluoroethane	27154-33-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichlorofluoromethane	75-69-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trifluorobromomethane	75-63-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dioxin and Furan Compounds (PCDDs/PCDFs)										
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzofuran	132-64-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Octachlorodibenzo(p)dioxin	3268-87-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Octachlorodibenzofuran	39001-02-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Total dioxins and dibenzofurans	No CAS #	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-1 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Plants to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test Duration	Endpoint	Test species	Endpoint concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
Polychlorinated Biphenyls (PCBs)										
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Polychlorinated biphenyls (PCBs)[a]	1336-36-3	Chronic	NOAEL	Soybean	1.00E+04	No data	No data	Shoot weight reduced	1.00E+04	Weber and Mrozek (1979) in EPA (1999)
Phthalates										
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Butylbenzyl phthalate	85-68-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibutyl phthalate	84-74-2	Subchronic	LOAEL	Corn and soybean	2.00E+05	No data	No data	Fresh weight reduced	2.00E+05	Overcash and others (1982) in Efroymson and others (1997a)
Diethyl phthalate	84-66-2	Subchronic	EC50	Lettuce	1.34E+05	No data	No data	No data	1.00E+05	Hulzebos and others (1993) in Efroymson and others (1997a)
Dimethyl phthalate	131-11-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Dioctyl phthalate	117-84-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)										
2-Chloronaphthalene	91-58-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methyl naphthalene	91-57-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
5-Nitroacenaphthene	602-87-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acenaphthene	83-32-9	Chronic (14 days)	EC50	Lettuce	2.50E+04	No data	No data	Reduced growth from seed	2.00E+04	Hulzebos and others (1993) in Efroymson and others (1997a)
Acenaphthylene	208-96-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Anthracene	120-12-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Fluorene	86-73-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Indene	95-13-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Naphthalene	91-20-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phenanthrene	85-01-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pyrene	129-00-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)										
3-Methylcholanthrene	56-49-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
5-Methylchrysene	3697-24-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[a]anthracene	56-55-3	NA	NA	NA	NA	NA	NA	NA	1.20E+03	TRV for benzo(a)pyrene used as surrogate (EPA 1999)

Table C3-1 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Plants to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test Duration	Endpoint	Test species	Endpoint concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
Benzo[a]pyrene	50-32-8	Chronic	NOAEL	Wheat	1.20E+03	No data	No data	No data	1.20E+03	Sims and Overcash (1983) in EPA (1999)
Benzo[a,i]pyrene	191-30-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[b]fluoranthene	205-99-2	Chronic	NOAEL	Wheat	1.20E+03	No data	No data	No data	1.20E+03	Sims and Overcash (1983) in EPA (1999)
Benzo[e]pyrene	192-97-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[g,h,i]perylene	191-24-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[j]fluoranthene	205-82-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[k]fluoranthene	207-08-9	NA	NA	NA	NA	NA	NA	NA	1.20E+03	TRV for benzo(a)pyrene used as surrogate (EPA 1999)
Chrysene	218-01-9	NA	NA	NA	NA	NA	NA	NA	1.20E+03	TRV for benzo(a)pyrene used as surrogate (EPA 1999)
Dibenz[a,h]acridine	226-36-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenz[a,h]anthracene	53-70-3	NA	NA	NA	NA	NA	NA	NA	1.20E+03	TRV for benzo(a)pyrene used as surrogate (EPA 1999)
Dibenz[a,j]acridine	224-42-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,e]fluoranthene	5385-75-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,e]pyrene	192-65-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,h]fluoranthene	No CAS #	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,h]pyrene	189-64-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,i]pyrene	189-55-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Fluoranthene	206-44-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexachloronaphthalene	1335-87-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Indeno[1,2,3-cd]pyrene	193-39-5	NA	NA	NA	NA	NA	NA	NA	1.20E+03	TRV for benzo(a)pyrene used as surrogate (EPA 1999)
Octachloronaphthalene	2234-13-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachloronaphthalene	1321-64-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tetrachloronaphthalene	1335-88-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichloronaphthalene	1321-65-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Light Substituted Benzene Compounds (molecular weight <200 g/mole)										
1,2,3-Trichlorobenzene	87-61-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,4-Trichlorobenzene	120-82-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,4-Trimethyl benzene	95-63-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichlorobenzene	95-50-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3,5-Trimethyl benzene	108-67-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Dichlorobenzene	541-73-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Dinitrobenzene	99-65-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,4-Dichlorobenzene	106-46-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,4-Dinitrobenzene	100-25-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4,5-Trichlorophenol	95-95-4	Chronic (14 days)	EC50	Lettuce	4.30E+03	No data	No data	Reduced growth from seed	4.00E+03	van Gestel and others (1996) in Efroymson and others (1997a)
2,4,6-Trichlorophenol	88-06-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-Dichlorophenol	120-83-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-Dimethylphenol	105-67-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-1 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Plants to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test Duration	Endpoint	Test species	Endpoint concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
2,4-Dinitrophenol	51-28-5	Chronic (21 days)	LOEC	Soybean	2.00E+04	No data	No data	Reduced growth from seed	2.00E+04	Overcash and others (1982) in Efroymson and others (1997a)
2,4-Dinitrotoluene	121-14-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,6-Dinitrotoluene	606-20-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chlorophenol	95-57-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chlorotoluene	95-49-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Nitrophenol	88-75-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,6-Dinitro-o-cresol	534-52-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Chlorotoluene	106-43-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Nitrophenol	100-02-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
alpha-Methylstyrene	98-83-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Aniline	62-53-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzotrichloride	98-07-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzyl chloride	100-44-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromobenzene	108-86-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorobenzene	108-90-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cumene	98-82-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
m-Cresol	108-39-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Butyl benzene	104-51-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrobenzene	98-95-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Propyl benzene	103-65-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Cresol	95-48-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Dinitrobenzene	528-29-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Nitroaniline	88-74-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Toluidine	95-53-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Chloroaniline	106-47-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Cresol	106-44-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phenol	108-95-2	Chronic (14 days)	EC50	Lettuce	7.90E+04	No data	No data	Reduced growth from seed	7.00E+04	Hulzebos and others (1993) in Efroymson and others (1997a)
p-Nitrochlorobenzene	100-00-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Toluidine	106-49-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
sec-Butyl benzene	135-98-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
tert-Butyl benzene	98-06-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Toluene-2,6-diamine	823-40-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trimethyl benzene	25551-13-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Other Light Semivolatile Compounds (molecular weight <200 g/mole)										
1,1'-Biphenyl	92-52-4	Chronic (14 days)	EC50	Lettuce	6.80E+04	No data	No data	Reduced growth from seed	6.00E+04	Hulzebos and others (1993) in Efroymson and others (1997a)
1,1-Dimethylhydrazine	57-14-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dimethylhydrazine	540-73-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Diphenylhydrazine	122-66-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Propane sultone	1120-71-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-Toluene diisocyanate	584-84-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chloroacetophenone	532-27-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-1 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Plants to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test Duration	Endpoint	Test species	Endpoint concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
2-Propenoic acid	79-10-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,4'-Methylenedianiline	101-77-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetophenone	98-86-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzoic acid	65-85-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
bis(2-Chloroethoxy)methane	111-91-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
bis(2-Chloroethyl) ether	111-44-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorocyclopentadiene	41851-50-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexanol	108-93-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloroisopropyl ether	108-60-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloromethyl ether	542-88-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloropentadiene	61626-71-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dimethyl sulfate	77-78-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dimethylaniline	121-69-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Di-n-propylnitrosamine	621-64-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Diphenyl ether	101-84-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Epichlorohydrin	106-89-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl carbamate (urethane)	51-79-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl methanesulfonate	62-50-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene dibromide	106-93-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene glycol	107-21-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene glycol monobutyl ether	111-76-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene glycol monoethyl ether acetate	111-15-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene thiourea	96-45-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Furfural	98-01-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Maleic hydrazide	123-33-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Malononitrile	109-77-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl styrene (mixed isomers)	25013-15-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylhydrazine	60-34-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N,N-Diphenylamine	122-39-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitric acid, propyl ester	627-13-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N-Nitrosodi-n-butylamine	924-16-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N-Nitrosomorpholine	59-89-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N-Nitroso-N,N-dimethylamine	62-75-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Anisidine	90-04-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Oxalic acid	144-62-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phthalic anhydride	85-44-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Phthalic acid	100-21-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pyridine	110-86-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Quinoline	91-22-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Quinone	106-51-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Safrole	94-59-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tetrahydrofuran	109-99-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)										
1,2,4,5-Tetrachlorobenzene	95-94-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-1 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Plants to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test Duration	Endpoint	Test species	Endpoint concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
1,3,5-Trinitrobenzene	99-35-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-sec-Butyl-4,6-dinitrophenol	88-85-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3'-Dichlorobenzidine	91-94-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3'-Dimethoxybenzidine	119-90-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Bromophenylphenyl ether	101-55-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ammonium perfluorooctanoate	3825-26-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Azobenzene	103-33-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	96-69-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Captan	133-06-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorobenzilate	510-15-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibutylphosphate	107-66-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dimethyl aminoazobenzene	60-11-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexachlorobenzene	118-74-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexachlorobutadiene	87-68-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexachlorocyclopentadiene	77-47-4	Acute	EC50	Lettuce	1.00E+04	1.0E-01	1.0E-01	No data	1.00E+02	Hulzebos and others (1993) in EPA (1999)
Hexachloroethane	67-72-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexachlorophene	70-30-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexamethylene-1,5-diisocyanate	822-06-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Mirex	2385-85-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrofen	1836-75-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachlorobenzene	608-93-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachloronitrobenzene	82-68-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachlorophenol	87-86-5	Chronic	LOAEL	Rice	1.73E+04	1.0E+00	1.0E-01	No data	1.73E+03	Nagasawa and others (1981) in EPA (1999)
Picric acid	88-89-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pronamide	23950-58-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Strychnine	57-24-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Terphenyls	26140-60-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tributyl phosphate	126-73-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trifluralin	1582-09-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Triphenylamine	603-34-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Herbicides and Organochlorinated Pesticides										
2,4,5-T	93-76-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-D and esters	94-75-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,4'-DDD	72-54-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,4'-DDE	72-55-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,4'-DDT	50-29-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Aldrin	309-00-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
alpha-BHC	319-84-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
beta-BHC	319-85-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlordane	57-74-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-1 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Plants to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test Duration	Endpoint	Test species	Endpoint concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
Delta-BHC	319-86-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dieldrin	60-57-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Endothall	145-73-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Endrin	72-20-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
gamma-BHC (Lindane)	58-89-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Heptachlor	76-44-8	Chronic	NOAEL	Carrot	1.00E+03	No data	No data	No data	1.00E+03	Ahrens and Kring (1968) in EPA (1999)
Isodrin	465-73-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methoxychlor	72-43-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Silvex (2,4,5-TP)	93-72-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Toxaphene	8001-35-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Inorganic Chemicals and Compounds					(mg/kg)				(mg/kg)	
	Metals									
Aluminum	7429-90-5	Subchronic	NOAEL	White clover	5.00E+01	1.0E-01	1.0E+00	Reduced seedling establishment	5.00E+00	Mackay and others (1990) in EPA (1999)
Antimony	7440-36-0	Not specified	Not specified	Not specified	5.00E+00	1.0E+00	1.0E-01	No data	5.00E-01	Kabata-Pendias and Pendias (1992) in EPA (1999)
Arsenic	7440-38-2	Chronic	LOAEL	Corn	1.00E+01	1.0E+00	1.0E-01	Reduced yield	1.00E+00	Woolson and others (1971) in EPA (1999)
Barium	7440-39-3	Chronic	LOAEL	Barley	5.00E+02	1.0E+00	1.0E-02	Reduced shoot growth	5.00E+00	Chaudry and others (1977) in EPA (1999)
Beryllium	7440-41-7	Not specified	Not specified	Not specified	1.00E+01	1.0E-01	1.0E-01	No data	1.00E-01	Kabata-Pendias and Pendias (1992) in EPA (1999)
Bismuth	7440-69-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Boron	7440-42-8	Chronic	LOAEL	Corn seedlings	5.00E-01	No data	No data	Reduced seedling growth	5.00E-01	John and others (1977) in Efroymson and others (1997a)
Cadmium	7440-43-9	Chronic	LOAEL	Spruce seedlings	2.00E+00	1.0E+00	1.0E-01	Reduced seedling growth	2.00E-01	Burton and others (1984) in EPA (1999)
Calcium	7440-70-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chromium[b]	18540-29-9	Subchronic	EC50	Lettuce	1.80E+00	1.0E-01	1.0E-01	Reduced growth	1.80E-02	Adema and Hazen (1989) in EPA (1999)
Cobalt	7440-48-4	Not specified	Not specified	Not specified	2.00E+01	No data	No data	Unspecified toxic effects	2.00E+01	Kabata-Pendias and Pendias (1984) in Efroymson and others (1997a)
Copper	7440-50-8	Chronic	LOAEL	Barley	1.00E+01	1.0E+00	1.0E-01	No data	1.00E+00	Toivonem and Hofstra (1979) in EPA (1999)
Iron	7439-89-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Lead	7439-92-1	Chronic	LOAEL	Senna	4.60E+01	1.0E+00	1.0E-01	No data	4.60E+00	Krishnayya and Bedi (1986) in EPA (1999)
Lithium	7439-93-2	Subchronic	LOAEL	Orange seedlings	2.00E+00	No data	No data	Unspecified toxic effects	2.00E+00	Aldrich and others (1951) in Efroymson and others (1997a)
Magnesium	7439-95-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Manganese	7439-96-5	Chronic (17 days)	LOEC	Bush beans	5.00E+02	No data	No data	Stem weight reduced	5.00E+02	Wallace and others (1977) in Efroymson and others (1997a)

Table C3-1 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Plants to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test Duration	Endpoint	Test species	Endpoint concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
Mercury	7439-97-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Mercury - Hg+2	7487-94-7	Acute	NOEC	Barley	3.49E+01	1.0E-01	1.0E-01	No data	3.49E-01	Lenka and others (1992) in EPA (1999)
Methylmercury	22967-92-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Molybdenum	7439-98-7	Not specified	Not specified	Not specified	2.00E+00	No data	No data	Unspecified toxic effects	2.00E+00	Kabata-Pendias and Pendias (1984) in Efroymson and others (1997a)
Nickel	7440-02-0	Chronic	NOAEL	Bush bean	2.50E+01	No data	No data	Reduced shoot growth	2.50E+01	Wallace and others (1977) in EPA (1999)
Potassium	7440-09-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Rhodium	7440-16-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Selenium	7782-49-2	Subchronic	NOAEL	Alfalfa	5.00E-01	1.0E-01	1.0E+00	Shoot weight reduced	5.00E-02	Wan and others (1988) in EPA (1999)
Silicon	7440-21-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Silver	7440-22-4	Not specified	Not specified	Not specified	2.00E+00	1.0E-01	1.0E-01	No data	2.00E-02	Kabata-Pendias and Pendias (1992) in EPA (1999)
Sodium	7440-23-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Strontium	7440-24-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tantalum	7440-25-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Thallium	7440-28-0	Not specified	Not specified	Not specified	1.00E+00	1.0E-01	1.0E-01	No data	1.00E-02	Kabata-Pendias and Pendias (1992) in EPA (1999)
Tin	7440-31-5	Chronic (17 days)	NOEC	Bush beans	5.00E+01	No data	No data	Shoot weight reduced	5.00E+01	Romney and others (1975) in Efroymson and others (1997a)
Tungsten	7440-33-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Uranium	7440-61-1	No data	LOEC	Swiss chard	5.00E+00	No data	No data	Reduction in root weight	5.00E+00	Sheppard and others (1983) in Efroymson and others (1997a)
Vanadium	7440-62-2	No data	No data	Unspecified plants	2.00E+00	No data	No data	Unspecified toxic effects	2.00E+00	EPA (1980) in Efroymson and others (1997a)
Yttrium	7440-65-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Zinc	7440-66-6	Chronic	LOAEL	Spring barley	9.00E+00	1.0E+00	1.0E-01	No data	9.00E-01	Davis, Beckett, and Wollan (1978) in EPA (1999)
Zirconium	7440-67-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
	Non-metals and Anions									
Ammonia/Ammonium	7664-41-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromide	24959-67-9	Chronic	LOAEL	Unspecified plants	1.00E+01	No data	No data	Unspecified toxic effects	1.00E+01	Kabata-Pendias and Pendias (1984) in Efroymson and others (1997a)
Chloride	16887-00-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyanide	57-12-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Fluoride	16984-48-8	Not specified	No data	Unspecified plants	2.00E+02	No data	No data	Reduction in growth	2.00E+02	Kabata-Pendias and Pendias (1984) in Efroymson and others (1997a)
Hydroxide	14280-30-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-1 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Plants to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test Duration	Endpoint	Test species	Endpoint concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
Iodine	7553-56-2	Chronic (97 days)	LOEC	Tomatoes grown from seed	4.00E+00	No data	No data	Reduction in top weight	4.00E+00	Newton and Toth (1952) in Efroymson and others (1997a)
Nitrate	14797-55-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrite	14797-65-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phosphate	14265-44-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phosphorus	7723-14-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Sulfate	14808-79-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Total Sulfur	63705-05-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Criteria Pollutants										
Carbon monoxide	630-08-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrogen dioxide	10102-44-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ozone	10028-15-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Particulate matter	No CAS #	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Sulfur dioxide	7446-09-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Radionuclides										
All radionuclides combined (rad/d)[c]	No CAS #	Chronic	Adverse effects	Plants	NA	NA	NA	Population effects	1.00E+00	IAEA (1992)

Notes/Sources

No data = No data available.
NA = Not applicable.
CAS = Chemical Abstracts Service.
EC = Concentration that caused the reported effect.
DCF = Duration conversion factor; 1 if chronic, 0.1 if subchronic (Sample and others 1996) or inferred from information presented in EPA (1999) Table E-5.
ECF = Endpoint conversion factor; 1 if NOAEL, 0.1 if LOAEL (Sample and others 1996) or inferred from information presented in EPA (1999) Table E-5.
TRV = Toxicity reference value.
LC50 = Concentration lethal to 50 % of tested individuals.
LOAEL = Lowest observed adverse effect level.
NOAEL = No observed adverse effects level.
LOEC = Lowest concentration at which an effect was observed.
NOEC = Highest concentration at which an effect was not observed.

[a] Data for Aroclor-1254 used as representative of polychlorinated biphenyl mixtures.

[b] Values for hexavalent chromium, which is more toxic than trivalent chromium.

[c] TRV is not applicable to single radionuclides. Combined external and internal radiation exposure for plants from all radionuclides combined cannot exceed 1.0 rad/d.

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
Organic Compounds			(µg/kg)	
Aromatic Halogenated Hydrocarbons				
2,3,4,6-Tetrachlorophenol	58-90-2	No data	No TRV	No data
4-Chloro-3-methylphenol	59-50-7	No data	No TRV	No data
Aromatic Nonhalogenated Hydrocarbons				
2-Nitrotoluene	88-72-2	No data	No TRV	No data
4-Nitrobiphenyl	92-93-3	No data	No TRV	No data
Benzaldehyde	100-52-7	No data	No TRV	No data
Benzene	71-43-2	No data	No TRV	No data
Benzyl alcohol	100-51-6	No data	No TRV	No data
Ethyl benzene	100-41-4	No data	No TRV	No data
m-Xylene	108-38-3	No data	No TRV	No data
o-Xylene	95-47-6	No data	No TRV	No data
p-Xylene	106-42-3	No data	No TRV	No data
Styrene	100-42-5	No data	No TRV	No data
Toluene	108-88-3	No data	No TRV	No data
Non-aromatic Nonhalogenated Hydrocarbons				
1,2-Epoxybutane	106-88-7	No data	No TRV	No data
1,3-Butadiene	106-99-0	No data	No TRV	No data
1,4-Dioxane	123-91-1	No data	No TRV	No data
1-Methylpropyl alcohol	78-92-2	No data	No TRV	No data
1-Nitropropane	108-03-2	No data	No TRV	No data
2,2,4-Trimethylpentane	540-84-1	No data	No TRV	No data
2-Butanone	78-93-3	No data	No TRV	No data
2-Butenaldehyde (2-Butenal)	4170-30-3	No data	No TRV	No data
2-Ethoxyethanol	110-80-5	No data	No TRV	No data
2-Heptanone	110-43-0	No data	No TRV	No data
2-Hexanone	591-78-6	No data	No TRV	No data
2-Methoxyethanol	109-86-4	No data	No TRV	No data
2-Methyl-2-propanol	75-65-0	No data	No TRV	No data

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
2-Methyl-2-propenenitrile	126-98-7	No data	No TRV	No data
2-Methylaziridine	75-55-8	No data	No TRV	No data
2-Methylpropyl alcohol	78-83-1	No data	No TRV	No data
2-Pentanone	107-87-9	No data	No TRV	No data
2-Propanone (Acetone)	67-64-1	No data	No TRV	No data
2-Propene-1-ol	107-18-6	No data	No TRV	No data
2-Propyl alcohol	67-63-0	No data	No TRV	No data
3-Heptanone	106-35-4	No data	No TRV	No data
3-Methyl-1-butanol	123-51-3	No data	No TRV	No data
3-Methyl-2-butanone	563-80-4	No data	No TRV	No data
3-Pentanone	96-22-0	No data	No TRV	No data
4-Heptanone	123-19-3	No data	No TRV	No data
4-Methyl-2-pentanone	108-10-1	No data	No TRV	No data
4-Methyl-3-penten-2-one	141-79-7	No data	No TRV	No data
5-Methyl-2-hexanone	110-12-3	No data	No TRV	No data
Acetaldehyde	75-07-0	No data	No TRV	No data
Acetamide	60-35-5	No data	No TRV	No data
Acetic acid	64-19-7	No data	No TRV	No data
Acetic acid ethyl ester	141-78-6	No data	No TRV	No data
Acetic acid n-butyl ester	123-86-4	No data	No TRV	No data
Acetonitrile	75-05-8	No data	No TRV	No data
Acrolein	107-02-8	No data	No TRV	No data
Acrylonitrile	107-13-1	No data	No TRV	No data
Bis(isopropyl)ether	108-20-3	No data	No TRV	No data
Butane	106-97-8	No data	No TRV	No data
Carbon disulfide	75-15-0	No data	No TRV	No data
Cyanogen	460-19-5	No data	No TRV	No data
Cyclohexane	110-82-7	No data	No TRV	No data
Cyclohexanone	108-94-1	No data	No TRV	No data
Cyclohexene	110-83-8	No data	No TRV	No data
Cyclopentane	287-92-3	No data	No TRV	No data

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
Ethyl alcohol	64-17-5	No data	No TRV	No data
Ethyl ether	60-29-7	No data	No TRV	No data
Ethyl methacrylate	97-63-2	No data	No TRV	No data
Formaldehyde	50-00-0	No data	No TRV	No data
Formamide	75-12-7	No data	No TRV	No data
Formic acid	64-18-6	No data	No TRV	No data
Formic acid, methyl ester	107-31-3	No data	No TRV	No data
Glycidylaldehyde	765-34-4	No data	No TRV	No data
Methyl acetate	79-20-9	No data	No TRV	No data
Methyl alcohol	67-56-1	No data	No TRV	No data
Methyl isocyanate	624-83-9	No data	No TRV	No data
Methyl methacrylate	80-62-6	No data	No TRV	No data
Methyl tert-butyl ether	1634-04-4	No data	No TRV	No data
Methylacetylene	74-99-7	No data	No TRV	No data
Methylcyclohexane	108-87-2	No data	No TRV	No data
N,N-Dimethylacetamide	127-19-5	No data	No TRV	No data
n-Butyl alcohol	71-36-3	No data	No TRV	No data
n-Heptane	142-82-5	No data	No TRV	No data
n-Hexane	110-54-3	No data	No TRV	No data
Nitromethane	75-52-5	No data	No TRV	No data
n-Nonane	111-84-2	No data	No TRV	No data
n-Octane	111-65-9	No data	No TRV	No data
n-Pentane	109-66-0	No data	No TRV	No data
n-Propionaldehyde	123-38-6	No data	No TRV	No data
n-Propyl alcohol	71-23-8	No data	No TRV	No data
n-Valeraldehyde	110-62-3	No data	No TRV	No data
Oxirane	75-21-8	No data	No TRV	No data
p-Cymene	99-87-6	No data	No TRV	No data
Phosgene	75-44-5	No data	No TRV	No data
Propargyl alcohol	107-19-7	No data	No TRV	No data
Propionic acid	79-09-4	No data	No TRV	No data

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
Propionitrile	107-12-0	No data	No TRV	No data
Propylene glycol monomethyl ether	107-98-2	No data	No TRV	No data
p-tert-Butyltoluene	98-51-1	No data	No TRV	No data
Triethylamine	121-44-8	No data	No TRV	No data
Trimethylamine	75-50-3	No data	No TRV	No data
Vinyl acetate	108-05-4	No data	No TRV	No data
Non-aromatic Halogenated Hydrocarbons				
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	No data	No TRV	No data
1,1,1,2-Tetrachloroethane	630-20-6	No data	No TRV	No data
1,1,1-Trichloroethane	71-55-6	No data	No TRV	No data
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	No data	No TRV	No data
1,1,2,2-Tetrachloroethane	79-34-5	No data	No TRV	No data
1,1,2,2-Tetrachloroethene	127-18-4	No data	No TRV	No data
1,1,2-Trichloroethane	79-00-5	No data	No TRV	No data
1,1,2-Trichloroethylene	79-01-6	No data	No TRV	No data
1,1-Dichloroethane	75-34-3	No data	No TRV	No data
1,1-Dichloroethene	75-35-4	No data	No TRV	No data
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	No data	No TRV	No data
1,2,3-Trichloropropane	96-18-4	No data	No TRV	No data
1,2-Dibromo-3-chloropropane	96-12-8	No data	No TRV	No data
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	No data	No TRV	No data
1,2-Dichloroethane	107-06-2	No data	No TRV	No data
1,2-Dichloroethylene	540-59-0	No data	No TRV	No data
1,2-Dichloropropane	78-87-5	Mortality	7.00E+05	Neuhauser and others (1986) in Efroymson and others (1997b)
1,3-Dichloropropene	542-75-6	No data	No TRV	No data
1,4-Dichloro-2-butene	764-41-0	No data	No TRV	No data
1-Chloroethene	75-01-4	No data	No TRV	No data
2,2-Dichloropropionic acid	75-99-0	No data	No TRV	No data

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
2-Chloropropane	75-29-6	No data	No TRV	No data
3-Chloropropene (Allyl chloride)	107-05-1	No data	No TRV	No data
Bromochloromethane	74-97-5	No data	No TRV	No data
Bromodichloromethane	75-27-4	No data	No TRV	No data
Bromoethene	593-60-2	No data	No TRV	No data
Bromoform	75-25-2	No data	No TRV	No data
Bromomethane	74-83-9	No data	No TRV	No data
Carbon tetrachloride	56-23-5	No data	No TRV	No data
Chlorodibromomethane	124-48-1	No data	No TRV	No data
Chlorodifluoromethane	75-45-6	No data	No TRV	No data
Chloroethane	75-00-3	No data	No TRV	No data
Chloroform	67-66-3	No data	No TRV	No data
Chloromethane	74-87-3	No data	No TRV	No data
Chloropentafluoroethane	76-15-3	No data	No TRV	No data
cis-1,2-Dichloroethene	156-59-2	No data	No TRV	No data
cis-1,3-Dichloropropene	10061-01-5	No data	No TRV	No data
Cyanogen bromide	506-68-3	No data	No TRV	No data
Cyanogen chloride	506-77-4	No data	No TRV	No data
Dichlorodifluoromethane	75-71-8	No data	No TRV	No data
Dichlorofluoromethane	75-43-4	No data	No TRV	No data
Dichloromethane	75-09-2	No data	No TRV	No data
Difluorodibromomethane	75-61-6	No data	No TRV	No data
Hexafluoroacetone	684-16-2	No data	No TRV	No data
Iodomethane	74-88-4	No data	No TRV	No data
Methylene bromide	74-95-3	No data	No TRV	No data
Pentachloroethane	76-01-7	No data	No TRV	No data
trans-1,2-Dichloroethylene	156-60-5	No data	No TRV	No data
trans-1,3-Dichloropropene	10061-02-6	No data	No TRV	No data
Trichloroacetic acid	76-03-9	No data	No TRV	No data
Trichlorofluoroethane	27154-33-2	No data	No TRV	No data
Trichlorofluoromethane	75-69-4	No data	No TRV	No data

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
Trifluorobromomethane	75-63-8	No data	No TRV	No data
Dioxin and Furan Compounds (PCDDs/PCDFs)				
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	No data	No TRV	No data
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No data	No TRV	No data
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No data	No TRV	No data
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	No data	No TRV	No data
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No data	No TRV	No data
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	No data	No TRV	No data
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No data	No TRV	No data
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	No data	No TRV	No data
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No data	No TRV	No data
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	No data	No TRV	No data
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No data	No TRV	No data
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No data	No TRV	No data
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No data	No TRV	No data
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	Mortality	5.00E+02	Reinecke and Nash (1984) in EPA (1999)
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No data	No TRV	No data
Dibenzofuran	132-64-9	No data	No TRV	No data
Octachlorodibenzo(p)dioxin	3268-87-9	No data	No TRV	No data
Octachlorodibenzofuran	39001-02-0	No data	No TRV	No data
Total dioxins and dibenzofurans	No CAS #	No data	No TRV	No data
Polychlorinated Biphenyls (PCBs)				
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	No data	No TRV	No data
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	No data	No TRV	No data
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No data	No TRV	No data
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No data	No TRV	No data
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No data	No TRV	No data
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No data	No TRV	No data
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No data	No TRV	No data

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No data	No TRV	No data
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No data	No TRV	No data
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	No data	No TRV	No data
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	No data	No TRV	No data
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No data	No TRV	No data
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No data	No TRV	No data
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No data	No TRV	No data
Polychlorinated biphenyls (PCBs)[a]	1336-36-3	Mortality	2.51E+03	Rhett and others (1989) in EPA (1999)
	Phthalates			
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	No data	No TRV	No data
Butylbenzyl phthalate	85-68-7	No data	No TRV	No data
Dibutyl phthalate	84-74-2	No data	No TRV	No data
Diethyl phthalate	84-66-2	No data	No TRV	No data
Dimethyl phthalate	131-11-3	Mortality	2.00E+05	Neuhauser and others (1986) in Efroymson and others (1997b)
n-Dioctyl phthalate	117-84-0	No data	No TRV	No data
	Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)			
2-Chloronaphthalene	91-58-7	No data	No TRV	No data
2-Methyl naphthalene	91-57-6	No data	No TRV	No data
5-Nitroacenaphthene	602-87-9	No data	No TRV	No data
Acenaphthene	83-32-9	No data	No TRV	No data
Acenaphthylene	208-96-8	No data	No TRV	No data
Anthracene	120-12-7	No data	No TRV	No data
Fluorene	86-73-7	Mortality	3.00E+04	Neuhauser and others (1986) in Efroymson and others (1997b)
Indene	95-13-6	No data	No TRV	No data
Naphthalene	91-20-3	No data	No TRV	No data

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
Phenanthrene	85-01-8	No data	No TRV	No data
Pyrene	129-00-0	No data	No TRV	No data
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)				
3-Methylcholanthrene	56-49-5	No data	No TRV	No data
5-Methylchrysene	3697-24-3	No data	No TRV	No data
Benzo[a]anthracene	56-55-3	NA	2.50E+04	TRV for benzo(a)pyrene used as surrogate (EPA 1999)
Benzo[a]pyrene	50-32-8	Reduced growth	2.50E+04	van Brummelen and Stuijfzand (1993) in EPA (1999)
Benzo[a,i]pyrene	191-30-0	No data	No TRV	No data
Benzo[b]fluoranthene	205-99-2	NA	2.50E+04	TRV for benzo(a)pyrene used as surrogate (EPA 1999)
Benzo[e]pyrene	192-97-2	No data	No TRV	No data
Benzo[g,h,i]perylene	191-24-2	No data	No TRV	No data
Benzo[j]fluoranthene	205-82-3	No data	No TRV	No data
Benzo[k]fluoranthene	207-08-9	NA	2.50E+04	TRV for benzo(a)pyrene used as surrogate (EPA 1999)
Chrysene	218-01-9	NA	2.50E+04	TRV for benzo(a)pyrene used as surrogate (EPA 1999)
Dibenz[a,h]acridine	226-36-8	No data	No TRV	EPA (1999)
Dibenz[a,h]anthracene	53-70-3	NA	2.50E+04	TRV for benzo(a)pyrene used as surrogate (EPA 1999)
Dibenz[a,j]acridine	224-42-0	No data	No TRV	No data
Dibenzo[a,e]fluoranthene	5385-75-1	No data	No TRV	No data
Dibenzo[a,e]pyrene	192-65-4	No data	No TRV	No data

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
Dibenzo[a,h]fluoranthene	No CAS #	No data	No TRV	No data
Dibenzo[a,h]pyrene	189-64-0	No data	No TRV	No data
Dibenzo[a,i]pyrene	189-55-9	No data	No TRV	No data
Fluoranthene	206-44-0	No data	No TRV	No data
Hexachloronaphthalene	1335-87-1	No data	No TRV	No data
Indeno[1,2,3-cd]pyrene	193-39-5	NA	2.50E+04	TRV for benzo(a)pyrene used as surrogate (EPA 1999)
Octachloronaphthalene	2234-13-1	No data	No TRV	No data
Pentachloronaphthalene	1321-64-8	No data	No TRV	No data
Tetrachloronaphthalene	1335-88-2	No data	No TRV	No data
Trichloronaphthalene	1321-65-9	No data	No TRV	No data
Light Substituted Benzene Compounds (molecular weight <200 g/mole)				
1,2,3-Trichlorobenzene	87-61-6	Mortality	2.00E+04	van Gestel and Ma (1990) in Efroymson and others (1997b)
1,2,4-Trichlorobenzene	120-82-1	Mortality	2.00E+04	Neuhauser and others (1986) in Efroymson and others (1997b)
1,2,4-Trimethyl benzene	95-63-6	No data	No TRV	No data
1,2-Dichlorobenzene	95-50-1	No data	No TRV	No data
1,3,5-Trimethyl benzene	108-67-8	No data	No TRV	No data
1,3-Dichlorobenzene	541-73-1	No data	No TRV	No data
1,3-Dinitrobenzene	99-65-0	NA	2.26E+03	TRV for nitrobenzene used as surrogate (EPA 1999)
1,4-Dichlorobenzene	106-46-7	Mortality	2.00E+04	van Gestel and others (1991) in Efroymson and others (1997b)
1,4-Dinitrobenzene	100-25-4	No data	No TRV	No data

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
2,4,5-Trichlorophenol	95-95-4	Mortality	9.00E+03	van Gestel and Ma (1990) in Efroymson and others (1997b)
2,4,6-Trichlorophenol	88-06-2	Reduced cocoon production	1.00E+04	Neuhauser and others (1986) in Efroymson and others (1997b)
2,4-Dichlorophenol	120-83-2	No data	No TRV	No data
2,4-Dimethylphenol	105-67-9	No data	No TRV	No data
2,4-Dinitrophenol	51-28-5	No data	No TRV	No data
2,4-Dinitrotoluene	121-14-2	No data	No TRV	No data
2,6-Dinitrotoluene	606-20-2	No data	No TRV	No data
2-Chlorophenol	95-57-8	No data	No TRV	No data
2-Chlorotoluene	95-49-8	No data	No TRV	No data
2-Nitrophenol	88-75-5	No data	No TRV	No data
4,6-Dinitro-o-cresol	534-52-1	No data	No TRV	No data
4-Chlorotoluene	106-43-4	No data	No TRV	No data
4-Nitrophenol	100-02-7	Reduced cocoon production	7.00E+03	Neuhauser and others (1986) in Efroymson and others (1997b)
alpha-Methylstyrene	98-83-9	No data	No TRV	No data
Aniline	62-53-3	No data	No TRV	No data
Benzotrichloride	98-07-7	No data	No TRV	No data
Benzyl chloride	100-44-7	No data	No TRV	No data
Bromobenzene	108-86-1	No data	No TRV	No data
Chlorobenzene	108-90-7	Mortality	4.00E+04	van Gestel and others (1991) in Efroymson and others (1997b)
Cumene	98-82-8	No data	No TRV	No data
m-Cresol	108-39-4	No data	No TRV	No data

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
n-Butyl benzene	104-51-8	No data	No TRV	No data
Nitrobenzene	98-95-3	Mortality	2.26E+03	Neuhauser and others (1986) in EPA (1999)
n-Propyl benzene	103-65-1	No data	No TRV	No data
o-Cresol	95-48-7	No data	No TRV	No data
o-Dinitrobenzene	528-29-0	No data	No TRV	No data
o-Nitroaniline	88-74-4	No data	No TRV	No data
o-Toluidine	95-53-4	No data	No TRV	No data
p-Chloroaniline	106-47-8	Mortality	3.00E+04	van Gestel and Ma (1993) in Efroymson and others (1997b)
p-Cresol	106-44-5	No data	No TRV	No data
Phenol	108-95-2	Mortality	3.00E+04	Neuhauser and others (1986) in Efroymson and others (1997b)
p-Nitrochlorobenzene	100-00-5	No data	No TRV	No data
p-Toluidine	106-49-0	No data	No TRV	No data
sec-Butyl benzene	135-98-8	No data	No TRV	No data
tert-Butyl benzene	98-06-6	No data	No TRV	No data
Toluene-2,6-diamine	823-40-5	No data	No TRV	No data
Trimethyl benzene	25551-13-7	No data	No TRV	No data
Other Light Semivolatile Compounds (molecular weight <200 g/mole)				
1,1'-Biphenyl	92-52-4	No data	No TRV	No data
1,1-Dimethylhydrazine	57-14-7	No data	No TRV	No data
1,2-Dimethylhydrazine	540-73-8	No data	No TRV	No data
1,2-Diphenylhydrazine	122-66-7	No data	No TRV	No data
1,3-Propane sultone	1120-71-4	No data	No TRV	No data
2,4-Toluene diisocyanate	584-84-9	No data	No TRV	No data
2-Chloroacetophenone	532-27-4	No data	No TRV	No data

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
2-Propenoic acid	79-10-7	No data	No TRV	No data
4,4'-Methylenedianiline	101-77-9	No data	No TRV	No data
Acetophenone	98-86-2	No data	No TRV	No data
Benzoic acid	65-85-0	No data	No TRV	No data
bis(2-Chloroethoxy)methane	111-91-1	No data	No TRV	No data
bis(2-Chloroethyl) ether	111-44-4	No data	No TRV	No data
Chlorocyclopentadiene	41851-50-7	No data	No TRV	No data
Cyclohexanol	108-93-0	No data	No TRV	No data
Dichloroisopropyl ether	108-60-1	No data	No TRV	No data
Dichloromethyl ether	542-88-1	No data	No TRV	No data
Dichloropentadiene	61626-71-9	No data	No TRV	No data
Dimethyl sulfate	77-78-1	No data	No TRV	No data
Dimethylaniline	121-69-7	No data	No TRV	No data
Di-n-propylnitrosamine	621-64-7	No data	No TRV	No data
Diphenyl ether	101-84-8	No data	No TRV	No data
Epichlorohydrin	106-89-8	No data	No TRV	No data
Ethyl carbamate (urethane)	51-79-6	No data	No TRV	No data
Ethyl methanesulfonate	62-50-0	No data	No TRV	No data
Ethylene dibromide	106-93-4	No data	No TRV	No data
Ethylene glycol	107-21-1	No data	No TRV	No data
Ethylene glycol monobutyl ether	111-76-2	No data	No TRV	No data
Ethylene glycol monoethyl ether acetate	111-15-9	No data	No TRV	No data
Ethylene thiourea	96-45-7	No data	No TRV	No data
Furfural	98-01-1	No data	No TRV	No data
Maleic hydrazide	123-33-1	No data	No TRV	No data
Malononitrile	109-77-3	No data	No TRV	No data
Methyl styrene (mixed isomers)	25013-15-4	No data	No TRV	No data
Methylhydrazine	60-34-4	No data	No TRV	No data
N,N-Diphenylamine	122-39-4	No data	No TRV	No data
Nitric acid, propyl ester	627-13-4	No data	No TRV	No data
N-Nitrosodi-n-butylamine	924-16-3	No data	No TRV	No data

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
N-Nitrosomorpholine	59-89-2	No data	No TRV	No data
N-Nitroso-N,N-dimethylamine	62-75-9	No data	No TRV	No data
o-Anisidine	90-04-0	No data	No TRV	No data
Oxalic acid	144-62-7	No data	No TRV	No data
Phthalic anhydride	85-44-9	No data	No TRV	No data
p-Phthalic acid	100-21-0	No data	No TRV	No data
Pyridine	110-86-1	No data	No TRV	No data
Quinoline	91-22-5	No data	No TRV	No data
Quinone	106-51-4	No data	No TRV	No data
Safrole	94-59-7	No data	No TRV	No data
Tetrahydrofuran	109-99-9	No data	No TRV	No data
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)				
1,2,4,5-Tetrachlorobenzene	95-94-3	No data	No TRV	No data
1,3,5-Trinitrobenzene	99-35-4	No data	No TRV	No data
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	No data	No TRV	No data
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	No data	No TRV	No data
2-sec-Butyl-4,6-dinitrophenol	88-85-7	No data	No TRV	No data
3,3'-Dichlorobenzidine	91-94-1	No data	No TRV	No data
3,3'-Dimethoxybenzidine	119-90-4	No data	No TRV	No data
4-Bromophenylphenyl ether	101-55-3	No data	No TRV	No data
Ammonium perfluorooctanoate	3825-26-1	No data	No TRV	No data
Azobenzene	103-33-3	No data	No TRV	No data
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	96-69-5	No data	No TRV	No data
Captan	133-06-2	No data	No TRV	No data
Chlorobenzilate	510-15-6	No data	No TRV	No data
Dibutylphosphate	107-66-4	No data	No TRV	No data
Dimethyl aminoazobenzene	60-11-7	No data	No TRV	No data
Hexachlorobenzene	118-74-1	No data	No TRV	No data
Hexachlorobutadiene	87-68-3	No data	No TRV	No data
Hexachlorocyclopentadiene	77-47-4	No data	No TRV	No data

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
Hexachloroethane	67-72-1	No data	No TRV	No data
Hexachlorophene	70-30-4	No data	No TRV	No data
Hexamethylene-1,5-diisocyanate	822-06-0	No data	No TRV	No data
Mirex	2385-85-5	No data	No TRV	No data
Nitrofen	1836-75-5	No data	No TRV	No data
Pentachlorobenzene	608-93-5	Mortality	1.15E+03	van Gestel and others (1991) in EPA (1999)
Pentachloronitrobenzene	82-68-8	No data	No TRV	No data
Pentachlorophenol	87-86-5	Reduced hatching success	1.00E+04	van Gestel and others (1988) in EPA (1999)
Picric acid	88-89-1	No data	No TRV	No data
Pronamide	23950-58-5	No data	No TRV	No data
Strychnine	57-24-9	No data	No TRV	No data
Terphenyls	26140-60-3	No data	No TRV	No data
Tributyl phosphate	126-73-8	No data	No TRV	No data
Trifluralin	1582-09-8	No data	No TRV	No data
Triphenylamine	603-34-9	No data	No TRV	No data
Herbicides and Organochlorinated Pesticides				
2,4,5-T	93-76-5	No data	No TRV	No data
2,4-D and esters	94-75-7	No data	No TRV	No data
4,4'-DDD	72-54-8	No data	No TRV	No data
4,4'-DDE	72-55-9	No data	No TRV	No data
4,4'-DDT	50-29-3	No data	No TRV	No data
Aldrin	309-00-2	No data	No TRV	No data
alpha-BHC	319-84-6	No data	No TRV	No data
beta-BHC	319-85-7	No data	No TRV	No data
Chlordane	57-74-9	No data	No TRV	No data
Delta-BHC	319-86-8	No data	No TRV	No data
Dieldrin	60-57-1	No data	No TRV	No data
Endothall	145-73-3	No data	No TRV	No data

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
Endrin	72-20-8	No data	No TRV	No data
gamma-BHC (Lindane)	58-89-9	No data	No TRV	No data
Heptachlor	76-44-8	No data	No TRV	No data
Isodrin	465-73-6	No data	No TRV	No data
Methoxychlor	72-43-5	No data	No TRV	No data
Silvex (2,4,5-TP)	93-72-1	No data	No TRV	No data
Toxaphene	8001-35-2	No data	No TRV	No data
Inorganic Chemicals and Compounds			(mg/kg)	
	Metals			
Aluminum	7429-90-5	No data	No TRV	No data
Antimony	7440-36-0	No data	No TRV	No data
Arsenic	7440-38-2	Reduced cocoon production	2.50E-01	Fischer and Koszorus (1992) in EPA (1999)
Barium	7440-39-3	No data	No TRV	No data
Beryllium	7440-41-7	No data	No TRV	No data
Bismuth	7440-69-9	No data	No TRV	No data
Boron	7440-42-8	No data	No TRV	No data
Cadmium	7440-43-9	Reduced cocoon production	1.00E+01	Bengtsson and others (1986) in EPA (1999)
Calcium	7440-70-2	No data	No TRV	No data
Chromium[b]	18540-29-9	Mortality	2.00E-01	Abbasi and Soni (1983) in EPA (1999)
Cobalt	7440-48-4	No data	No TRV	No data
Copper	7440-50-8	Reduced cocoon production	3.20E+01	Spurgeon and others (1994) in EPA (1999)
Iron	7439-89-6	No data	No TRV	No data
Lead	7439-92-1	Cocoon production	1.00E+02	Bengtsson and others (1986) in EPA (1999)
Lithium	7439-93-2	No data	No TRV	No data
Magnesium	7439-95-4	No data	No TRV	No data

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
Manganese	7439-96-5	No data	No TRV	No data
Mercury	7439-97-6	No data	No TRV	No data
Mercury - Hg+2	7487-94-7	No data	2.50E+00	TRV for methyl mercury used as surrogate (EPA 1999)
Methylmercury	22967-92-6	Reduced segment regeneration and	2.50E+00	Beyer and others (1985) in EPA (1999)
Molybdenum	7439-98-7	No data	No TRV	No data
Nickel	7440-02-0	Reduced cocoon production	1.00E+02	Malecki and others (1982) in EPA (1999)
Potassium	7440-09-7	No data	No TRV	No data
Rhodium	7440-16-6	No data	No TRV	No data
Selenium	7782-49-2	Reduced cocoon production	7.70E+00	Fischer and Koszorus (1992) in EPA (1999)
Silicon	7440-21-3	No data	No TRV	No data
Silver	7440-22-4	No data	No TRV	No data
Sodium	7440-23-5	No data	No TRV	No data
Strontium	7440-24-6	No data	No TRV	No data
Tantalum	7440-25-7	No data	No TRV	No data
Thallium	7440-28-0	No data	No TRV	No data
Tin	7440-31-5	No data	No TRV	No data
Tungsten	7440-33-7	No data	No TRV	No data
Uranium	7440-61-1	No data	No TRV	No data
Vanadium	7440-62-2	No data	No TRV	No data
Yttrium	7440-65-5	No data	No TRV	No data
Zinc	7440-66-6	Reduced cocoon production	1.99E+02	Spurgeon and others (1994) in EPA (1999)
Zirconium	7440-67-7	No data	No TRV	No data
Non-metals and Anions				
Ammonia/Ammonium	7664-41-7	No data	No TRV	No data

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Effect	TRV (EC × DCF × ECF)	Source
Bromide	24959-67-9	No data	No TRV	No data
Chloride	16887-00-6	No data	No TRV	No data
Cyanide	57-12-5	No data	No TRV	No data
Fluoride	16984-48-8	No data	No TRV	No data
Hydroxide	14280-30-9	No data	No TRV	No data
Iodine	7553-56-2	No data	No TRV	No data
Nitrate	14797-55-8	No data	No TRV	No data
Nitrite	14797-65-0	No data	No TRV	No data
Phosphate	14265-44-2	No data	No TRV	No data
Phosphorus	7723-14-0	No data	No TRV	No data
Sulfate	14808-79-8	No data	No TRV	No data
Total Sulfur	63705-05-5	No data	No TRV	No data
Criteria Pollutants				
Carbon monoxide	630-08-0	No data	No TRV	No data
Nitrogen dioxide	10102-44-0	No data	No TRV	No data
Ozone	10028-15-6	No data	No TRV	No data
Particulate matter	No CAS #	No data	No TRV	No data
Sulfur dioxide	7446-09-5	No data	No TRV	No data
Radionuclides				
All radionuclides combined (rad/d)[c]	No CAS #	Population effects	1.00E+00	IAEA (1992)

Table C3-2 Derivation of Soil Toxicity Reference Values (TRVs) for Exposure of Terrestrial Invertebrates to COPCs and ROPCs

Notes/Sources

No data = No data available.
NA = Not applicable.
CAS = Chemical Abstracts Service.
EC = Concentration that caused the reported effect.
DCF = Duration conversion factor; 1 if chronic, 0.1 if subchronic (Sample and others 1996).
ECF = Endpoint conversion factor; 1 if NOAEL, 0.1 if LOAEL (Sample and others 1996) or inferred from data presented by Efroymson and others (1997b).
NOAEL = No observed adverse effect level.
TRV = Toxicity reference value.
[a] Data for Aroclor-1254 used as representative of polychlorinated biphenyl mixtures.
[b] Values for hexavalent chromium, which is more toxic than trivalent chromium.
[c] TRV is not applicable to single radionuclides. Combined external and internal radiation exposure for terrestrial invertebrates from all radionuclides combined cannot exceed 1 rad/d.

Table C3-3 Derivation of Toxicity Reference Values (TRVs) for Exposure of Mammal Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Organic Compounds						(µg/kgBW/d)				(µg/kgBW/d)	
Aromatic Halogenated Hydrocarbons											
2,3,4,6-Tetrachlorophenol	58-90-2	Subchronic	NOAEL	Rat	3.50E-01	2.50E+04	1.0E-01	1.0E+00	Reduced organ weight	2.50E+03	EPA (1986a) in IRIS (2002)
4-Chloro-3-methylphenol	59-50-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Aromatic Nonhalogenated Hydrocarbons											
2-Nitrotoluene	88-72-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Nitrobiphenyl	92-93-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzaldehyde	100-52-7	Subchronic	NOAEL	Rat	3.50E-01	1.43E+05	1.0E-01	1.0E+00	Forestomach lesions, kidney toxicity	1.43E+04	Kluwe and others (1983) in IRIS (2002)
Benzene	71-43-2	Chronic	LOAEL	Mouse	3.00E-02	2.64E+05	1.0E+00	1.0E-01	Impaired reproduction	2.64E+04	Nawrot and Staples (1979) in Sample and others (1996)
Benzyl alcohol	100-51-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl benzene	100-41-4	Subchronic	NOAEL	Rat	3.50E-01	9.71E+04	1.0E-01	1.0E+00	Liver and kidney toxicity	9.71E+03	Wolf and others (1956) in IRIS (2002)
m-Xylene	108-38-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Xylene	95-47-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Xylene	106-42-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Styrene	100-42-5	Subchronic	NOAEL	Dog	1.00E+01	2.00E+05	1.0E-01	1.0E+00	Liver toxicity	2.00E+04	Quast and others (1979) in IRIS (2002)
Toluene	108-88-3	Chronic	LOAEL	Mouse	3.00E-02	2.60E+05	1.0E+00	1.0E-01	Impaired reproduction	2.60E+04	Nawrot and Staples (1979) in Sample and others (1996)
Non-aromatic Nonhalogenated Hydrocarbons											
1,2-Epoxybutane	106-88-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Butadiene	106-99-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,4-Dioxane	123-91-1	Chronic	LOAEL	Guinea pig	No data	1.06E+06	1.0E+00	1.0E-01	Lung tumors	1.06E+05	Hoch-Ligeti and Argus (1970) in EPA (1999)
1-Methylpropyl alcohol	78-92-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1-Nitropropane	108-03-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,2,4-Trimethylpentane	540-84-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Butanone	78-93-3	Chronic	NOAEL	Rat	3.50E-01	1.77E+06	1.0E+00	1.0E+00	Decreased fetal birth weight	1.77E+06	Cox and others (1975) in IRIS (2002)
2-Butenaldehyde (2-Butenal)	4170-30-3	Acute	LD50	Rat	3.50E-01	8.00E+03	1.0E-01	1.0E-01	Mortality	8.00E+01	Rinehart (1967) in EPA (1999)
2-Ethoxyethanol	110-80-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Heptanone	110-43-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Hexanone	591-78-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methoxyethanol	109-86-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methyl-2-propanol	75-65-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methyl-2-propenenitrile	126-98-7	Subchronic	NOAEL	Dog	1.00E+01	3.40E+02	1.0E-01	1.0E+00	Increased liver enzyme levels	3.40E+01	Pozzani and others (1968) in IRIS (2002)
2-Methylaziridine	75-55-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methylpropyl alcohol	78-83-1	Subchronic	NOAEL	Rat	3.50E-01	3.16E+05	1.0E-01	1.0E+00	Hypoactivity and ataxia	3.16E+04	US EPA (1986b) in IRIS (2002)
2-Pentanone	107-87-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-3 Derivation of Toxicity Reference Values (TRVs) for Exposure of Mammal Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
2-Propanone (Acetone)	67-64-1	Subchronic	NOAEL	Rat	3.50E-01	1.00E+05	1.0E-01	1.0E+00	Liver and kidney toxicity	1.00E+04	EPA (1986g) in EPA (1999)
2-Propene-1-ol	107-18-6	Subchronic	NOAEL	Rat	3.50E-01	4.80E+03	1.0E-01	1.0E+00	Increased liver and kidney weights	4.80E+02	Carpanini and others (1978) in IRIS (2002)
2-Propyl alcohol	67-63-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Heptanone	106-35-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Methyl-1-butanol	123-51-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Methyl-2-butanone	563-80-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Pentanone	96-22-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Heptanone	123-19-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Methyl-2-pentanone	108-10-1	Subchronic	NOAEL	Rat	3.50E-01	2.50E+05	1.0E-01	1.0E+00	Liver/kidney abnormalities	2.50E+04	Microbiological Associates (1986) in Sample and others (1996)
4-Methyl-3-penten-2-one	141-79-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
5-Methyl-2-hexanone	110-12-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetaldehyde	75-07-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetamide	60-35-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetic acid	64-19-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetic acid ethyl ester	141-78-6	Subchronic	NOAEL	Rat	3.50E-01	9.00E+05	1.0E-01	1.0E+00	Mortality	9.00E+04	US EPA (1986c) in IRIS (2002)
Acetic acid n-butyl ester	123-86-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetonitrile	75-05-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acrolein	107-02-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acrylonitrile	107-13-1	Chronic	LOAEL	Rat	3.50E-01	4.60E+03	1.0E+00	1.0E-01	Lesions and organ effects	4.60E+02	Quast and others (1980) in EPA (1999)
Bis(isopropyl)ether	108-20-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Butane	106-97-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Carbon disulfide	75-15-0	Chronic	NOAEL	Rabbit	No data	1.10E+04	1.0E+00	1.0E+00	Fetal toxicity/ malformations	1.10E+04	Hardin and others (1981) in IRIS (2002)
Cyanogen	460-19-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexane	110-82-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexanone	108-94-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexene	110-83-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclopentane	287-92-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl alcohol	64-17-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl ether	60-29-7	Subchronic	NOAEL	Rat	3.50E-01	5.00E+05	1.0E-01	1.0E+00	Depressed body weights	5.00E+04	US EPA (1986d) in IRIS (2002)
Ethyl methacrylate	97-63-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formaldehyde	50-00-0	Acute	LOAEL	Rat	3.50E-01	2.30E+05	1.0E-01	1.0E-01	Mortality	2.30E+03	Tsuchiya and others (1975) in EPA (1999)
Formamide	75-12-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formic acid	64-18-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formic acid, methyl ester	107-31-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-3 Derivation of Toxicity Reference Values (TRVs) for Exposure of Mammal Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Glycidylaldehyde	765-34-4	Subchronic	NOAEL	Rat	3.50E-01	1.09E+03	1.0E-01	1.0E+00	Retardation, enlarged adrenals, hydropic renal pelvis, and hematopoietic effects	1.09E+02	Hine and others (1961) in IRIS (2002)
Methyl acetate	79-20-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl alcohol	67-56-1	Subchronic	NOAEL	Rat	3.50E-01	5.00E+05	1.0E-01	1.0E+00	Abnormal liver enzymes and decreased brain weight	5.00E+04	US EPA (1986e) in IRIS (2002)
Methyl isocyanate	624-83-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl methacrylate	80-62-6	Chronic	NOAEL	Rat	3.50E-01	1.36E+05	1.0E+00	1.0E+00	No data	1.36E+05	Borzelleca and others (1964) in IRIS (2002)
Methyl tert-butyl ether	1634-04-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylacetylene	74-99-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylcyclohexane	108-87-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N,N-Dimethylacetamide	127-19-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Butyl alcohol	71-36-3	Subchronic	NOAEL	Rat	3.50E-01	1.25E+05	1.0E-01	1.0E+00	Hypoactivity and ataxia	1.25E+04	US EPA (1986f) in IRIS (2002)
n-Heptane	142-82-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Hexane	110-54-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitromethane	75-52-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Nonane	111-84-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Octane	111-65-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Pentane	109-66-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Propionaldehyde	123-38-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Propyl alcohol	71-23-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Valeraldehyde	110-62-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Oxirane	75-21-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Cymene	99-87-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phosgene	75-44-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propargyl alcohol	107-19-7	Subchronic	NOAEL	Rat	3.50E-01	5.00E+03	1.0E-01	1.0E+00	Renal and hepatotoxicity	5.00E+02	US EPA (1987a) in IRIS (2002)
Propionic acid	79-09-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propionitrile	107-12-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propylene glycol monomethyl ether	107-98-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-tert-Butyltoluene	98-51-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Triethylamine	121-44-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trimethylamine	75-50-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Vinyl acetate	108-05-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-3 Derivation of Toxicity Reference Values (TRVs) for Exposure of Mammal Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Non-aromatic Halogenated Hydrocarbons											
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,1,2-Tetrachloroethane	630-20-6	Chronic	LOAEL	No data	No data	8.93E+04	1.0E+00	1.0E-01	Mineralization of the kidneys in males, hepatic clear cell change in females	8.93E+03	NTP (1983a) in IRIS (2002)
1,1,1-Trichloroethane	71-55-6	Chronic	NOAEL	Mouse	3.50E-02	1.00E+06	1.0E+00	1.0E+00	Impaired reproduction	1.00E+06	Lane and others (1982) in Sample and others (1996)
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,2,2-Tetrachloroethane	79-34-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,2,2-Tetrachloroethene	127-18-4	Chronic	NOAEL	Mouse	3.00E-02	1.40E+04	1.0E+00	1.0E-01	Hepatotoxicity	1.40E+03	Buben and O'Flaherty (1985) in IRIS (2002)
1,1,2-Trichloroethane	79-00-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,2-Trichloroethylene	79-01-6	Subchronic	LOAEL	Mouse	3.00E-02	1.00E+05	0.07[a]	1.0E-01	Hepatotoxicity	7.00E+02	Buben and O'Flaherty (1985) in IRIS (2002)
1,1-Dichloroethane	75-34-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1-Dichloroethene	75-35-4	Chronic	NOAEL	Rat	3.50E-01	3.00E+04	1.0E+00	1.0E+00	Mortality	3.00E+04	Quast and others (1983) in Sample and others (1996)
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3-Trichloropropane	96-18-4	Subchronic	NOAEL	Rat	3.50E-01	5.71E+03	1.0E-01	1.0E+00	Alterations in clinical chemistry and reduction in red cell mass	5.71E+02	NTP (1983b) in IRIS (2002)
1,2-Dibromo-3-chloropropane	96-12-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichloroethane	107-06-2	Chronic	NOAEL	Mouse	3.50E-02	5.00E+04	1.0E+00	1.0E+00	Impaired reproduction	5.00E+04	Lane and others (1982) in Sample and others (1996)]
1,2-Dichloroethylene	540-59-0	Subchronic	NOAEL	Mouse	3.00E-02	4.52E+05	1.0E-01	1.0E+00	Reduced body weight	4.52E+04	Palmer and others (1979) in Sample and others (1996)
1,2-Dichloropropane	78-87-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Dichloropropene	542-75-6	Chronic	NOAEL	Rat	3.50E-01	2.50E+03	1.0E+00	1.0E+00	Stomach lesions	2.50E+03	Stott and others (1995) in IRIS (2002)
1,4-Dichloro-2-butene	764-41-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1-Chloroethene	75-01-4	Chronic	NOAEL	Rat	3.50E-01	1.70E+03	1.0E+00	1.0E-01	No data	1.70E+02	Feron and others (1981) in EPA (1999)
2,2-Dichloropropionic acid	75-99-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chloropropane	75-29-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Chloropropene (Allyl chloride)	107-05-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromochloromethane	74-97-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromodichloromethane	75-27-4	Chronic	LOAEL	Mouse	3.00E-02	1.79E+04	1.0E+00	1.0E-01	Renal cytomegaly	1.79E+03	NTP (1986) in IRIS (2002)
Bromoethene	593-60-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromoform	75-25-2	Subchronic	NOAEL	Rat	3.50E-01	1.79E+04	1.0E-01	1.0E+00	Hepatic lesions	1.79E+03	NTP (1989) in IRIS (2002)
Bromomethane	74-83-9	Subchronic	NOAEL	Rat	3.50E-01	1.40E+03	1.0E-01	1.0E+00	Epithelial hyperplasia of the forestomach	1.40E+02	Danse and others (1984) in IRIS (2002)

Table C3-3 Derivation of Toxicity Reference Values (TRVs) for Exposure of Mammal Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Carbon tetrachloride	56-23-5	Subchronic	NOAEL	Rat	3.50E-01	7.10E+02	1.0E-01	1.0E+00	Liver lesions	7.10E+01	Bruckner and others (1986) in IRIS (2002)
Chlorodibromomethane	124-48-1	Subchronic	NOAEL	Rat	3.50E-01	2.14E+04	1.0E-01	1.0E+00	Hepatic lesions	2.14E+03	NTP (1985a) in IRIS (2002)
Chlorodifluoromethane	75-45-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloroethane	75-00-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloroform	67-66-3	Chronic	NOAEL	Mouse	3.00E-02	6.00E+04	1.0E+00	1.0E+00	Liver degeneration	6.00E+04	Roe and others (1979) in EPA (1999)
Chloromethane	74-87-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloropentafluoroethane	76-15-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
cis-1,2-Dichloroethene	156-59-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
cis-1,3-Dichloropropene	10061-01-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyanogen bromide	506-68-3	Chronic	NOAEL	Rat	3.50E-01	4.40E+04	1.0E+00	1.0E-01	Thyroid effects and myelin degeneration	4.40E+03	Howard and Hanzal (1955) in IRIS (2002)[a]
Cyanogen chloride	506-77-4	Chronic	NOAEL	Rat	3.50E-01	2.53E+04	1.0E+00	1.0E-01	Thyroid effects and myelin degeneration	2.53E+03	Howard and Hanzal (1955) in IRIS (2002)[a]
Dichlorodifluoromethane	75-71-8	Chronic	NOAEL	Rat	3.50E-01	1.50E+04	1.0E+00	1.0E+00	Reduced body weight	1.50E+04	Sherman (1974) in IRIS (2002)
Dichlorofluoromethane	75-43-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloromethane	75-09-2	Chronic	NOAEL	Rat	3.50E-01	6.16E+03	1.0E+00	1.0E+00	Liver toxicity	6.16E+03	National Coffee Association (1982) in IRIS (2002)
Difluorodibromomethane	75-61-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexafluoroacetone	684-16-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Iodomethane	74-88-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylene bromide	74-95-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachloroethane	76-01-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
trans-1,2-Dichloroethylene	156-60-5	Chronic	NOAEL	Mouse	3.00E-02	1.70E+04	1.0E+00	1.0E-01	Increased serum alkaline phosphatase in male mice	1.70E+03	Barnes and others (1985) in IRIS (2002)
trans-1,3-Dichloropropene	10061-02-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichloroacetic acid	76-03-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichlorofluoroethane	27154-33-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichlorofluoromethane	75-69-4	Chronic	LOAEL	Rat	3.50E-01	3.49E+05	1.0E+00	1.0E-01	Survival and histopathology	3.49E+04	NCI (1978) in IRIS (2002)
Trifluorobromomethane	75-63-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dioxin and Furan Compounds (PCDDs/PCDFs)											
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	Subchronic	NOAEL	Rat	3.50E-01	1.60E+00	1.0E-01	1.0E+00	Abnormal organ weight	1.60E-01	Poiger and others (1989) in Sample and others (1996)
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-3 Derivation of Toxicity Reference Values (TRVs) for Exposure of Mammal Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	Subchronic	NOAEL	Rat	3.50E-01	1.60E+00	1.0E-01	1.0E+00	Abnormal organ weight	1.60E-01	Poiger and others (1989) in Sample and others (1996)
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	Subchronic	NOAEL	Rat	3.50E-01	1.60E-01	1.0E-01	1.0E+00	Abnormal organ weight	1.60E-02	Poiger and others (1989) in Sample and others (1996)
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	Chronic	NOAEL	Rat	3.50E-01	1.00E-03	1.0E+00	1.0E+00	Impaired reproduction	1.00E-03	Murray and others (1979) in Sample and others (1996)
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzofuran	132-64-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Octachlorodibenzo(p)dioxin	3268-87-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Octachlorodibenzofuran	39001-02-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Total dioxins and dibenzofurans	No CAS#	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Polychlorinated Biphenyls (PCBs)											
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Polychlorinated biphenyls (PCBs)[b]	1336-36-3	Subchronic	LOAEL	Mink	1.00E+00	2.06E+01	1.0E-01	1.0E-01	Mortality	2.06E-01	Aulerich and others (1985) in EPA (1999)
Phthalates											
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	Chronic	NOAEL	Rat	3.50E-01	6.00E+04	1.0E+00	1.0E+00	Reduced growth rate, abnormal organ weight	6.00E+04	Carpenter and others (1953) in EPA (1999)
Butylbenzyl phthalate	85-68-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibutyl phthalate	84-74-2	Chronic	NOAEL	Mouse	3.00E-02	5.50E+05	1.0E+00	1.0E+00	Impaired reproduction	5.50E+05	Lamb and others (1987) in Sample and others (1996)
Diethyl phthalate	84-66-2	Chronic	NOAEL	Mouse	3.00E-02	4.58E+06	1.0E+00	1.0E+00	Impaired reproduction	4.58E+06	Lamb and others (1987) in Sample and others (1996)
Dimethyl phthalate	131-11-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Dioctyl phthalate	117-84-0	Chronic	NOAEL	Mouse	3.00E-02	7.50E+06	1.0E+00	1.0E+00	No data	7.50E+06	Heindel and others (1989) in EPA (1999)
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)											

Table C3-3 Derivation of Toxicity Reference Values (TRVs) for Exposure of Mammal Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
2-Chloronaphthalene	91-58-7	Chronic	NOAEL	Mouse	3.00E-02	2.50E+05	1.0E+00	1.0E+00	Dyspnea, abnormal appearance, liver enlargement	2.50E+05	US EPA (1989a) in IRIS (2002)
2-Methyl naphthalene	91-57-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
5-Nitroacenaphthene	602-87-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acenaphthene	83-32-9	Subchronic	NOAEL	Mouse	3.00E-02	1.75E+05	1.0E-01	1.0E+00	Hepatotoxicity	1.75E+04	US EPA (1989b) in IRIS (2002)
Acenaphthylene	208-96-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Anthracene	120-12-7	Subchronic	NOAEL	Mouse	3.00E-02	1.00E+06	1.0E-01	1.0E+00	No data	1.00E+05	US EPA (1989c) in IRIS (2002)
Fluorene	86-73-7	Subchronic	NOAEL	No data	No data	1.25E+05	1.0E-01	1.0E+00	Blood abnormalities	1.25E+04	US EPA (1989d) in IRIS (2002)
Indene	95-13-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Naphthalene	91-20-3	Subchronic	NOAEL	No data	No data	7.10E+04	1.0E-01	1.0E+00	Decreased body weights in males	7.10E+03	BCL (1980) in IRIS (2002)
Phenanthrene	85-01-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pyrene	129-00-0	Subchronic	NOAEL	No data	No data	7.50E+04	1.0E-01	1.0E+00	Kidney effects	7.50E+03	US EPA (1989e) in IRIS (2002)
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)											
3-Methylcholanthrene	56-49-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
5-Methylchrysene	3697-24-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[a]anthracene	56-55-3	Acute	LOAEL	Mouse	3.00E-02	1.67E+04	1.0E-01	1.0E-01	Gastrointestinal effects	1.67E+02	Bock and King (1959) in EPA (1999)
Benzo[a]pyrene	50-32-8	Chronic	LOAEL	Mouse	3.00E-02	1.00E+04	1.0E-01	1.0E-01	Impaired reproduction	1.00E+02	Mackenzie and Angevine (1981) in EPA (1999a)
Benzo[a,e]pyrene	191-30-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[b]fluoranthene	205-99-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[e]pyrene	192-97-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[g,h,i]perylene	191-24-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[j]fluoranthene	205-82-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[k]fluoranthene	207-08-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chrysene	218-01-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenz[a,h]acridine	226-36-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenz[a,h]anthracene	53-70-3	Subchronic	LOAEL	Rat	3.50E-01	2.00E+02	1.0E-01	1.0E-01	Reduced growth rate	2.00E+00	Haddow and others (1937) in EPA (1999)
Dibenz[a,j]acridine	224-42-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,e]fluoranthene	5385-75-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,e]pyrene	192-65-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,h]fluoranthene	No CAS#	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,h]pyrene	189-64-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,i]pyrene	189-55-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Fluoranthene	206-44-0	Subchronic	NOAEL	Mouse	3.00E-02	1.25E+05	1.0E-01	1.0E+00	Nephropathy, hematological alterations, and clinical effects	1.25E+04	US EPA (1988a) in IRIS (2002)

Table C3-3 Derivation of Toxicity Reference Values (TRVs) for Exposure of Mammal Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Hexachloronaphthalene	1335-87-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Indeno[1,2,3-cd]pyrene	193-39-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Octachloronaphthalene	2234-13-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachloronaphthalene	1321-64-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tetrachloronaphthalene	1335-88-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichloronaphthalene	1321-65-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Light Substituted Benzene Compounds (molecular weight <200 g/mole)											
1,2,3-Trichlorobenzene	87-61-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,4-Trichlorobenzene	120-82-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,4-Trimethyl benzene	95-63-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichlorobenzene	95-50-1	Chronic	NOAEL	Rat	3.50E-01	8.57E+04	1.0E+00	1.0E+00	No adverse effects observed	8.57E+04	NTP (1985b) in IRIS (2002)
1,3,5-Trimethyl benzene	108-67-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Dichlorobenzene	541-73-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Dinitrobenzene	99-65-0	Chronic	NOAEL	Rat	3.50E-01	1.05E+03	1.0E+00	1.0E+00	Impaired reproduction	1.05E+03	Cody and others (1981) in EPA (1999)
1,4-Dichlorobenzene	106-46-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,4-Dinitrobenzene	100-25-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4,5-Trichlorophenol	95-95-4	Subchronic	NOAEL	Rat	3.50E-01	1.00E+05	1.0E-01	1.0E+00	Liver and kidney pathology	1.00E+04	McCollister and others (1961) in IRIS (2002)
2,4,6-Trichlorophenol	88-06-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-Dichlorophenol	120-83-2	Subchronic	NOAEL	Rat	3.50E-01	3.00E+02	1.0E-01	1.0E+00	Decreased delayed hypersensitivity response	3.00E+01	Exon and Koller (1985) in IRIS (2002)
2,4-Dimethylphenol	105-67-9	Subchronic	NOAEL	Mouse	3.00E-02	5.00E+04	1.0E-01	1.0E+00	Lethargy, prostration, and ataxia	5.00E+03	US EPA (1989f) in IRIS (2002)
2,4-Dinitrophenol	51-28-5	Chronic	LOAEL	Human	7.00E+01	2.00E+03	1.0E+00	1.0E-01	Cataract formation	2.00E+02	Horner (1942) in IRIS (2002)
2,4-Dinitrotoluene	121-14-2	Chronic	NOAEL	Dog	No data	3.50E+04	1.0E+00	1.0E+00	Impaired reproduction	3.50E+04	Ellis and others (1979) in EPA (1999)
2,6-Dinitrotoluene	606-20-2	Acute	LOAEL	Dog	No data	4.00E+03	1.0E-01	1.0E-01	Mortality	4.00E+01	Lee and others (1976) in EPA (1999)
2-Chlorophenol	95-57-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chlorotoluene	95-49-8	Chronic	NOAEL	Rat	3.50E-01	2.00E+04	1.0E+00	1.0E+00	Decrease in body weight gain	2.00E+04	Gibson and others (1974) in IRIS (2002)
2-Nitrophenol	88-75-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,6-Dinitro-o-cresol	534-52-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Chlorotoluene	106-43-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Nitrophenol	100-02-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
alpha-Methylstyrene	98-83-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Aniline	62-53-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzotrichloride	98-07-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzyl chloride	100-44-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromobenzene	108-86-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-3 Derivation of Toxicity Reference Values (TRVs) for Exposure of Mammal Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Chlorobenzene	108-90-7	Chronic	NOAEL	Dog	1.00E+01	1.90E+04	1.0E+00	1.0E+00	Histopathologic changes in liver	1.90E+04	Monsanto Co. (1967); Knapp and others (1971) in IRIS (2002)
Cumene	98-82-8	Chronic	NOAEL	Rat	3.50E-01	1.10E+05	1.0E+00	1.0E+00	Increased average kidney weight in females	1.10E+05	Wolf and others (1956) in IRIS (2002)
m-Cresol	108-39-4	Subchronic	NOAEL	Rat	3.50E-01	5.00E+04	1.0E-01	1.0E+00	Decreased body weights and neurotoxicity	5.00E+03	US EPA (1986g, 1987b) in IRIS (2002)
n-Butyl benzene	104-51-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrobenzene	98-95-3	Subchronic	LOAEL	Rat/Mouse	3.50E-01	4.60E+03	1.0E-01	1.0E-01	Hematologic, adrenal, renal and hepatic lesions	4.60E+01	CIIT (1984) in IRIS (2002)
n-Propyl benzene	103-65-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Cresol	95-48-7	Subchronic	NOAEL	Rat	3.50E-01	5.00E+04	1.0E-01	1.0E+00	Decreased body weights and neurotoxicity	5.00E+03	US EPA (1986g, 1987b) in IRIS (2002)
o-Dinitrobenzene	528-29-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Nitroaniline	88-74-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Toluidine	95-53-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Chloroaniline	106-47-8	Chronic	LOAEL	Rat	3.50E-01	1.25E+04	1.0E+00	1.0E-01	Nonneoplastic lesions of splenic capsule	1.25E+03	NCI (1979a) in IRIS (2002)
p-Cresol	106-44-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phenol	108-95-2	Chronic	NOAEL	Rat	3.50E-01	6.00E+04	1.0E+00	1.0E+00	Reduced fetal body weight	6.00E+04	NTP (1983c) in IRIS (2002)
p-Nitrochlorobenzene	100-00-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Toluidine	106-49-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
sec-Butyl benzene	135-98-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
tert-Butyl benzene	98-06-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Toluene-2,6-diamine	823-40-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trimethyl benzene	25551-13-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Other Light Semivolatile Compounds (molecular weight <200 g/mole)											
1,1'-Biphenyl	92-52-4	Chronic	NOAEL	Rat	3.50E-01	5.00E+04	1.0E+00	1.0E+00	Kidney damage	5.00E+04	Ambrose and others (1960) in IRIS (2002)
1,1-Dimethylhydrazine	57-14-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dimethylhydrazine	540-73-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Diphenylhydrazine	122-66-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Propane sultone	1120-71-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-Toluene diisocyanate	584-84-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chloroacetophenone	532-27-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Propenoic acid	79-10-7	Chronic	NOAEL	Rat	3.50E-01	5.30E+04	1.0E+00	1.0E-01	Reduced pup weight	5.30E+03	BASF (1993) in IRIS (2002)
4,4'-Methylenedianiline	101-77-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetophenone	98-86-2	Subchronic	NOAEL	Rat	3.50E-01	4.23E+05	1.0E-01	1.0E+00	General toxicity	4.23E+04	Hagen and others (1967) in IRIS (2002)

Table C3-3 Derivation of Toxicity Reference Values (TRVs) for Exposure of Mammal Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Benzoic acid	65-85-0	Chronic	LOAEL	Mouse	3.00E-02	4.00E+04	1.0E+00	1.0E-01	Unknown	4.00E+03	Shtenberg and Ignat'ev (1970) in IRIS (2002)
Bis(2-chloroethoxy)methane	111-91-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bis(2-chloroethyl) ether	111-44-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorocyclopentadiene	41851-50-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexanol	108-93-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloroisopropyl ether	108-60-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloromethyl ether	542-88-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloropentadiene	61626-71-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dimethyl sulfate	77-78-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dimethylaniline	121-69-7	Subchronic	LOAEL	Mouse	3.00E-02	2.23E+04	1.0E-01	1.0E-01	Splenomegaly and hematopoiesis	2.23E+02	Abdo and others (1984b) in IRIS (2002)
di-n-Propylnitrosamine	621-64-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Diphenyl ether	101-84-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Epichlorohydrin	106-89-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl Carbamate (Urethane)	51-79-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl methanesulfonate	62-50-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene dibromide	106-93-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene glycol	107-21-1	Chronic	NOAEL	Rat	3.50E-01	2.00E+05	1.0E+00	1.0E-01	Kidney toxicity	2.00E+04	DePass and others (1986) in IRIS (2002)
Ethylene glycol monobutyl ether	111-76-2	Subchronic	NOAEL	Rat/Mouse	3.50E-01	5.10E+03	1.0E-01	1.0E+00	Changes in mean corpuscular volume	5.10E+02	NTP (1993) in IRIS (2002)
Ethylene glycol monoethyl ether acetate	111-15-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene thiourea	96-45-7	Chronic	LOAEL	Rat	3.50E-01	2.50E+02	1.0E+00	1.0E-01	Increased incidence of thyroid hyperplasia	2.50E+01	Graham and others (1975) in IRIS (2002)
Furfural	98-01-1	Subchronic	LOAEL	Rat	3.50E-01	7.90E+03	1.0E-01	1.0E-01	Mild hepatocellular vacuolization	7.90E+01	NTP (1981) in IRIS (2002)
Maleic hydrazide	123-33-1	Chronic	LOAEL	Rat	3.50E-01	5.00E+05	1.0E+00	1.0E-01	Renal dysfunction	5.00E+04	Uniroyal Chemical Co. (1981) in IRIS (2002)
Malononitrile	109-77-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl styrene (mixed isomers)	25013-15-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylhydrazine	60-34-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N,N-Diphenylamine	122-39-4	Chronic	NOAEL	Dog	1.00E+01	2.50E+03	1.0E+00	1.0E-01	Increased liver and kidney weights	2.50E+02	Thomas and others (1967) in IRIS (2002)
Nitric acid, propyl ester	627-13-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N-Nitrosodi-n-butylamine	924-16-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N-Nitrosomorpholine	59-89-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N-Nitroso-N,N-dimethylamine	62-75-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Anisidine	90-04-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Oxalic acid	144-62-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phthalic anhydride	85-44-9	Chronic	LOAEL	Mouse	3.00E-02	1.56E+06	1.0E+00	1.0E-01	Lung and kidney histopathology	1.56E+05	NCI (1979b) in IRIS (2002)
p-Phthalic acid	100-21-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-3 Derivation of Toxicity Reference Values (TRVs) for Exposure of Mammal Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Pyridine	110-86-1	Chronic	NOAEL	Rat	3.50E-01	1.00E+03	1.0E+00	1.0E-01	Increased liver weight	1.00E+02	US EPA (1986h) in IRIS (2002)
Quinoline	91-22-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Quinone	106-51-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Safrole	94-59-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tetrahydrofuran	109-99-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)											
1,2,4,5-Tetrachlorobenzene	95-94-3	Subchronic	NOAEL	Rat	3.50E-01	3.40E+02	1.0E-01	1.0E+00	Kidney lesions	3.40E+01	Chu and others (1984) in IRIS (2002)
1,3,5-Trinitrobenzene	99-35-4	Chronic	NOAEL	Rat	3.50E-01	2.68E+03	1.0E+00	1.0E+00	Abnormal hematology	2.68E+03	Reddy and others (1997) in IRIS (2002)
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	Subchronic	LOAEL	Human	7.00E+01	2.00E+03	1.0E-01	1.0E-01	Cataract formation	2.00E+01	Horner (1942) in IRIS (2002)
2-sec-Butyl-4,6-dinitrophenol	88-85-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3'-Dichlorobenzidine	91-94-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3'-Dimethoxybenzidine	119-90-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Bromophenylphenyl ether	101-55-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ammonium perfluorooctanoate	3825-26-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Azobenzene	103-33-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	96-69-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Captan	133-06-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorobenzilate	510-15-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibutylphosphate	107-66-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dimethyl aminoazobenzene	60-11-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexachlorobenzene	118-74-1	Chronic	NOAEL	Rat	3.50E-01	1.60E+03	1.0E+00	1.0E+00	No data	1.60E+03	Grant and others (1977) in EPA (1999)
Hexachlorobutadiene	87-68-3	Chronic	NOAEL	Rat	3.50E-01	2.00E+02	1.0E+00	1.0E+00	Kidney neoplasms	2.00E+02	Kociba and others (1977) in EPA (1999)
Hexachlorocyclopentadiene	77-47-4	Subchronic	NOAEL	Rat	3.50E-01	3.80E+04	1.0E-01	1.0E+00	Stomach lesions	3.80E+03	Abdo and others (1984a) in EPA (1999)
Hexachloroethane	67-72-1	Subchronic	NOAEL	Rat	3.50E-01	1.00E+03	1.0E-01	1.0E+00	Atrophy and degeneration of renal tubules	1.00E+02	Gorzinski and others (1985) in IRIS (2002)
Hexachlorophene	70-30-4	Acute	LD50	Rat	3.50E-01	5.60E+05	1.0E-01	1.0E-01	Mortality	5.60E+03	Meister (1994) in EPA (1999)
Hexamethylene-1,5-diisocyanate	822-06-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Mirex	2385-85-5	Chronic	NOAEL	Rat	3.50E-01	7.00E+01	1.0E+00	1.0E+00	Liver cytomegaly	7.00E+01	NTP (1990) in IRIS (2002)
Nitrofen	1836-75-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachlorobenzene	608-93-5	Chronic	NOAEL	Rat	3.50E-01	7.25E+03	1.0E+00	1.0E+00	Abnormal organ weight	7.25E+03	Linder and others (1980) in EPA (1999)
Pentachloronitrobenzene	82-68-8	Chronic	NOAEL	Mouse	3.00E-02	4.58E+05	1.0E+00	1.0E+00	No data	4.58E+05	National Toxiciolgy Program (1987) in EPA (1999)
Pentachlorophenol	87-86-5	Subchronic	NOAEL	Rat	3.50E-01	3.00E+03	1.0E-01	1.0E+00	Impaired reproduction	3.00E+02	Schwetz and others (1978) in EPA (1999)
Picric acid	88-89-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-3 Derivation of Toxicity Reference Values (TRVs) for Exposure of Mammal Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Pronamide	23950-58-5	Chronic	NOAEL	Dog	1.00E+01	7.50E+03	1.0E+00	1.0E-01	No effects	7.50E+02	Rohm & Hass, Co. (1970) in IRIS (2002)
Strychnine	57-24-9	Subchronic	LOAEL	Rat	3.50E-01	2.50E+03	1.0E-01	1.0E-01	Toxicity/ histopathology	2.50E+01	Seidl and Zbinden (1982) in IRIS (2002)
Terphenyls	26140-60-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tributyl phosphate	126-73-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trifluralin	1582-09-8	Chronic	NOAEL	Dog	1.00E+01	7.50E+02	1.0E-01	1.0E+00	Increased liver weights	7.50E+01	Hoechst Aktiengesellschaft (1984) in IRIS (2002)
Triphenylamine	603-34-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Herbicides and Organochlorinated Pesticides											
2,4,5-T	93-76-5	Chronic	NOAEL	Rat	3.50E-01	3.00E+03	1.0E+00	1.0E+00	Increased urinary coproporphyrins	3.00E+03	Smith and others (1981) in IRIS (2002)
2,4-D and esters	94-75-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,4'-DDD	72-54-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,4'-DDE	72-55-9	Subchronic	NOAEL	Rat	3.50E-01	1.00E+04	1.0E-01	1.0E+00	No data	1.00E+03	Kornburst and others (1986) in EPA (1999)
4,4'-DDT	50-29-3	Chronic	NOAEL	Rat	3.50E-01	8.00E+02	1.0E+00	1.0E+00	Impaired reproduction	8.00E+02	Fitzhugh (1948) in Sample and others (1996)
Aldrin	309-00-2	Chronic	NOAEL	Rat	3.50E-01	2.00E+02	1.0E+00	1.0E+00	Impaired reproduction	2.00E+02	Treon and Cleveland (1955) in Sample and others (1996)
alpha-BHC	319-84-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
beta-BHC	319-85-7	Subchronic	NOAEL	Rat	3.50E-01	4.00E+00	1.0E-01	1.0E+00	Reduced growth	4.00E-01	Van Velsen and others (1986) in Sample and others (1996)
Chlordane	57-74-9	Chronic	NOAEL	Mouse	3.00E-02	4.58E+03	1.0E+00	1.0E+00	Impaired reproduction	4.58E+03	Keplinger and others (1968) in Sample and others (1996)
delta-BHC	319-86-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dieldrin	60-57-1	Chronic	Loael	Rat	3.50E-01	2.00E+02	1.0E+00	1.0E-01	Impaired reproduction	2.00E+01	Treon and Cleveland (1955) in Sample and others (1996)
Endothall	145-73-3	Chronic	NOAEL	Dog	1.00E+01	2.00E+03	1.0E+00	1.0E+00	Increased weight of stomach and small intestine	2.00E+03	Pennwalt Agchem. (1965) in IRIS (2002)
Endrin	72-20-8	Chronic	LOAEL	Mouse	3.00E-02	9.20E+02	1.0E+00	1.0E-01	Impaired reproduction	9.20E+01	Good and Ware (1969) in Sample and others (1996)
gamma-BHC (Lindane)	58-89-9	Chronic	NOAEL	Rat	3.50E-01	8.00E+03	1.0E+00	1.0E+00	Impaired reproduction	8.00E+03	Palmer and others (1978) in Sample and others (1996)
Heptachlor	76-44-8	Subchronic	LOAEL	Rat	3.50E-01	2.50E+02	1.0E-01	1.0E-01	Mortality	2.50E+00	Green (1970) in EPA (1999)
Isodrin	465-73-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methoxychlor	72-43-5	Chronic	NOAEL	No data	No data	5.01E+03	1.0E+00	1.0E+00	Excessive loss of litters	5.01E+03	Kincaid Enterprises (1986) in IRIS (2002)
Silvex (2,4,5-TP)	93-72-1	Chronic	NOAEL	Dog	1.00E+01	7.50E+02	1.0E+00	1.0E+00	Liver abnormalities	7.50E+02	Mullison (1966), Gehring and Betso (1978) in IRIS (2002)

Table C3-3 Derivation of Toxicity Reference Values (TRVs) for Exposure of Mammal Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Toxaphene	8001-35-2	Chronic	NOAEL	Rat	3.50E-01	8.00E+03	1.0E+00	1.0E+00	Impaired reproduction	8.00E+03	Kennedy and others (1973) in Sample and others (1996)
Inorganic Chemicals and Compounds						(mg/kgBW/d)				(mg/kgBW/d)	
	Metals										
Aluminum	7429-90-5	Chronic	LOAEL	Rat	3.50E-01	1.93E+01	1.0E+00	1.0E-01	Reduced growth	1.93E+00	Ondreicka and others (1966) in EPA (1999)
Antimony	7440-36-0	Chronic	LOAEL	Rat	3.50E-01	6.60E-01	1.0E+00	1.0E-01	Mortality	6.60E-02	Schroeder and others (1970) in EPA (1999)
Arsenic	7440-38-2	Chronic	NOAEL	Dog	No data	1.25E+00	1.0E+00	1.0E+00	Impaired reproduction	1.25E+00	Byron and others (1967) in EPA (1999)
Barium	7440-39-3	Chronic	NOAEL	Rat	4.35E-01	5.10E-01	1.0E+00	1.0E+00	Reduced growth	5.10E-01	Perry and others (1983) in EPA (1999)
Beryllium	7440-41-7	Chronic	NOAEL	Rat	3.50E-01	6.60E-01	1.0E+00	1.0E+00	Reduced longevity	6.60E-01	Schroeder and Mitchner (1975) in EPA (1999)
Bismuth	7440-69-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Boron	7440-42-8	Chronic	NOAEL	Rat	3.50E-01	2.80E+01	1.0E+00	1.0E+00	Impaired reproduction	2.80E+01	Weir and Fisher (1972) in Sample and others (1996)
Cadmium	7440-43-9	Chronic	LOAEL	Mouse	3.00E-02	2.52E+00	1.0E+00	1.0E-02	Impaired reproduction	2.52E-02	Schroeder and Mitchner (1971) in EPA (1999)
Calcium	7440-70-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chromium[e]	18540-29-9	Chronic	NOAEL	Rat	3.50E-01	3.50E+00	1.0E+00	1.0E+00	No data	3.50E+00	MacKenzie and others (1958) in EPA (1999)
Cobalt	7440-48-4	Subchronic	NOAEL	Rat	3.50E-01	2.86E+00	1.0E-01	1.0E+00	Mortality	2.86E-01	Underhill and others (1931) in Clayton and Clayton (1981)
Copper	7440-50-8	Chronic	NOAEL	Mink	1.00E+00	1.20E+01	1.0E+00	1.0E+00	Impaired reproduction	1.20E+01	Aulerich and others (1982) in EPA (1999)
Iron	7439-89-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Lead	7439-92-1	Chronic	LOAEL	Rat	3.50E-01	3.75E+00	1.0E+00	1.0E-02	Mortality	3.75E-02	Schroeder and Mitchner (1971) in EPA (1999)
Lithium	7439-93-2	Chronic	NOAEL	Rat	3.50E-01	9.39E+00	1.0E+00	1.0E+00	Impaired reproduction	9.39E+00	Marathe and Thomas (1986) in Sample and others (1996)
Magnesium	7439-95-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Manganese	7439-96-5	Chronic	NOAEL	Rat	3.50E-01	8.80E+01	1.0E+00	1.0E+00	Impaired reproduction	8.80E+01	Laskey and others (1982) in Sample and others (1996)
Mercury	7439-97-6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury - Hg+2	7487-94-7	Chronic	NOAEL	Mink	1.00E+00	1.01E+00	1.0E+00	1.0E+00	Impaired reproduction	1.01E+00	Aulerich and others (1974) in EPA (1999)
Methylmercury	22967-92-6	Subchronic	NOAEL	Rat	3.50E-01	3.20E-02	1.0E+00	1.0E+00	Impaired reproduction	3.20E-02	Verschuuren and others (1976a, 1976b) in EPA (1999)
Molybdenum	7439-98-7	Chronic	LOAEL	Mouse	3.00E-02	2.58E+00	1.0E+00	1.0E-01	Impaired reproduction	2.58E-01	Schroeder and Mitchner (1971) in Sample and others (1996)

Table C3-3 Derivation of Toxicity Reference Values (TRVs) for Exposure of Mammal Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Nickel	7440-02-0	Chronic	NOAEL	Rat	3.50E-01	5.00E+01	1.0E+00	1.0E+00	Impaired reproduction	5.00E+01	Ambrose and others (1976) in EPA (1999)
Potassium	7440-09-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Rhodium	7440-16-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Selenium	7782-49-2	Chronic	LOAEL	Mouse	3.00E-02	7.60E-01	1.0E+00	1.0E-01	Mortality	7.60E-02	Schroeder and Mitchner (1971) in EPA (1999)
Silicon	7440-21-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Silver	7440-22-4	Chronic	LOAEL	Mouse	3.00E-02	3.75E+00	1.0E+00	1.0E-01	Hypoactivity	3.75E-01	Rungby and Danscher (1984) in EPA (1999)
Sodium	7440-23-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Strontium	7440-24-6	Chronic	NOAEL	Rat	3.50E-01	2.63E+02	1.0E+00	1.0E+00	Reduced body weight	2.63E+02	Skoryna (1981) in Sample and others (1996)
Tantalum	7440-25-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Thallium	7440-28-0	Subchronic	LOAEL	Rat	3.65E-01	1.31E+00	1.0E-01	1.0E-01	Impaired reproduction	1.31E-02	Formigli and others (1986) in EPA (1999)
Tin	7440-31-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tungsten	7440-33-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Uranium	7440-61-1	Chronic	NOAEL	Mouse	3.00E-02	3.07E+00	1.0E+00	1.0E+00	Impaired reproduction	3.07E+00	Paternain and others (1989) in Sample and others (1996)
Vanadium	7440-62-2	Chronic	LOAEL	Rat	2.60E-01	2.10E+00	1.0E+00	1.0E-01	Impaired reproduction	2.10E-01	Domingo and others (1986) in Sample and others (1996)
Yttrium	7440-65-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Zinc	7440-66-6	Subchronic	NOAEL	Mouse	3.00E-02	1.04E+02	1.0E-01	1.0E+00	No data	1.04E+01	Maita and others (1981) in EPA (1999)
Zirconium	7440-67-7	Chronic	NOAEL	Mouse	3.00E-02	1.74E+00	1.0E+00	1.0E+00	No adverse effects observed	1.74E+00	Schroeder and others (1968) in Sample and others (1996)
Non-metals and Anions											
Ammonia/Ammonium	7664-41-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromide	24959-67-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloride	16887-00-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyanide	57-12-5	Chronic	NOAEL	Rat	3.50E-01	2.40E+01	1.0E+00	1.0E+00	No data	2.40E+01	Howard and Hanzal (1955) in EPA (1999)
Fluoride	16984-48-8	Chronic	NOAEL	Mink	1.00E+00	3.14E+01	1.0E+00	1.0E+00	Impaired reproduction	3.14E+01	Aulerich and others (1987) in Sample and others (1996)
Hydroxide	14280-30-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Iodine	7553-56-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrate	14797-55-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrite	14797-65-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phosphate	14265-44-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phosphorus	7723-14-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Sulfate	14808-79-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Total Sulfur	63705-05-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Criteria Pollutants											
Carbon monoxide	630-08-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrogen dioxide	10102-44-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-3 Derivation of Toxicity Reference Values (TRVs) for Exposure of Mammal Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Ozone	10028-15-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Particulate matter	No CAS#	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Sulfur dioxide	7446-09-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Radionuclides											
All radionuclides combined (rad/d)[d]	No CAS #	Chronic	Adverse effects	Mammals	NA	NA	NA	NA	Population effects	1.00E-01	IAEA (1992)

Notes/Sources

No data = No data available.
NA = Not applicable.
CAS = Chemical Abstracts Service.
ED = Dose that caused the reported effect.
DCF = Duration conversion factor; 1 if chronic, 0.1 if subchronic (Sample and others 1996) or inferred from information presented in EPA (1999) Table E-7.
ECF = Endpoint conversion factor; 1 if NOAEL, 0.1 if LOAEL (Sample and others 1996) or inferred from information presented in EPA (1999) Table E-7.
TRV = Toxicity reference value.
LOAEL = Lowest observed adverse effect level.
NOAEL = No observed adverse effect level.

[a] Subchronic-to-chronic conversion factor of 0.1 multiplied by 0.7 to adjust for 5 d/wk exposure.

[b] Data for Aroclor-1254 used as representative of polychlorinated biphenyl mixtures.

[c] Values for hexavalent chromium, which is more toxic than trivalent chromium.

[d] TRV is not applicable to single radionuclides. Combined external and internal radiation exposure for mammals from all radionuclides combined cannot exceed 0.1 rad/d.

Table C3-4 Derivation of Toxicity Reference Values (TRVs) for Exposure of Bird Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Organic Compounds						(µg/kgBW/d)				(µg/kgBW/d)	
	Aromatic Halogenated Hydrocarbons										
2,3,4,6-Tetrachlorophenol	58-90-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Chloro-3-methylphenol	59-50-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
	Aromatic Nonhalogenated Hydrocarbons										
2-Nitrotoluene	88-72-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Nitrobiphenyl	92-93-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzaldehyde	100-52-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzene	71-43-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzyl alcohol	100-51-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl benzene	100-41-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
m-Xylene	108-38-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Xylene	95-47-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Xylene	106-42-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Styrene	100-42-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Toluene	108-88-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
	Non-aromatic Nonhalogenated Hydrocarbons										
1,2-Epoxybutane	106-88-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Butadiene	106-99-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,4-Dioxane	123-91-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1-Methylpropyl alcohol	78-92-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1-Nitropropane	108-03-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,2,4-Trimethylpentane	540-84-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Butanone	78-93-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Butenaldehyde (2-Butenal)	4170-30-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Ethoxyethanol	110-80-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Heptanone	110-43-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Hexanone	591-78-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methoxyethanol	109-86-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methyl-2-propanol	75-65-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methyl-2-propenenitrile	126-98-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methylaziridine	75-55-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methylpropyl alcohol	78-83-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Pentanone	107-87-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Propanone (Acetone)	67-64-1	Acute	No data	Japanese quail	No data	5.20E+06	1.0E-02	1.0E+00	No data	5.20E+04	Hill and Camardese (1986) in EPA (1999)
2-Propene-1-ol	107-18-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Propyl alcohol	67-63-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Heptanone	106-35-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Methyl-1-butanol	123-51-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Methyl-2-butanone	563-80-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Pentanone	96-22-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Heptanone	123-19-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Methyl-2-pentanone	108-10-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-4 Derivation of Toxicity Reference Values (TRVs) for Exposure of Bird Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
4-Methyl-3-penten-2-one	141-79-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
5-Methyl-2-hexanone	110-12-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetaldehyde	75-07-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetamide	60-35-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetic acid	64-19-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetic acid ethyl ester	141-78-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetic acid n-butyl ester	123-86-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetonitrile	75-05-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acrolein	107-02-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acrylonitrile	107-13-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bis(isopropyl)ether	108-20-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Butane	106-97-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Carbon disulfide	75-15-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyanogen	460-19-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexane	110-82-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexanone	108-94-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexene	110-83-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclopentane	287-92-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl alcohol	64-17-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl ether	60-29-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl methacrylate	97-63-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formaldehyde	50-00-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formamide	75-12-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formic acid	64-18-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formic acid, methyl ester	107-31-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Glycidylaldehyde	765-34-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl acetate	79-20-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl alcohol	67-56-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl isocyanate	624-83-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl methacrylate	80-62-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl tert-butyl ether	1634-04-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylacetylene	74-99-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylcyclohexane	108-87-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N,N-Dimethylacetamide	127-19-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Butyl alcohol	71-36-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Heptane	142-82-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Hexane	110-54-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitromethane	75-52-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Nonane	111-84-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Octane	111-65-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Pentane	109-66-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Propionaldehyde	123-38-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Propyl alcohol	71-23-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Valeraldehyde	110-62-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-4 Derivation of Toxicity Reference Values (TRVs) for Exposure of Bird Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Oxirane	75-21-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Cymene	99-87-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phosgene	75-44-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propargyl alcohol	107-19-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propionic acid	79-09-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propionitrile	107-12-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propylene glycol monomethyl ether	107-98-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-tert-Butyltoluene	98-51-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Triethylamine	121-44-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trimethylamine	75-50-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Vinyl acetate	108-05-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Non-aromatic Halogenated Hydrocarbons											
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,1,2-Tetrachloroethane	630-20-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,1-Trichloroethane	71-55-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,2,2-Tetrachloroethane	79-34-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,2,2-Tetrachloroethene	127-18-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,2-Trichloroethane	79-00-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,2-Trichloroethylene	79-01-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1-Dichloroethane	75-34-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1-Dichloroethene	75-35-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3-Trichloropropane	96-18-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dibromo-3-chloropropane	96-12-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichloroethane	107-06-2	Chronic	NOAEL	Chicken	1.60E+00	1.72E+04	1.0E+00	1.0E+00	Impaired reproduction	1.72E+04	Alumot and others (1976) in Sample and others (1996)
1,2-Dichloroethylene	540-59-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichloropropane	78-87-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Dichloropropene	542-75-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,4-Dichloro-2-butene	764-41-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1-Chloroethene	75-01-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,2-Dichloropropionic acid	75-99-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chloropropane	75-29-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Chloropropene (Allyl chloride)	107-05-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromochloromethane	74-97-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromodichloromethane	75-27-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromoethene	593-60-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromoform	75-25-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromomethane	74-83-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Carbon tetrachloride	56-23-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorodibromomethane	124-48-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorodifluoromethane	75-45-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-4 Derivation of Toxicity Reference Values (TRVs) for Exposure of Bird Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Chloroethane	75-00-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloroform	67-66-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloromethane	74-87-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloropentafluoroethane	76-15-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
cis-1,2-Dichloroethene	156-59-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
cis-1,3-Dichloropropene	10061-01-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyanogen bromide	506-68-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyanogen chloride	506-77-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichlorodifluoromethane	75-71-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichlorofluoromethane	75-43-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloromethane	75-09-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Difluorodibromomethane	75-61-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexafluoroacetone	684-16-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Iodomethane	74-88-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylene bromide	74-95-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachloroethane	76-01-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
trans-1,2-Dichloroethylene	156-60-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
trans-1,3-Dichloropropene	10061-02-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichloroacetic acid	76-03-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichlorofluoroethane	27154-33-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichlorofluoromethane	75-69-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trifluorobromomethane	75-63-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dioxin and Furan Compounds (PCDDs/PCDFs)											
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	Subchronic	NOAEL	Ring-necked Pheasant	1.00E+00	1.00E-02	1.0E+00	1.0E+00	Impaired reproduction	1.00E-02	Nosek and others (1992) in EPA (1999)
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	Subchronic	LOAEL	Chick (1 day old)	1.21E-01	1.00E-01	1.0E-01	1.0E-01	Mortality	1.00E-03	McKinney and others (1976) in Sample and others (1996)
Dibenzofuran	132-64-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Octachlorodibenzo(p)dioxin	3268-87-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Octachlorodibenzofuran	39001-02-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Total dioxins and dibenzofurans	No CAS#	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-4 Derivation of Toxicity Reference Values (TRVs) for Exposure of Bird Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Polychlorinated Biphenyls (PCBs)											
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Polychlorinated biphenyls (PCBs)[a]	1336-36-3	Chronic	LOAEL	Ringed dove	1.55E-01	7.20E+02	1.0E+00	1.0E-01	Impaired reproduction	7.20E+01	Peakall and others (1972) in EPA (1999)
Phthalates											
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	Subchronic	NOAEL	Ringed dove	1.55E-01	1.11E+03	1.0E-01	1.0E+00	Impaired reproduction	1.11E+02	Peakall (1974) in EPA (1999)
Butylbenzyl phthalate	85-68-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibutyl phthalate	84-74-2	Chronic	LOAEL	Ringed dove	1.55E-01	1.11E+03	1.0E-01	1.0E+00	Impaired reproduction	1.11E+02	Peakall (1974) in Sample and others (1996)
Diethyl phthalate	84-66-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dimethyl phthalate	131-11-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Dioctyl phthalate	117-84-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)											
2-Chloronaphthalene	91-58-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methyl naphthalene	91-57-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
5-Nitroacenaphthene	602-87-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acenaphthene	83-32-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acenaphthylene	208-96-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Anthracene	120-12-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Fluorene	86-73-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Indene	95-13-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Naphthalene	91-20-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phenanthrene	85-01-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pyrene	129-00-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-4 Derivation of Toxicity Reference Values (TRVs) for Exposure of Bird Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)											
3-Methylcholanthrene	56-49-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
5-Methylchrysene	3697-24-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[a]anthracene	56-55-3	Acute	LD50	Chicken (embryo)	No data	7.90E+01	1.0E-02	1.0E+00	Mortality	7.90E-01	Brunström and others (1991) in EPA (1999)
Benzo[a]pyrene	50-32-8	Acute	NOAEL	Chicken (embryo)	No data	1.00E+02	1.0E-02	1.0E+00	Mortality	1.00E+00	Brunström and others (1991) in EPA (1999)
Benzo[a,i]pyrene	191-30-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[b]fluoranthene	205-99-2	NA	NA	NA	NA	NA	NA	NA	NA	1.40E-01	TRV for benzo[k]fluoranthene used as surrogate (EPA 1999)
Benzo[e]pyrene	192-97-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[g,h,i]perylene	191-24-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[j]fluoranthene	205-82-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[k]fluoranthene	207-08-9	Acute	LD50	Chicken (embryo)	No data	1.40E+01	1.0E-02	1.0E+00	Mortality	1.40E-01	Brunström and others (1991) in EPA (1999)
Chrysene	218-01-9	Acute	LOAEL	Chicken (embryo)	No data	1.00E+02	1.0E-02	1.0E+00	Mortality	1.00E+00	Brunström and others (1991) in EPA (1999)
Dibenz[a,h]acridine	226-36-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenz[a,h]anthracene	53-70-3	Acute	LD50	Chicken (embryo)	No data	3.90E+01	1.0E-02	1.0E+00	Mortality	3.90E-01	Brunström and others (1991) in EPA (1999)
Dibenz[a,j]acridine	224-42-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,e]fluoranthene	5385-75-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,e]pyrene	192-65-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,h]fluoranthene	No CAS#	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,h]pyrene	189-64-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,i]pyrene	189-55-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Fluoranthene	206-44-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexachloronaphthalene	1335-87-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Indeno[1,2,3-cd]pyrene	193-39-5	Acute	LOAEL	Chicken (embryo)	No data	1.00E+02	1.0E-02	1.0E+00	Mortality	1.00E+00	Brunström and others (1991) in EPA (1999)
Octachloronaphthalene	2234-13-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachloronaphthalene	1321-64-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tetrachloronaphthalene	1335-88-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichloronaphthalene	1321-65-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Light Substituted Benzene Compounds (molecular weight <200 g/mole)											
1,2,3-Trichlorobenzene	87-61-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,4-Trichlorobenzene	120-82-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,4-Trimethyl benzene	95-63-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichlorobenzene	95-50-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3,5-Trimethyl benzene	108-67-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Dichlorobenzene	541-73-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Dinitrobenzene	99-65-0	Acute	LD50	Red-winged blackbird	No data	4.20E+01	1.0E-02	1.0E+00	Mortality	4.22E-01	Schafer (1972) in EPA (1999)
1,4-Dichlorobenzene	106-46-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-4 Derivation of Toxicity Reference Values (TRVs) for Exposure of Bird Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
1,4-Dinitrobenzene	100-25-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4,5-Trichlorophenol	95-95-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4,6-Trichlorophenol	88-06-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-Dichlorophenol	120-83-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-Dimethylphenol	105-67-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-Dinitrophenol	51-28-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-Dinitrotoluene	121-14-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,6-Dinitrotoluene	606-20-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chlorophenol	95-57-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chlorotoluene	95-49-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Nitrophenol	88-75-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,6-Dinitro-o-cresol	534-52-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Chlorotoluene	106-43-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Nitrophenol	100-02-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
alpha-Methylstyrene	98-83-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Aniline	62-53-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzotrichloride	98-07-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzyl chloride	100-44-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromobenzene	108-86-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorobenzene	108-90-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cumene	98-82-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
m-Cresol	108-39-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Butyl benzene	104-51-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrobenzene	98-95-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Propyl benzene	103-65-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Cresol	95-48-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Dinitrobenzene	528-29-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Nitroaniline	88-74-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Toluidine	95-53-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Chloroaniline	106-47-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Cresol	106-44-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phenol	108-95-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Nitrochlorobenzene	100-00-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Toluidine	106-49-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
sec-Butyl benzene	135-98-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
tert-Butyl benzene	98-06-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Toluene-2,6-diamine	823-40-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trimethyl benzene	25551-13-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Other Light Semivolatile Compounds (molecular weight <200 g/mole)											
1,1'-Biphenyl	92-52-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1-Dimethylhydrazine	57-14-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dimethylhydrazine	540-73-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Diphenylhydrazine	122-66-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Propane sultone	1120-71-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-4 Derivation of Toxicity Reference Values (TRVs) for Exposure of Bird Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
2,4-Toluene diisocyanate	584-84-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chloroacetophenone	532-27-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Propenoic acid	79-10-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,4'-Methylenedianiline	101-77-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetophenone	98-86-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzoic acid	65-85-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bis(2-chloroethoxy)methane	111-91-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bis(2-chloroethyl) ether	111-44-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorocyclopentadiene	41851-50-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexanol	108-93-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloroisopropyl ether	108-60-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloromethyl ether	542-88-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloropentadiene	61626-71-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dimethyl sulfate	77-78-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dimethylaniline	121-69-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
di-n-Propylnitrosamine	621-64-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Diphenyl ether	101-84-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Epichlorohydrin	106-89-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl Carbamate (Urethane)	51-79-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl methanesulfonate	62-50-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene dibromide	106-93-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene glycol	107-21-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene glycol monobutyl ether	111-76-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene glycol monoethyl ether acetate	111-15-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene thiourea	96-45-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Furfural	98-01-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Maleic hydrazide	123-33-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Malononitrile	109-77-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl styrene (mixed isomers)	25013-15-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylhydrazine	60-34-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N,N-Diphenylamine	122-39-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitric acid, propyl ester	627-13-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N-Nitrosodi-n-butylamine	924-16-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N-Nitrosomorpholine	59-89-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N-Nitroso-N,N-dimethylamine	62-75-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Anisidine	90-04-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Oxalic acid	144-62-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phthalic anhydride	85-44-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Phthalic acid	100-21-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pyridine	110-86-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Quinoline	91-22-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Quinone	106-51-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Safrole	94-59-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tetrahydrofuran	109-99-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-4 Derivation of Toxicity Reference Values (TRVs) for Exposure of Bird Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)											
1,2,4,5-Tetrachlorobenzene	95-94-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3,5-Trinitrobenzene	99-35-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-sec-Butyl-4,6-dinitrophenol	88-85-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3'-Dichlorobenzidine	91-94-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3'-Dimethoxybenzidine	119-90-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Bromophenylphenyl ether	101-55-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ammonium perfluorooctanoate	3825-26-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Azobenzene	103-33-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	96-69-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Captan	133-06-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorobenzilate	510-15-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibutylphosphate	107-66-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dimethyl aminoazobenzene	60-11-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexachlorobenzene	118-74-1	Acute	NOAEL	Japanese quail	No data	2.25E+04	1.0E-02	1.0E+00	No data	2.25E+02	Hill and Camardese (1986) in EPA (1999)
Hexachlorobutadiene	87-68-3	Chronic	NOAEL	Japanese quail	No data	3.19E+03	1.0E+00	1.0E+00	No data	3.19E+03	Schwetz and others (1974) in EPA (1999)
Hexachlorocyclopentadiene	77-47-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexachloroethane	67-72-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexachlorophene	70-30-4	Acute	LD50	Bobwhite quail	No data	5.75E+05	1.0E-02	1.0E+00	Mortality	5.75E+03	Meister (1994) in EPA (1999)
Hexamethylene-1,5-diisocyanate	822-06-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Mirex	2385-85-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrofen	1836-75-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachlorobenzene	608-93-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachloronitrobenzene	82-68-8	Chronic	NOAEL	Chicken	1.50E+00	6.88E+04	1.0E+00	1.0E+00	No data	6.88E+04	Dunn and others (1979) in EPA (1999)
Pentachlorophenol	87-86-5	Acute	NOAEL	Japanese quail	No data	4.03E+05	1.0E-02	1.0E+00	No data	4.03E+03	Hill and Camardese (1986) in EPA (1999)
Picric acid	88-89-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pronamide	23950-58-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Strychnine	57-24-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Terphenyls	26140-60-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tributyl phosphate	126-73-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trifluralin	1582-09-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Triphenylamine	603-34-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Herbicides and Organochlorinated Pesticides											
2,4,5-T	93-76-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-D and esters	94-75-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,4'-DDD	72-54-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,4'-DDE	72-55-9	Acute	LOAEL	Japanese quail	No data	8.45E+04	1.0E-01	1.0E-01	Mortality	8.45E+02	Hill and Camardese (1986) in EPA (1999)

Table C3-4 Derivation of Toxicity Reference Values (TRVs) for Exposure of Bird Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
4,4'-DDT	50-29-3	Chronic	LOAEL	Brown pelican	3.50E+00	2.80E+01	1.0E+00	1.0E-01	Impaired reproduction	2.80E+00	Anderson and others (1975) in Sample and others (1996)
Aldrin	309-00-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
alpha-BHC	319-84-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
beta-BHC	319-85-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlordane	57-74-9	Chronic	NOAEL	Red-winged blackbird	6.40E-02	2.14E+03	1.0E+00	1.0E+00	Mortality	2.14E+03	Stickel and others (1983) in Sample and others (1996)
delta-BHC	319-86-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dieldrin	60-57-1	Chronic	NOAEL	Barn owl	4.66E-01	7.70E+01	1.0E+00	1.0E+00	Impaired reproduction	7.70E+01	Mendenhall and others (1983) in Sample and others (1996)
Endothall	145-73-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Endrin	72-20-8	Chronic	NOAEL	Mallard duck	1.15E+00	3.00E+02	1.0E+00	1.0E+00	Impaired reproduction	3.00E+02	Spann and others (1986) in Sample and others (1996)
gamma-BHC (Lindane)	58-89-9	Chronic	NOAEL	Mallard duck	1.00E+00	2.00E+03	1.0E+00	1.0E+00	Impaired reproduction	2.00E+03	Chakravarty and Lahiri (1986) in Sample and others (1996)
Heptachlor	76-44-8	Acute	LOAEL	Japanese quail	No data	6.50E+03	1.0E-01	1.0E-01	Mortality	6.50E+01	Hill and Camardese (1986) in EPA (1999)
Isodrin	465-73-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methoxychlor	72-43-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Silvex (2,4,5-TP)	93-72-1	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Toxaphene	8001-35-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Inorganic Chemicals and Compounds						(mg/kgBW/d)				(mg/kgBW/d)	
	Metals										
Aluminum	7429-90-5	Chronic	NOAEL	Ringed dove	1.55E-01	1.10E+02	1.0E+00	1.0E+00	Impaired reproduction	1.00E+02	Carriere and others (1986) in EPA (1999)
Antimony	7440-36-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Arsenic	7440-38-2	Chronic	NOAEL	Brown-headed cowbird	No data	2.46E+00	1.0E+00	1.0E+00	Mortality	2.46E+00	USFWS (1969) in EPA (1999)
Barium	7440-39-3	Subchronic	NOAEL	Chick (14 day old)	1.21E-01	2.08E+02	1.0E-01	1.0E+00	Mortality	2.08E+01	Johnson and others (1960) in EPA (1999)
Beryllium	7440-41-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bismuth	7440-69-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Boron	7440-42-8	Chronic	NOAEL	Mallard duck	1.00E+00	2.88E+01	1.0E+00	1.0E+00	Impaired reproduction	2.88E+01	Smith and Anders (1989) in Sample and others (1996)
Cadmium	7440-43-9	Chronic	NOAEL	Mallard duck	1.15E+00	1.45E+00	1.0E+00	1.0E+00	Impaired reproduction	1.45E+00	White and Finley (1978) in EPA (1999)
Calcium	7440-70-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chromium[b]	18540-29-9	Chronic	NOAEL	Black duck	1.25E+00	1.00E+00	1.0E+00	1.0E+00	Impaired reproduction	1.00E+00	Haseltine and others (1985) in EPA (1999)
Cobalt	7440-48-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Copper	7440-50-8	Chronic	NOAEL	Chick (5 week old)	5.34E-01	4.70E+01	1.0E+00	1.0E+00	Mortality	4.70E+01	Mehring and others (1960) in EPA (1999)
Iron	7439-89-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-4 Derivation of Toxicity Reference Values (TRVs) for Exposure of Bird Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Lead	7439-92-1	Acute	LOAEL	Ringed dove	No data	2.50E+01	1.0E-02	1.0E-01	Abnormal enzyme levels	2.50E-02	Kendall and Scanlon (1982) in EPA (1999)
Lithium	7439-93-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Magnesium	7439-95-4	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Manganese	7439-96-5	Chronic	NOAEL	Quail	7.20E-02	9.77E+02	1.0E+00	1.0E+00	Reduced growth	9.77E+02	Laskey and Edens (1985) in Sample and others (1996)
Mercury	7439-97-6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury - Hg+2	7487-94-7	Acute	LOAEL	Japanese quail	No data	3.25E+02	1.0E-01	1.0E-01	Mortality	3.25E+00	Hill and Camardese (1986) in EPA (1999)a
Methylmercury	22967-92-6	Chronic	LOAEL	Mallard duck	No data	6.40E-02	1.0E+00	1.0E-01	Mortality	6.40E-03	Heinz (1979) in EPA (1999)
Molybdenum	7439-98-7	Chronic	LOAEL	Chicken	1.50E+00	3.53E+01	1.0E+00	1.0E-01	Impaired reproduction	3.53E+00	Lepore and Miller (1965) in Sample and others (1996)
Nickel	7440-02-0	Subchronic	NOAEL	Japanese quail	No data	6.50E+02	1.0E-01	1.0E+00	No data	6.50E+01	Hill and Camardese (1986) in EPA (1999)a
Potassium	7440-09-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Rhodium	7440-16-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Selenium	7782-49-2	Chronic	NOAEL	Mallard duck	1.00E+00	5.00E-01	1.0E+00	1.0E+00	Impaired reproduction	5.00E-01	Heinz and others (1987) in EPA (1999)
Silicon	7440-21-3	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Silver	7440-22-4	Subchronic	NOAEL	Mallard	1.00E+00	1.78E+03	1.0E-01	1.0E+00	No data	1.78E+02	EPA (1997) in EPA (1999)
Sodium	7440-23-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Strontium	7440-24-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tantalum	7440-25-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Thallium	7440-28-0	Acute	LD50	Starling	No data	3.50E+01	1.0E-02	1.0E+00	Mortality	3.50E-01	Schafer (1972) in EPA (1999)
Tin	7440-31-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tungsten	7440-33-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Uranium	7440-61-1	Subchronic	NOAEL	Black duck	1.25E+00	1.60E+02	1.0E-01	1.0E+00	Metabolic	1.60E+01	Haseltine and Sileo (1983) in Sample and others (1996)
Vanadium	7440-62-2	Chronic	NOAEL	Mallard duck	1.17E+00	1.14E+01	1.0E+00	1.0E+00	Mortality	1.14E+01	White and Dieter (1978) in Sample and others (1996)
Yttrium	7440-65-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Zinc	7440-66-6	Chronic	NOAEL	Leghorn chicken	1.94E+00	1.31E+02	1.0E+00	1.0E+00	Impaired reproduction	1.31E+02	Stahl and others (1990) in EPA (1999)
Zirconium	7440-67-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Non-metals and Anions											
Ammonia/Ammonium	7664-41-7	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromide	24959-67-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloride	16887-00-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyanide	57-12-5	Acute	LD50	American kestrel	No data	4.00E+00	1.0E-01	1.0E-01	Mortality	4.00E-02	Wiemeyer and others (1986) in EPA (1999)
Fluoride	16984-48-8	Chronic	NOAEL	Screech owl	1.81E-01	7.80E+00	1.0E+00	1.0E+00	Impaired reproduction	7.80E+00	Pattee and others (1988) in Sample and others (1996)
Hydroxide	14280-30-9	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Iodine	7553-56-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-4 Derivation of Toxicity Reference Values (TRVs) for Exposure of Bird Species to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Test species body weight (kg) BWt	Endpoint dose (ED)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	NOAEL TRV (ED × DCF × ECF)	Source
Nitrate	14797-55-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrite	14797-65-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phosphate	14265-44-2	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phosphorus	7723-14-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Sulfate	14808-79-8	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Total Sulfur	63705-05-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
	Criteria Pollutants										
Carbon monoxide	630-08-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrogen dioxide	10102-44-0	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ozone	10028-15-6	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Particulate matter	No CAS#	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Sulfur dioxide	7446-09-5	No data	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Radionuclides											
All radionuclides combined (rad/d)[c]	No CAS #	Chronic	Adverse effects	Birds	NA	NA	NA	NA	Population effects	1.00E-01	IAEA (1992)

Notes/Sources

No data = No data available.
NA = Not applicable.
CAS = Chemical Abstracts Service.
ED = Dose that caused the reported effect.
DCF = Duration conversion factor; 1 if chronic, 0.1 if subchronic (Sample and others 1996) or inferred from information presented in EPA (1999) Table E-8.
ECF = Endpoint conversion factor; 1 if NOAEL, 0.1 if LOAEL (Sample and others 1996) or inferred from information presented in EPA (1999) Table E-8.
TRV = Toxicity reference value.
LOAEL = Lowest observed adverse effect level.
NOAEL = No observed adverse effect level.
[a] Data for Aroclor-1254 used as representative of polychlorinated biphenyl mixtures.
[b] Values for hexavalent chromium, which is more toxic than trivalent chromium.
[c] TRV is not applicable to single radionuclides. Combined external and internal radiation exposure for birds from all radionuclides combined cannot exceed 0.1 rad/d.

Table C3-5 Derivation of Surface Water Toxicity Reference Values (TRVs) for Exposure of Aquatic Biota to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Organic Compounds					(µg/L)				(µg/L)	
Aromatic Halogenated Hydrocarbons										
2,3,4,6-Tetrachlorophenol	58-90-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Chloro-3-methylphenol	59-50-7	Acute	LOEL	Aquatic biota	3.00E+01	1.0E-01	1.0E-01	Mortality	3.00E-01	EPA (1987)
Aromatic Nonhalogenated Hydrocarbons										
2-Nitrotoluene	88-72-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Nitrobiphenyl	92-93-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzaldehyde	100-52-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzene	71-43-2	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.30E+02	Tier II SCV in Suter and Tsao (1996)
Benzyl alcohol	100-51-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	8.60E+00	Tier II SCV in Suter and Tsao (1996)
Ethyl benzene	100-41-4	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	7.30E+00	Tier II SCV in Suter and Tsao (1996)
m-Xylene	108-38-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.80E+00	Tier II SCV in Suter and Tsao (1996)
o-Xylene	95-47-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Xylene	106-42-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Styrene	100-42-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Toluene	108-88-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	9.80E+00	Tier II SCV in Suter and Tsao (1996)
Non-aromatic Nonhalogenated Hydrocarbons										
1,2-Epoxybutane	106-88-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Butadiene	106-99-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,4-Dioxane	123-91-1	Acute	EC20	*Daphnia magna*	6.21E+06	1.0E-01	1.0E-01	Mortality	6.21E+04	Bringmann and Kuehn (1982) in EPA (1999)
1-Methylpropyl alcohol	78-92-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1-Nitropropane	108-03-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,2,4-Trimethylpentane	540-84-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Butanone	78-93-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.40E+04	Tier II SCV in Suter and Tsao (1996)
2-Butenaldehyde (2-Butenal)	4170-30-3	Acute	LC50	*Lepomis macrochirus*	3.50E+03	1.0E-01	1.0E-01	No data	3.50E+01	Dawson and others (1977) in EPA (1999)
2-Ethoxyethanol	110-80-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Heptanone	110-43-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Hexanone	591-78-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	9.90E+01	Tier II SCV in Suter and Tsao (1996)
2-Methoxyethanol	109-86-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methyl-2-propanol	75-65-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methyl-2-propenenitrile	126-98-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methylaziridine	75-55-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methylpropyl alcohol	78-83-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Pentanone	107-87-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-5 Derivation of Surface Water Toxicity Reference Values (TRVs) for Exposure of Aquatic Biota to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
2-Propanone (Acetone)	67-64-1	Chronic	No data	Aquatic biota	1.50E+03	No data	No data	Tier II SCV	1.50E+03	Tier II SCV from Suter and Tsao (1996) in EPA (1999)
2-Propene-1-ol	107-18-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Propyl alcohol	67-63-0	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	7.50E+00	Tier II SCV in Suter and Tsao (1996)
3-Heptanone	106-35-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Methyl-1-butanol	123-51-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Methyl-2-butanone	563-80-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Pentanone	96-22-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Heptanone	123-19-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Methyl-2-pentanone	108-10-1	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.70E+02	Tier II SCV in Suter and Tsao (1996)
4-Methyl-3-penten-2-one	141-79-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
5-Methyl-2-hexanone	110-12-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetaldehyde	75-07-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetamide	60-35-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetic acid	64-19-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetic acid ethyl ester	141-78-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetic acid n-butyl ester	123-86-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetonitrile	75-05-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acrolein	107-02-8	Chronic	LOEL	Aquatic biota	2.10E+01	1.0E+00	1.0E-01	Mortality	2.10E+00	EPA (1987)
Acrylonitrile	107-13-1	Chronic	LOEL	Aquatic biota	2.60E+03	1.0E+00	1.0E-01	Mortality	2.60E+02	EPA (1987) in EPA (1999)
Bis(isopropyl)ether	108-20-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Butane	106-97-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Carbon disulfide	75-15-0	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	9.20E-01	Tier II SCV in Suter and Tsao (1996)
Cyanogen	460-19-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexane	110-82-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexanone	108-94-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexene	110-83-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclopentane	287-92-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl alcohol	64-17-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl ether	60-29-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl methacrylate	97-63-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formaldehyde	50-00-0	Acute	LC50	No data	4.96E+03	1.0E-01	1.0E-01	No data	4.96E+01	TRV for formalin (Reardon and Harrell 1990) used as surrogate (EPA 1999)
Formamide	75-12-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formic acid	64-18-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formic acid, methyl ester	107-31-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Glycidylaldehyde	765-34-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl acetate	79-20-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl alcohol	67-56-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl isocyanate	624-83-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-5 Derivation of Surface Water Toxicity Reference Values (TRVs) for Exposure of Aquatic Biota to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Methyl methacrylate	80-62-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl tert-butyl ether	1634-04-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylacetylene	74-99-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylcyclohexane	108-87-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N,N-Dimethylacetamide	127-19-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Butyl alcohol	71-36-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Heptane	142-82-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Hexane	110-54-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	5.80E-01	Tier II SCV in Suter and Tsao (1996)
Nitromethane	75-52-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Nonane	111-84-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Octane	111-65-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Pentane	109-66-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Propionaldehyde	123-38-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Propyl alcohol	71-23-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Valeraldehyde	110-62-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Oxirane	75-21-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Cymene	99-87-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phosgene	75-44-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propargyl alcohol	107-19-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propionic acid	79-09-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propionitrile	107-12-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propylene glycol monomethyl ether	107-98-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-tert-Butyltoluene	98-51-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Triethylamine	121-44-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trimethylamine	75-50-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Vinyl acetate	108-05-4	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.60E+01	Tier II SCV in Suter and Tsao (1996)
Non-aromatic Halogenated Hydrocarbons										
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,1,2-Tetrachloroethane	630-20-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,1-Trichloroethane	71-55-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.10E+01	Tier II SCV in Suter and Tsao (1996)
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,2,2-Tetrachloroethane	79-34-5	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	6.10E+02	Tier II SCV in Suter and Tsao (1996)
1,1,2,2-Tetrachloroethene	127-18-4	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	9.80E+01	Tier II SCV in Suter and Tsao (1996)
1,1,2-Trichloroethane	79-00-5	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.20E+03	Tier II SCV in Suter and Tsao (1996)
1,1,2-Trichloroethylene	79-01-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	4.70E+01	Tier II SCV in Suter and Tsao (1996)
1,1-Dichloroethane	75-34-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	4.70E+01	Tier II SCV in Suter and Tsao (1996)

Table C3-5 Derivation of Surface Water Toxicity Reference Values (TRVs) for Exposure of Aquatic Biota to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
1,1-Dichloroethene	75-35-4	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.50E+01	Tier II SCV in Suter and Tsao (1996)
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3-Trichloropropane	96-18-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dibromo-3-chloropropane	96-12-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichloroethane	107-06-2	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	9.10E+02	Tier II SCV in Suter and Tsao (1996)
1,2-Dichloroethylene	540-59-0	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	5.90E+02	Tier II SCV in Suter and Tsao (1996)
1,2-Dichloropropane	78-87-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Dichloropropene	542-75-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	5.50E-02	Tier II SCV in Suter and Tsao (1996)
1,4-Dichloro-2-butene	764-41-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1-Chloroethene	75-01-4	Subchronic	LC100	No data	3.88E+05	1.0E-01	1.0E-01	No data	3.88E+03	Brown and others (1977) in EPA (1999)
2,2-Dichloropropionic acid	75-99-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chloropropane	75-29-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Chloropropene (Allyl chloride)	107-05-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromochloromethane	74-97-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromodichloromethane	75-27-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromoethene	593-60-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromoform	75-25-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromomethane	74-83-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Carbon tetrachloride	56-23-5	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	9.80E+00	Tier II SCV in Suter and Tsao (1996)
Chlorodibromomethane	124-48-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorodifluoromethane	75-45-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloroethane	75-00-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloroform	67-66-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.80E+01	Tier II SCV from Suter and Tsao (1996) in EPA (1999)
Chloromethane	74-87-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloropentafluoroethane	76-15-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
cis-1,2-Dichloroethene	156-59-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
cis-1,3-Dichloropropene	10061-01-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyanogen bromide	506-68-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyanogen chloride	506-77-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichlorodifluoromethane	75-71-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichlorofluoromethane	75-43-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloromethane	75-09-2	Chronic	No data	Aquatic biota	2.20E+03	No data	No data	Tier II SCV	2.20E+03	Tier II SCV in Suter and Tsao (1996)
Difluorodibromomethane	75-61-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexafluoroacetone	684-16-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Iodomethane	74-88-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylene bromide	74-95-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-5 Derivation of Surface Water Toxicity Reference Values (TRVs) for Exposure of Aquatic Biota to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Pentachloroethane	76-01-7	Chronic	LOEL	Aquatic biota	3.90E+02	1.0E+00	1.0E-01	Mortality	3.90E+01	EPA (1987)
trans-1,2-Dichloroethylene	156-60-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
trans-1,3-Dichloropropene	10061-02-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichloroacetic acid	76-03-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichlorofluoroethane	27154-33-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichlorofluoromethane	75-69-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trifluorobromomethane	75-63-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dioxin and Furan Compounds (PCDDs/PCDFs)										
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	Chronic	LOEL	*Onchorynchus mykiss*	3.80E-05	1.0E+00	1.0E-01	Mortality	3.80E-06	Mehrle and others (1988) in EPA (1999)
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzofuran	132-64-9	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	3.70E+00	Tier II SCV in Suter and Tsao (1996)
Octachlorodibenzo(p)dioxin	3268-87-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Octachlorodibenzofuran	39001-02-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Total dioxins and dibenzofurans	No CAS #	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Polychlorinated Biphenyls (PCBs)										
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-5 Derivation of Surface Water Toxicity Reference Values (TRVs) for Exposure of Aquatic Biota to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Polychlorinated biphenyls (PCBs)[c]	1336-36-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.40E-01	Tier II SCV in Suter and Tsao (1996)
Phthalates										
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	3.00E+00	Tier II SCV from Suter and Tsao (1996) in EPA (1999)
Butylbenzyl phthalate	85-68-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.90E+01	Tier II SCV in Suter and Tsao (1996)
Dibutyl phthalate	84-74-2	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	3.50E+01	Tier II SCV in Suter and Tsao (1996)
Diethyl phthalate	84-66-2	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.10E+02	Tier II SCV in Suter and Tsao (1996)
Dimethyl phthalate	131-11-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Dioctyl phthalate	117-84-0	Chronic	LOEL	*Daphnia magna*	3.20E+02	1.0E+00	1.0E+00	Mortality	3.20E+02	McCarthy and Whitmore (1985) in EPA (1999)
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)										
2-Chloronaphthalene	91-58-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methyl naphthalene	91-57-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
5-Nitroacenaphthene	602-87-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acenaphthene	83-32-9	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.30E+01	Chronic NAWQC in Suter and Tsao (1996)
Acenaphthylene	208-96-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Anthracene	120-12-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	7.30E-01	Tier II SCV in Suter and Tsao (1996)
Fluorene	86-73-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	3.90E+00	Tier II SCV in Suter and Tsao (1996)
Indene	95-13-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Naphthalene	91-20-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.20E+01	Tier II SCV in Suter and Tsao (1996)
Phenanthrene	85-01-8	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	6.30E+00	Chronic NAWQC in Suter and Tsao (1996)
Pyrene	129-00-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)										
3-Methylcholanthrene	56-49-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
5-Methylchrysene	3697-24-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[a]anthracene	56-55-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.70E-02	Tier II SCV from Suter and Tsao (1996) in EPA (1999)
Benzo[a]pyrene	50-32-8	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.40E-02	Tier II SCV from EPA (1996) in EPA (1999)
Benzo[a,i]pyrene	191-30-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[b]fluoranthene	205-99-2	NA	NA	NA	NA	NA	NA	NA	2.70E-02	TRV for benzo[a]anthracene used as surrogate; EPA (1999)
Benzo[e]pyrene	192-97-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[g,h,i]perylene	191-24-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-5 Derivation of Surface Water Toxicity Reference Values (TRVs) for Exposure of Aquatic Biota to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Benzo[j]fluoranthene	205-82-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[k]fluoranthene	207-08-9	NA	NA	NA	NA	NA	NA	NA	2.70E-02	TRV for benzo[a]anthracene used as surrogate; EPA (1999)
Chrysene	218-01-9	NA	NA	NA	NA	NA	NA	NA	2.70E-02	TRV for benzo[a]anthracene used as surrogate; EPA (1999)
Dibenz[a,h]acridine	226-36-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenz[a,h]anthracene	53-70-3	NA	NA	NA	NA	NA	NA	NA	2.70E-02	TRV for benzo[a]anthracene used as surrogate; EPA (1999)
Dibenz[a,j]acridine	224-42-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,e]fluoranthene	5385-75-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,e]pyrene	192-65-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,h]fluoranthene	No CAS #	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,h]pyrene	189-64-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,i]pyrene	189-55-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Fluoranthene	206-44-0	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	6.16E+00	Chronic NAWQC in Suter and Tsao (1996)
Hexachloronaphthalene	1335-87-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Indeno[1,2,3-cd]pyrene	193-39-5	NA	NA	NA	NA	NA	NA	NA	2.70E-02	TRV for benzo[a]anthracene used as surrogate; EPA (1999)
Octachloronaphthalene	2234-13-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachloronaphthalene	1321-64-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tetrachloronaphthalene	1335-88-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichloronaphthalene	1321-65-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Light Substituted Benzene Compounds (molecular weight <200 g/mole)										
1,2,3-Trichlorobenzene	87-61-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,4-Trichlorobenzene	120-82-1	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.10E+02	Tier II SCV in Suter and Tsao (1996)
1,2,4-Trimethyl benzene	95-63-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichlorobenzene	95-50-1	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.40E+01	Tier II SCV in Suter and Tsao (1996)
1,3,5-Trimethyl benzene	108-67-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Dichlorobenzene	541-73-1	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	7.10E+01	Tier II SCV in Suter and Tsao (1996)
1,3-Dinitrobenzene	99-65-0	Subchronic	NOEC	*Selanastrum capricornutum*	2.60E+02	1.0E-01	1.0E+00	Reduced growth	2.60E+01	van der Schalie (1983) in EPA (1999)
1,4-Dichlorobenzene	106-46-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.50E+01	Tier II SCV in Suter and Tsao (1996)
1,4-Dinitrobenzene	100-25-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4,5-Trichlorophenol	95-95-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4,6-Trichlorophenol	88-06-2	Acute	LOEL	Aquatic biota	9.70E+02	1.0E-01	1.0E-01	Mortality	9.70E+00	EPA (1987)
2,4-Dichlorophenol	120-83-2	Chronic	LOEL	Aquatic biota	3.65E+02	1.0E+00	1.0E-01	Mortality	3.65E+01	EPA (1987)

Table C3-5 Derivation of Surface Water Toxicity Reference Values (TRVs) for Exposure of Aquatic Biota to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
2,4-Dimethylphenol	105-67-9	Acute	LOEL	Aquatic biota	2.12E+03	1.0E-01	1.0E-01	Mortality	2.12E+01	EPA (1987)
2,4-Dinitrophenol	51-28-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-Dinitrotoluene	121-14-2	Chronic	LOEL	Aquatic biota	2.30E+02	1.0E+00	1.0E-01	Mortality	2.30E+01	EPA (1987) in EPA (1999)
2,6-Dinitrotoluene	606-20-2	Chronic	NOEC	*Daphnia magna*	6.00E+01	1.0E+00	1.0E+00	Mortality	6.00E+01	Kuhn and others (1989) in EPA (1999)
2-Chlorophenol	95-57-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chlorotoluene	95-49-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Nitrophenol	88-75-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,6-Dinitro-o-cresol	534-52-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Chlorotoluene	106-43-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Nitrophenol	100-02-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	3.00E+02	Tier II SCV in Suter and Tsao (1996)
alpha-Methylstyrene	98-83-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Aniline	62-53-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzotrichloride	98-07-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzyl chloride	100-44-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromobenzene	108-86-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorobenzene	108-90-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	6.40E+01	Tier II SCV in Suter and Tsao (1996)
Cumene	98-82-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
m-Cresol	108-39-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Butyl benzene	104-51-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrobenzene	98-95-3	Acute	LOEL	Aquatic biota	2.70E+04	1.0E-01	1.0E-01	Mortality	2.70E+02	EPA (1987) in EPA (1999)
n-Propyl benzene	103-65-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Cresol	95-48-7	Chronic	No data	Aquatic biota	1.30E+01	No data	No data	Tier II SCV	1.30E+01	Tier II SCV in Suter and Tsao (1996)
o-Dinitrobenzene	528-29-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Nitroaniline	88-74-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Toluidine	95-53-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Chloroaniline	106-47-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Cresol	106-44-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phenol	108-95-2	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.10E+02	Chronic NAWQC in Suter and Tsao (1996)
p-Nitrochlorobenzene	100-00-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Toluidine	106-49-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
sec-Butyl benzene	135-98-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
tert-Butyl benzene	98-06-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Toluene-2,6-diamine	823-40-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trimethyl benzene	25551-13-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Other Light Semivolatile Compounds (molecular weight <200 g/mole)										
1,1'-Biphenyl	92-52-4	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.40E+01	Tier II SCV in Suter and Tsao (1996)
1,1-Dimethylhydrazine	57-14-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-5 Derivation of Surface Water Toxicity Reference Values (TRVs) for Exposure of Aquatic Biota to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
1,2-Dimethylhydrazine	540-73-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Diphenylhydrazine	122-66-7	Acute	LOEL	Aquatic biota	2.70E+02	1.0E-01	1.0E-01	Mortality	2.70E+00	EPA (1987)
1,3-Propane sultone	1120-71-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-Toluene diisocyanate	584-84-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chloroacetophenone	532-27-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Propenoic acid	79-10-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,4'-Methylenedianiline	101-77-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetophenone	98-86-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzoic acid	65-85-0	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	4.20E+01	Tier II SCV in Suter and Tsao (1996)
Bis(2-chloroethoxy)methane	111-91-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bis(2-chloroethyl) ether	111-44-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorocyclopentadiene	41851-50-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexanol	108-93-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloroisopropyl ether	108-60-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloromethyl ether	542-88-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloropentadiene	61626-71-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dimethyl sulfate	77-78-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dimethylaniline	121-69-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
di-n-Propylnitrosamine	621-64-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Diphenyl ether	101-84-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Epichlorohydrin	106-89-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl carbamate (Urethane)	51-79-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl methanesulfonate	62-50-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene dibromide	106-93-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene glycol	107-21-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene glycol monobutyl ether	111-76-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene glycol monoethyl ether acetate	111-15-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene thiourea	96-45-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Furfural	98-01-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Maleic hydrazide	123-33-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Malononitrile	109-77-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl styrene (mixed isomers)	25013-15-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylhydrazine	60-34-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N,N-Diphenylamine	122-39-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitric acid, propyl ester	627-13-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N-Nitrosodi-n-butylamine	924-16-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N-Nitrosomorpholine	59-89-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N-Nitroso-N,N-dimethylamine	62-75-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Anisidine	90-04-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Oxalic acid	144-62-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phthalic anhydride	85-44-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Phthalic acid	100-21-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pyridine	110-86-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Quinoline	91-22-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-5 Derivation of Surface Water Toxicity Reference Values (TRVs) for Exposure of Aquatic Biota to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Quinone	106-51-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Safrole	94-59-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tetrahydrofuran	109-99-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)										
1,2,4,5-Tetrachlorobenzene	95-94-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3,5-Trinitrobenzene	99-35-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-sec-Butyl-4,6-dinitrophenol	88-85-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3'-Dichlorobenzidine	91-94-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3'-Dimethoxybenzidine	119-90-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Bromophenylphenyl ether	101-55-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.50E+00	Tier II SCV in Suter and Tsao (1996)
Ammonium perfluorooctanoate	3825-26-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Azobenzene	103-33-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	96-69-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Captan	133-06-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorobenzilate	510-15-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibutylphosphate	107-66-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dimethyl aminoazobenzene	60-11-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexachlorobenzene	118-74-1	Chronic	No data	No data	3.68E+00	No data	No data	No data	3.68E+00	EPA (1987) in EPA (1999)
Hexachlorobutadiene	87-68-3	Chronic	LOEL	No data	9.30E+00	1.0E+00	1.0E-01	No data	9.30E-01	EPA (1987) in EPA (1999)
Hexachlorocyclopentadiene	77-47-4	Chronic	LOEL	Aquatic biota	5.20E+00	1.0E+00	1.0E-01	Mortality	5.20E-01	EPA (1987) in EPA (1999)
Hexachloroethane	67-72-1	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.20E+01	Tier II SCV in Suter and Tsao (1996)
Hexachlorophene	70-30-4	Subchronic	NOEC	*Pimphales promelas*	8.80E+00	1.0E-01	1.0E+00	Mortality	8.80E-01	Call and others (1989) in EPA (1999)
Hexamethylene-1,5-diisocyanate	822-06-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Mirex	2385-85-5	No data	No data	No data	1.00E-03	No data	No data	No data	1.00E-03	Freshwater criterion in EPA (1987)
Nitrofen	1836-75-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachlorobenzene	608-93-5	Chronic	No data	No data	4.70E-01	No data	No data	No data	4.70E-01	EPA (1996) in EPA (1999)
Pentachloronitrobenzene	82-68-8	Acute	LC50	*Cyprinus carpio*	1.00E+03	1.0E-01	1.0E-01	Mortality	1.00E+01	Hashimoto and Nishiuchi (1981) in EPA (1999)
Pentachlorophenol	87-86-5	Chronic	No data	No data	1.50E+01	No data	No data	No data	1.50E+01	EPA (1999b) in EPA (1999)
Picric acid	88-89-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pronamide	23950-58-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Strychnine	57-24-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Terphenyls	26140-60-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tributyl phosphate	126-73-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-5 Derivation of Surface Water Toxicity Reference Values (TRVs) for Exposure of Aquatic Biota to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Trifluralin	1582-09-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Triphenylamine	603-34-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Herbicides and Organochlorinated Pesticides										
2,4,5-T	93-76-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-D and esters	94-75-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,4'-DDD	72-54-8	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.10E-02	Tier II SCV in Suter and Tsao (1996)
4,4'-DDE	72-55-9	Acute	LOEL	No data	1.05E+03	1.0E-01	1.0E-01	Mortality	1.05E+01	EPA (1987) in EPA (1999)
4,4'-DDT	50-29-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.30E-02	Tier II SCV in Suter and Tsao (1996)
Aldrin	309-00-2	Chronic	No data	Aquatic biota	No data	No data	No data	Toxic effects	3.00E+00	EPA (1987)
alpha-BHC	319-84-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.20E+00	Tier II SCV in Suter and Tsao (1996)
beta-BHC	319-85-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.20E+00	Tier II SCV in Suter and Tsao (1996)
Chlordane	57-74-9	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.70E-01	Chronic NAWQC in Suter and Tsao (1996)
delta-BHC	319-86-8	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.20E+00	Tier II SCV in Suter and Tsao (1996)
Dieldrin	60-57-1	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	6.20E-02	Chronic NAWQC in Suter and Tsao (1996)
Endothall	145-73-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Endrin	72-20-8	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	6.10E-02	Chronic NAWQC in Suter and Tsao (1996)
gamma-BHC (Lindane)	58-89-9	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	8.00E-02	Chronic NAWQC in Suter and Tsao (1996)
Heptachlor	76-44-8	Chronic	No data	Aquatic biota	3.80E-03	No data	No data	No data	3.80E-03	EPA (1987) in EPA (1999)
Isodrin	465-73-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methoxychlor	72-43-5	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.90E-02	Tier II SCV in Suter and Tsao (1996)
Silvex (2,4,5-TP)	93-72-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Toxaphene	8001-35-2	Acute	LOEL	Aquatic biota	1.75E+04	1.0E-01	1.0E-01	Mortality	1.75E+02	EPA (1987)
Inorganic Chemicals and Compounds					(mg/L)				(mg/L)	
Metals										
Aluminum	7429-90-5	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	8.70E-02	Chronic NAWQC from EPA (1988b) in EPA (1999)
Antimony	7440-36-0	Chronic	LC50	Aquatic biota	Various	No data	No data	No data	3.00E-02	Proposed chronic criterion from EPA (1987) in EPA (1999)
Arsenic	7440-38-2	Chronic	No data	No data	1.50E-01	No data	No data	No data	1.50E-01	Chronic criterion from EPA (1999b) in EPA (1999)

Table C3-5 Derivation of Surface Water Toxicity Reference Values (TRVs) for Exposure of Aquatic Biota to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Barium	7440-39-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	4.00E-03	Tier II SCV in Suter and Tsao (1996)
Beryllium	7440-41-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	6.60E-04	Tier II SCV from Suter and Tsao (1996) in EPA (1999)
Bismuth	7440-69-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Boron	7440-42-8	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.60E-03	Tier II SCV in Suter and Tsao (1996)
Cadmium	7440-43-9	Chronic	No data	No data	2.20E-03	No data	No data	No data	2.20E-03	Chronic criterion from EPA (1999b) in EPA (1999)
Calcium	7440-70-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chromium[d]	18540-29-9	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.10E-02	Chronic criterion from EPA (1999b) in EPA (1999)
Cobalt	7440-48-4	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.30E-02	Tier II SCV in Suter and Tsao (1996)
Copper	7440-50-8	Chronic	No data	No data	9.00E-03	No data	No data	No data	9.00E-03	Chronic criterion from EPA (1999b) in EPA (1999)
Iron	7439-89-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.00E+00	Tier II SCV in Suter and Tsao (1996)
Lead	7439-92-1	Chronic	No data	Aquatic biota	2.50E-03	No data	No data	No data	2.50E-03	Chronic criterion from EPA (1999b) in EPA (1999)
Lithium	7439-93-2	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.40E-02	Tier II SCV in Suter and Tsao (1996)
Magnesium	7439-95-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Manganese	7439-96-5	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.20E-01	Tier II SCV in Suter and Tsao (1996)
Mercury	7439-97-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Mercury - Hg+2	7487-94-7	Chronic	No data	No data	7.70E-04	No data	No data	No data	7.70E-04	Chronic criterion from EPA (1999b) in EPA (1999)
Methylmercury	22967-92-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.80E-06	Tier II SCV from Suter and Tsao (1996) in EPA (1999)
Molybdenum	7439-98-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	3.70E-01	Tier II SCV in Suter and Tsao (1996)
Nickel	7440-02-0	Chronic	No data	Aquatic biota	5.20E-02	No data	No data	No data	5.20E-02	Chronic criterion from EPA (1999b) in EPA (1999)
Potassium	7440-09-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Rhodium	7440-16-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Selenium	7782-49-2	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	5.00E-03	Chronic NAWQC from EPA (1999b) in EPA (1999)
Silicon	7440-21-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Silver	7440-22-4	Chronic	No data	*Onchorynchus mykiss*	1.20E-04	No data	No data	No data	1.20E-04	Proposed Chronic Criterion from EPA (1987) in EPA (1999)
Sodium	7440-23-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Strontium	7440-24-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.50E+00	Tier II SCV in Suter and Tsao (1996)

Table C3-5 Derivation of Surface Water Toxicity Reference Values (TRVs) for Exposure of Aquatic Biota to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Tantalum	7440-25-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Thallium	7440-28-0	Chronic	LOEL	No data	4.00E-02	No data	1.0E-01	No data	4.00E-03	EPA (1987) in EPA (1999)
Tin	7440-31-5	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	7.30E-02	Tier II SCV in Suter and Tsao (1996)
Tungsten	7440-33-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Uranium	7440-61-1	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.60E-03	Tier II SCV in Suter and Tsao (1996)
Vanadium	7440-62-2	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.00E-02	Tier II SCV in Suter and Tsao (1996)
Yttrium	7440-65-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Zinc	7440-66-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.18E-01	Chronic NAWQC from EPA (1999b) in EPA (1999)
Zirconium	7440-67-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.70E-02	Tier II SCV in Suter and Tsao (1996)
Non-metals and Anions										
Ammonia/Ammonium	7664-41-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromide	24959-67-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloride	16887-00-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyanide	57-12-5	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	5.20E-03	Chronic NAWQC from EPA (1999b) in EPA (1999)
Fluoride	16984-48-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hydroxide	14280-30-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Iodine	7553-56-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrate	14797-55-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrite	14797-65-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phosphate	14265-44-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phosphorus	7723-14-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Sulfate	14808-79-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Total sulfur	63705-05-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Criteria Pollutants										
Carbon monoxide	630-08-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrogen dioxide	10102-44-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ozone	10028-15-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Particulate matter	No CAS #	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Sulfur dioxide	7446-09-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Radionuclides										
All radionuclides combined (rad/d)[c]	No CAS #	Chronic	Adverse effects	Aquatic biota	NA	NA	NA	Population effects	1.00E+00	NCRP (1991)

Table C3-5 Derivation of Surface Water Toxicity Reference Values (TRVs) for Exposure of Aquatic Biota to COPCs and ROPCs

Notes/Sources

No data = No data available.
NA = Not applicable.
CAS = Chemical Abstracts Service.
EC = Concentration that caused the reported effect.
DCF = Duration conversion factor; 1 if chronic, 0.1 if subchronic (Sample and others 1996).
ECF = Endpoint conversion factor; 1 if NOAEL, 0.1 if LOAEL (Sample and others 1996).
TRV = Toxicity reference value.
LOAEL = Lowest observed adverse effect level.
LOEL = Lowest exposure level at which an effect was observed.
Tier II SCV = Secondary Chronic Value calculated according to Great Lakes Initiative methods.
LC50 = Concentration lethal to 50 % of tested individuals.
EC20 = Concentration at which an effect was observed in 20 % of tested individuals.
LC100 = Concentration lethal to 100 % of tested individuals.
Chronic NAWQC = Chronic National Ambient Water Quality Criterion.
NOEC = Highest concentration at which an effect was not observed.
EC50 = Concentration at which an effect was observed in 50 % of tested individuals.

[a] Methods to calculate NAWQC and Tier II SCV values are presented in Suter and Tsao (1996).

[b] Order of preference is: EPA (1999), then NAWQC, then Tier II chronic value, then other published data.

[c] Data for Aroclor-1254 used as representative of polychlorinated biphenyl mixtures.

[d] Values for hexavalent chromium, which is more toxic than trivalent chromium.

[e] TRV is not applicable to single radionuclides. Combined external and internal radiation exposure for aquatic biota from all radionuclides combined cannot exceed 1 rad/d.

Table C3-6 Derivation of Surface Water Toxicity Reference Values (TRVs) from Data for Sensitive Species for Exposure of Chinook Salmon and Other Salmonids to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Organic Compounds					(µg/L)				(µg/L)	
Aromatic Halogenated Hydrocarbons										
2,3,4,6-Tetrachlorophenol	58-90-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Chloro-3-methylphenol	59-50-7	Acute	LOEL	Aquatic biota	3.00E+01	1.0E-01	1.0E-01	Mortality	3.00E-01	EPA (1987)
Aromatic Nonhalogenated Hydrocarbons										
2-Nitrotoluene	88-72-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Nitrobiphenyl	92-93-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzaldehyde	100-52-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzene	71-43-2	Acute	LOAEL	*Onchorynchus mykiss*	3.16E+00	1.0E-01	1.0E-01	Mortality	3.16E-02	Suter and Tsao (1996)
Benzyl alcohol	100-51-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	8.60E+00	Tier II SCV in Suter and Tsao (1996)
Ethyl benzene	100-41-4	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	7.30E+00	Tier II SCV in Suter and Tsao (1996)
m-Xylene	108-38-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.80E+00	Tier II SCV in Suter and Tsao (1996)
o-Xylene	95-47-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Xylene	106-42-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Styrene	100-42-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Toluene	108-88-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	9.80E+00	Tier II SCV in Suter and Tsao (1996)
Non-aromatic Nonhalogenated Hydrocarbons										
1,2-Epoxybutane	106-88-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Butadiene	106-99-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,4-Dioxane	123-91-1	Acute	EC20	*Daphnia magna*	6.21E+06	1.0E-01	1.0E-01	Mortality	6.21E+04	Bringmann and Kuehn (1982) in EPA (1999)
1-Methylpropyl alcohol	78-92-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1-Nitropropane	108-03-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,2,4-Trimethylpentane	540-84-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Butanone	78-93-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.40E+04	Tier II SCV in Suter and Tsao (1996)
2-Butenaldehyde (2-Butenal)	4170-30-3	Acute	LC50	*Lepomis macrochirus*	3.50E+03	1.0E-01	1.0E-01	No data	3.50E+01	Dawson and others (1977) in EPA (1999)
2-Ethoxyethanol	110-80-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Heptanone	110-43-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Hexanone	591-78-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	9.90E+01	Tier II SCV in Suter and Tsao (1996)
2-Methoxyethanol	109-86-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methyl-2-propanol	75-65-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methyl-2-propenenitrile	126-98-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methylaziridine	75-55-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methylpropyl alcohol	78-83-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Pentanone	107-87-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-6 Derivation of Surface Water Toxicity Reference Values (TRVs) from Data for Sensitive Species for Exposure of Chinook Salmon and Other Salmonids to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
2-Propanone (Acetone)	67-64-1	Acute	LOAEL	*Onchorynchus mykiss*	1.26E+03	1.0E-01	1.0E-01	No data	1.26E+01	AQUIRE
2-Propene-1-ol	107-18-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Propyl alcohol	67-63-0	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	7.50E+00	Tier II SCV in Suter and Tsao (1996)
3-Heptanone	106-35-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Methyl-1-butanol	123-51-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Methyl-2-butanone	563-80-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Pentanone	96-22-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Heptanone	123-19-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Methyl-2-pentanone	108-10-1	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.70E+02	Tier II SCV in Suter and Tsao (1996)
4-Methyl-3-penten-2-one	141-79-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
5-Methyl-2-hexanone	110-12-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetaldehyde	75-07-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetamide	60-35-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetic acid	64-19-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetic acid ethyl ester	141-78-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetic acid n-butyl ester	123-86-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetonitrile	75-05-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acrolein	107-02-8	Chronic	LOEL	Aquatic biota	2.10E+01	1.0E+00	1.0E-01	Mortality	2.10E+00	EPA (1987)
Acrylonitrile	107-13-1	Chronic	LOEL	Aquatic biota	2.60E+03	1.0E+00	1.0E-01	Mortality	2.60E+02	EPA (1987c) in EPA (1999)
Bis(isopropyl)ether	108-20-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Butane	106-97-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Carbon disulfide	75-15-0	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	9.20E-01	Tier II SCV in Suter and Tsao (1996)
Cyanogen	460-19-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexane	110-82-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexanone	108-94-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexene	110-83-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclopentane	287-92-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl alcohol	64-17-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl ether	60-29-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl methacrylate	97-63-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formaldehyde	50-00-0	Acute	LC50	No data	4.96E+03	1.0E-01	1.0E-01	No data	4.96E+01	TRV for formalin (Reardon and Harrell 1990) used as surrogate (EPA 1999)
Formamide	75-12-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formic acid	64-18-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Formic acid, methyl ester	107-31-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Glycidylaldehyde	765-34-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl acetate	79-20-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-6 Derivation of Surface Water Toxicity Reference Values (TRVs) from Data for Sensitive Species for Exposure of Chinook Salmon and Other Salmonids to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Methyl alcohol	67-56-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl isocyanate	624-83-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl methacrylate	80-62-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl tert-butyl ether	1634-04-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylacetylene	74-99-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylcyclohexane	108-87-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N,N-Dimethylacetamide	127-19-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Butyl alcohol	71-36-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Heptane	142-82-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Hexane	110-54-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	5.80E-01	Tier II SCV in Suter and Tsao (1996)
Nitromethane	75-52-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Nonane	111-84-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Octane	111-65-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Pentane	109-66-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Propionaldehyde	123-38-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Propyl alcohol	71-23-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Valeraldehyde	110-62-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Oxirane	75-21-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Cymene	99-87-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phosgene	75-44-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propargyl alcohol	107-19-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propionic acid	79-09-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propionitrile	107-12-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Propylene glycol monomethyl ether	107-98-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-tert-Butyltoluene	98-51-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Triethylamine	121-44-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trimethylamine	75-50-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Vinyl acetate	108-05-4	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.60E+01	Tier II SCV in Suter and Tsao (1996)
Non-aromatic Halogenated Hydrocarbons										
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,1,2-Tetrachloroethane	630-20-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,1-Trichloroethane	71-55-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.10E+01	Tier II SCV in Suter and Tsao (1996)
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,1,2,2-Tetrachloroethane	79-34-5	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	6.10E+02	Tier II SCV in Suter and Tsao (1996)
1,1,2,2-Tetrachloroethene	127-18-4	Acute	LOAEL	*Onchorynchus mykiss*	3.16E+00	1.0E-01	1.0E-01	No data	3.16E-02	Suter and Tsao (1996)
1,1,2-Trichloroethane	79-00-5	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.20E+03	Tier II SCV in Suter and Tsao (1996)

Table C3-6 Derivation of Surface Water Toxicity Reference Values (TRVs) from Data for Sensitive Species for Exposure of Chinook Salmon and Other Salmonids to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
1,1,2-Trichloroethylene	79-01-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	4.70E+01	Tier II SCV in Suter and Tsao (1996)
1,1-Dichloroethane	75-34-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	4.70E+01	Tier II SCV in Suter and Tsao (1996)
1,1-Dichloroethene	75-35-4	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.50E+01	Tier II SCV in Suter and Tsao (1996)
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3-Trichloropropane	96-18-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dibromo-3-chloropropane	96-12-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dichloroethane	107-06-2	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	9.10E+02	Tier II SCV in Suter and Tsao (1996)
1,2-Dichloroethylene	540-59-0	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	5.90E+02	Tier II SCV in Suter and Tsao (1996)
1,2-Dichloropropane	78-87-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Dichloropropene	542-75-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	5.50E-02	Tier II SCV in Suter and Tsao (1996)
1,4-Dichloro-2-butene	764-41-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1-Chloroethene	75-01-4	Subchronic	LC100	No data	3.88E+05	1.0E-01	1.0E-01	No data	3.88E+03	Brown and others (1977) in EPA (1999)
2,2-Dichloropropionic acid	75-99-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chloropropane	75-29-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3-Chloropropene (Allyl chloride)	107-05-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromochloromethane	74-97-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromodichloromethane	75-27-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromoethene	593-60-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromoform	75-25-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromomethane	74-83-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Carbon tetrachloride	56-23-5	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	9.80E+00	Tier II SCV in Suter and Tsao (1996)
Chlorodibromomethane	124-48-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorodifluoromethane	75-45-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloroethane	75-00-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloroform	67-66-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.80E+01	Tier II SCV from Suter and Tsao (1996) in EPA (1999)
Chloromethane	74-87-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloropentafluoroethane	76-15-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
cis-1,2-Dichloroethene	156-59-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
cis-1,3-Dichloropropene	10061-01-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyanogen bromide	506-68-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyanogen chloride	506-77-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichlorodifluoromethane	75-71-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichlorofluoromethane	75-43-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-6 Derivation of Surface Water Toxicity Reference Values (TRVs) from Data for Sensitive Species for Exposure of Chinook Salmon and Other Salmonids to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Dichloromethane	75-09-2	Chronic	No data	Aquatic biota	2.20E+03	No data	No data	Tier II SCV	2.20E+03	Tier II SCV in Suter and Tsao (1996)
Difluorodibromomethane	75-61-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexafluoroacetone	684-16-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Iodomethane	74-88-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylene bromide	74-95-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachloroethane	76-01-7	Chronic	LOEL	Aquatic biota	3.90E+02	1.0E+00	1.0E-01	Mortality	3.90E+01	EPA (1987)
trans-1,2-Dichloroethylene	156-60-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
trans-1,3-Dichloropropene	10061-02-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichloroacetic acid	76-03-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichlorofluoroethane	27154-33-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichlorofluoromethane	75-69-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trifluorobromomethane	75-63-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dioxin and Furan Compounds (PCDDs/PCDFs)										
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	Chronic	LOEL	*Onchorynchus mykiss*	3.80E-05	1.0E+00	1.0E-01	Mortality	3.80E-06	Mehrle and others (1988) in EPA (1999)
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzofuran	132-64-9	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	3.70E+00	Tier II SCV in Suter and Tsao (1996)
Octachlorodibenzo(p)dioxin	3268-87-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Octachlorodibenzofuran	39001-02-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Total dioxins and dibenzofurans	No CAS #	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Polychlorinated Biphenyls (PCBs)										
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-6 Derivation of Surface Water Toxicity Reference Values (TRVs) from Data for Sensitive Species for Exposure of Chinook Salmon and Other Salmonids to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Polychlorinated biphenyls (PCBs)[c]	1336-36-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.40E-01	Tier II SCV in Suter and Tsao (1996)
Phthalates										
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	3.00E+00	Tier II SCV from Suter and Tsao (1996) in EPA (1999)
Butylbenzyl phthalate	85-68-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.90E+01	Tier II SCV in Suter and Tsao (1996)
Dibutyl phthalate	84-74-2	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	3.50E+01	Tier II SCV in Suter and Tsao (1996)
Diethyl phthalate	84-66-2	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.10E+02	Tier II SCV in Suter and Tsao (1996)
Dimethyl phthalate	131-11-3	Chronic	LOAEL	*Onchorynchus mykiss*	4.00E-03	1.0E+00	1.0E-01	No data	4.00E-04	Suter and Tsao (1996)
n-Dioctyl phthalate	117-84-0	Chronic	LOEL	*Daphnia magna*	3.20E+02	1.0E+00	1.0E+00	Mortality	3.20E+02	McCarthy and Whitmore (1985) in EPA (1999)
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)										
2-Chloronaphthalene	91-58-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Methyl naphthalene	91-57-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
5-Nitroacenaphthene	602-87-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acenaphthene	83-32-9	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.30E+01	Chronic NAWQC in Suter and Tsao (1996)
Acenaphthylene	208-96-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Anthracene	120-12-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	7.30E-01	Tier II SCV in Suter and Tsao (1996)
Fluorene	86-73-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	3.90E+00	Tier II SCV in Suter and Tsao (1996)
Indene	95-13-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Naphthalene	91-20-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.20E+01	Tier II SCV in Suter and Tsao (1996)
Phenanthrene	85-01-8	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	6.30E+00	Chronic NAWQC in Suter and Tsao (1996)
Pyrene	129-00-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)										
3-Methylcholanthrene	56-49-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
5-Methylchrysene	3697-24-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-6 Derivation of Surface Water Toxicity Reference Values (TRVs) from Data for Sensitive Species for Exposure of Chinook Salmon and Other Salmonids to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Benzo[a]anthracene	56-55-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.70E-02	Tier II SCV from Suter and Tsao (1996) in EPA (1999)
Benzo[a]pyrene	50-32-8	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.40E-02	Tier II SCV from EPA (1996) in EPA (1999)
Benzo[a,i]pyrene	191-30-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[b]fluoranthene	205-99-2	NA	NA	NA	NA	NA	NA	NA	2.70E-02	TRV for benzo[a]anthracene used as surrogate; EPA (1999)
Benzo[e]pyrene	192-97-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[g,h,i]perylene	191-24-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[j]fluoranthene	205-82-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzo[k]fluoranthene	207-08-9	NA	NA	NA	NA	NA	NA	NA	2.70E-02	TRV for benzo[a]anthracene used as surrogate; EPA (1999)
Chrysene	218-01-9	NA	NA	NA	NA	NA	NA	NA	2.70E-02	TRV for benzo[a]anthracene used as surrogate; EPA (1999)
Dibenz[a,h]acridine	226-36-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenz[a,h]anthracene	53-70-3	NA	NA	NA	NA	NA	NA	NA	2.70E-02	TRV for benzo[a]anthracene used as surrogate; EPA (1999)
Dibenz[a,j]acridine	224-42-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,e]fluoranthene	5385-75-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,e]pyrene	192-65-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,h]fluoranthene	No CAS #	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,h]pyrene	189-64-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibenzo[a,i]pyrene	189-55-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Fluoranthene	206-44-0	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	6.16E+00	Chronic NAWQC in Suter and Tsao (1996)
Hexachloronaphthalene	1335-87-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Indeno[1,2,3-cd]pyrene	193-39-5	No data	No data	No data	No data	No data	No data	No data	2.70E-02	TRV for benzo[a]anthracene used as surrogate; EPA (1999)
Octachloronaphthalene	2234-13-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachloronaphthalene	1321-64-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tetrachloronaphthalene	1335-88-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trichloronaphthalene	1321-65-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Light Substituted Benzene Compounds (molecular weight <200 g/mole)										
1,2,3-Trichlorobenzene	87-61-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2,4-Trichlorobenzene	120-82-1	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.10E+02	Tier II SCV in Suter and Tsao (1996)
1,2,4-Trimethyl benzene	95-63-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-6 Derivation of Surface Water Toxicity Reference Values (TRVs) from Data for Sensitive Species for Exposure of Chinook Salmon and Other Salmonids to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
1,2-Dichlorobenzene	95-50-1	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.40E+01	Tier II SCV in Suter and Tsao (1996)
1,3,5-Trimethyl benzene	108-67-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3-Dichlorobenzene	541-73-1	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	7.10E+01	Tier II SCV in Suter and Tsao (1996)
1,3-Dinitrobenzene	99-65-0	Subchronic	NOEC	*Selanastrum capricornutum*	2.60E+02	1.0E-01	1.0E+00	Reduced growth	2.60E+01	van der Schalie (1983) in EPA (1999)
1,4-Dichlorobenzene	106-46-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.50E+01	Tier II SCV in Suter and Tsao (1996)
1,4-Dinitrobenzene	100-25-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4,5-Trichlorophenol	95-95-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4,6-Trichlorophenol	88-06-2	Acute	LOEL	Aquatic biota	9.70E+02	1.0E-01	1.0E-01	Mortality	9.70E+00	EPA (1987)
2,4-Dichlorophenol	120-83-2	Chronic	LOEL	Aquatic biota	3.65E+02	1.0E+00	1.0E-01	Mortality	3.65E+01	EPA (1987)
2,4-Dimethylphenol	105-67-9	Acute	LOEL	Aquatic biota	2.12E+03	1.0E-01	1.0E-01	Mortality	2.12E+01	EPA (1987)
2,4-Dinitrophenol	51-28-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-Dinitrotoluene	121-14-2	Chronic	LOEL	Aquatic biota	2.30E+02	1.0E+00	1.0E-01	Mortality	2.30E+01	EPA (1987c) in EPA (1999)
2,6-Dinitrotoluene	606-20-2	Chronic	NOEC	*Daphnia magna*	6.00E+01	1.0E+00	1.0E+00	Mortality	6.00E+01	Kuhn and others (1989) in EPA (1999)
2-Chlorophenol	95-57-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chlorotoluene	95-49-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Nitrophenol	88-75-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,6-Dinitro-o-cresol	534-52-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Chlorotoluene	106-43-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Nitrophenol	100-02-7	Acute	LOAEL	*Onchorynchus mykiss*	6.31E+00	1.0E-01	1.0E-01	No data	6.31E-02	AQUIRE (2002)
alpha-Methylstyrene	98-83-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Aniline	62-53-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzotrichloride	98-07-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzyl chloride	100-44-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bromobenzene	108-86-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorobenzene	108-90-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	6.40E+01	Tier II SCV in Suter and Tsao (1996)
Cumene	98-82-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
m-Cresol	108-39-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
n-Butyl benzene	104-51-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrobenzene	98-95-3	Acute	LOEL	Aquatic biota	2.70E+04	1.0E-01	1.0E-01	Mortality	2.70E+02	EPA (1987c) in EPA (1999)
n-Propyl benzene	103-65-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Cresol	95-48-7	Acute	LOAEL	*Onchorynchus mykiss*	6.31E+00	1.0E-01	1.0E-01	No data	6.31E-02	AQUIRE (2002)
o-Dinitrobenzene	528-29-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Nitroaniline	88-74-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-6 Derivation of Surface Water Toxicity Reference Values (TRVs) from Data for Sensitive Species for Exposure of Chinook Salmon and Other Salmonids to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
o-Toluidine	95-53-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Chloroaniline	106-47-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Cresol	106-44-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phenol	108-95-2	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.10E+02	Chronic NAWQC in Suter and Tsao (1996)
p-Nitrochlorobenzene	100-00-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Toluidine	106-49-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
sec-Butyl benzene	135-98-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
tert-Butyl benzene	98-06-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Toluene-2,6-diamine	823-40-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trimethyl benzene	25551-13-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Other Light Semivolatile Compounds (molecular weight <200 g/mole)										
1,1'-Biphenyl	92-52-4	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.40E+01	Tier II SCV in Suter and Tsao (1996)
1,1-Dimethylhydrazine	57-14-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Dimethylhydrazine	540-73-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,2-Diphenylhydrazine	122-66-7	Acute	LOEL	Aquatic biota	2.70E+02	1.0E-01	1.0E-01	Mortality	2.70E+00	EPA (1987)
1,3-Propane sultone	1120-71-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-Toluene diisocyanate	584-84-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Chloroacetophenone	532-27-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Propenoic acid	79-10-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,4'-Methylenedianiline	101-77-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Acetophenone	98-86-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Benzoic acid	65-85-0	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	4.20E+01	Tier II SCV in Suter and Tsao (1996)
Bis(2-chloroethoxy)methane	111-91-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bis(2-chloroethyl) ether	111-44-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorocyclopentadiene	41851-50-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Cyclohexanol	108-93-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloroisopropyl ether	108-60-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloromethyl ether	542-88-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dichloropentadiene	61626-71-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dimethyl sulfate	77-78-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dimethylaniline	121-69-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
di-n-Propylnitrosamine	621-64-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Diphenyl ether	101-84-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Epichlorohydrin	106-89-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl carbamate (Urethane)	51-79-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethyl methanesulfonate	62-50-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene dibromide	106-93-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene glycol	107-21-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene glycol monobutyl ether	111-76-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ethylene glycol monoethyl ether acetate	111-15-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-6 Derivation of Surface Water Toxicity Reference Values (TRVs) from Data for Sensitive Species for Exposure of Chinook Salmon and Other Salmonids to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Ethylene thiourea	96-45-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Furfural	98-01-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Maleic hydrazide	123-33-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Malononitrile	109-77-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methyl styrene (mixed isomers)	25013-15-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methylhydrazine	60-34-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N,N-Diphenylamine	122-39-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitric acid, propyl ester	627-13-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N-Nitrosodi-n-butylamine	924-16-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N-Nitrosomorpholine	59-89-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
N-Nitroso-N,N-dimethylamine	62-75-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
o-Anisidine	90-04-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Oxalic acid	144-62-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phthalic anhydride	85-44-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
p-Phthalic acid	100-21-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pyridine	110-86-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Quinoline	91-22-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Quinone	106-51-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Safrole	94-59-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tetrahydrofuran	109-99-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)										
1,2,4,5-Tetrachlorobenzene	95-94-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
1,3,5-Trinitrobenzene	99-35-4	Chronic	LOAEL	*Onchorynchus mykiss*	1.30E+01	1.0E+00	1.0E-01	No data	1.30E+00	Suter and Tsao (1996)
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2-sec-Butyl-4,6-dinitrophenol	88-85-7	Chronic	LOAEL	*Pimphales promelas*	1.30E-01	1.0E+00	1.0E-01	No data	1.30E-02	Suter and Tsao (1996)
3,3'-Dichlorobenzidine	91-94-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
3,3'-Dimethoxybenzidine	119-90-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4-Bromophenylphenyl ether	101-55-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.50E+00	Tier II SCV in Suter and Tsao (1996)
Ammonium perfluorooctanoate	3825-26-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Azobenzene	103-33-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	96-69-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Captan	133-06-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chlorobenzilate	510-15-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dibutylphosphate	107-66-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Dimethyl aminoazobenzene	60-11-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hexachlorobenzene	118-74-1	Chronic	No data	No data	3.68E+00	No data	No data	No data	3.68E+00	EPA (1987c) in EPA (1999)
Hexachlorobutadiene	87-68-3	Chronic	LOEL	No data	9.30E+00	1.0E+00	1.0E-01	No data	9.30E-01	EPA (1987c) in EPA (1999)

Table C3-6 Derivation of Surface Water Toxicity Reference Values (TRVs) from Data for Sensitive Species for Exposure of Chinook Salmon and Other Salmonids to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Hexachlorocyclopentadiene	77-47-4	Chronic	LOEL	Aquatic biota	5.20E+00	1.0E+00	1.0E-01	Mortality	5.20E-01	EPA (1987c) in EPA (1999)
Hexachloroethane	67-72-1	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.20E+01	Tier II SCV in Suter and Tsao (1996)
Hexachlorophene	70-30-4	Subchronic	NOEC	*Pimphales promelas*	8.80E+00	1.0E-01	1.0E+00	Mortality	8.80E-01	Call and others (1989) in EPA (1999)
Hexamethylene-1,5-diisocyanate	822-06-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Mirex	2385-85-5	No data	No data	No data	1.00E-03	No data	No data	Freshwater criterion	1.00E-03	EPA (1987)
Nitrofen	1836-75-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pentachlorobenzene	608-93-5	Chronic	No data	No data	4.70E-01	No data	No data	No data	4.70E-01	EPA (1996) in EPA (1999)
Pentachloronitrobenzene	82-68-8	Acute	LC50	*Cyprinus carpio*	1.00E+03	1.0E-01	1.0E-01	Mortality	1.00E+01	Hashimoto and Nishiuchi (1981) in EPA (1999)
Pentachlorophenol	87-86-5	Chronic	EC50	*Onchohynchus nerka*	1.74E+00	No data	Eq. 2	Growth	5.59E-02	AQUIRE (2002)
Picric acid	88-89-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Pronamide	23950-58-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Strychnine	57-24-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Terphenyls	26140-60-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Tributyl phosphate	126-73-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Trifluralin	1582-09-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Triphenylamine	603-34-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Herbicides and Organochlorinated Pesticides										
2,4,5-T	93-76-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
2,4-D and esters	94-75-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
4,4'-DDD	72-54-8	Acute	LOAEL	*Onchorynchus mykiss*	2.00E-02	1.0E-01	1.0E-01	Mortality	2.00E-04	Suter and Tsao (1996)
4,4'-DDE	72-55-9	Acute	LOEL	No data	1.05E+03	1.0E-01	1.0E-01	No data	1.05E+01	EPA (1987c) in EPA (1999)
4,4'-DDT	50-29-3	Chronic	No data	Aquatic biota	8.00E-03	No data	No data	Sensitive species EC20	8.00E-03	Suter and Tsao (1996)
Aldrin	309-00-2	Chronic	No data	Aquatic biota	No data	No data	No data	Toxic effects	3.00E+00	EPA (1987)
alpha-BHC	319-84-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.20E+00	Tier II SCV in Suter and Tsao (1996)
beta-BHC	319-85-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.20E+00	Tier II SCV in Suter and Tsao (1996)
Chlordane	57-74-9	Chronic	LOAEL	Brook trout	2.00E-01	1.0E+00	1.0E-01	Mortality	2.00E-02	Suter and Tsao (1996) Table C-1
delta-BHC	319-86-8	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.20E+00	Tier II SCV in Suter and Tsao (1996)
Dieldrin	60-57-1	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	6.20E-02	Chronic NAWQC in Suter and Tsao (1996)

Table C3-6 Derivation of Surface Water Toxicity Reference Values (TRVs) from Data for Sensitive Species for Exposure of Chinook Salmon and Other Salmonids to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Endothall	145-73-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Endrin	72-20-8	Chronic	No data	No data	6.10E-02	No data	No data	Chronic NAWQC	6.10E-02	Suter and Tsao (1996)
gamma-BHC (Lindane)	58-89-9	Chronic	No data	Aquatic biota	8.00E-02	No data	No data	Chronic NAWQC	8.00E-02	Suter and Tsao (1996)
Heptachlor	76-44-8	Chronic	No data	Aquatic biota	3.80E-03	No data	No data	No data	3.80E-03	EPA (1987c) in EPA (1999)
Isodrin	465-73-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Methoxychlor	72-43-5	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.90E-02	Tier II SCV in Suter and Tsao (1996)
Silvex (2,4,5-TP)	93-72-1	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Toxaphene	8001-35-2	Chronic	LOAEL	*Salmo trutta*	2.00E-01	1.0E+00	1.0E-01	No data	1.00E-03	Suter and Tsao (1996)
Inorganic Chemicals and Compounds					(mg/L)				(mg/L)	
	Metals									
Aluminum	7429-90-5	Chronic	EC20	Aquatic biota	7.50E-02	No data	No data	Sensitive species EC20	7.50E-02	Suter and Tsao (1996)
Antimony	7440-36-0	Chronic	LC50	Aquatic biota	Various	No data	No data	No data	3.00E-02	Proposed chronic criterion from EPA (1987c) in EPA (1999)
Arsenic	7440-38-2	Chronic	EC20	Aquatic biota	5.50E-02	No data	No data	Sensitive species EC20	5.50E-02	Suter and Tsao (1996)
Barium	7440-39-3	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	4.00E-03	Tier II SCV in Suter and Tsao (1996)
Beryllium	7440-41-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	6.60E-04	Tier II SCV from Suter and Tsao (1996) in EPA (1999)
Bismuth	7440-69-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Boron	7440-42-8	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.60E-03	Tier II SCV in Suter and Tsao (1996)
Cadmium	7440-43-9	Chronic	EC20	Aquatic biota	1.30E-05	No data	No data	Sensitive species EC20	1.30E-05	Suter and Tsao (1996)
Calcium	7440-70-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chromium[d]	18540-29-9	Chronic	EC20	Aquatic biota	2.66E-04	No data	No data	Sensitive species EC20	2.66E-04	Suter and Tsao (1996)
Cobalt	7440-48-4	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.30E-02	Tier II SCV in Suter and Tsao (1996)
Copper	7440-50-8	Chronic	EC20	Aquatic biota	2.60E-04	No data	No data	Sensitive species EC20	2.60E-04	Suter and Tsao (1996)
Iron	7439-89-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.00E+00	Tier II SCV in Suter and Tsao (1996)
Lead	7439-92-1	Chronic	EC20	Aquatic biota	3.50E-04	No data	No data	Sensitive species EC20	3.50E-04	Suter and Tsao (1996)
Lithium	7439-93-2	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.40E-02	Tier II SCV in Suter and Tsao (1996)

Table C3-6 Derivation of Surface Water Toxicity Reference Values (TRVs) from Data for Sensitive Species for Exposure of Chinook Salmon and Other Salmonids to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Magnesium	7439-95-4	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Manganese	7439-96-5	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.20E-01	Tier II SCV in Suter and Tsao (1996)
Mercury	7439-97-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Mercury - Hg+2	7487-94-7	Chronic	EC20	Aquatic biota	1.80E-04	No data	No data	Sensitive species EC20	1.80E-04	Suter and Tsao (1996)
Methylmercury	22967-92-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.80E-06	Tier II SCV from Suter and Tsao (1996) in EPA (1999)
Molybdenum	7439-98-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	3.70E-01	Tier II SCV in Suter and Tsao (1996)
Nickel	7440-02-0	Chronic	EC20	Aquatic biota	1.10E-02	No data	No data	Sensitive species EC20	1.10E-02	Suter and Tsao (1996)
Potassium	7440-09-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Rhodium	7440-16-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Selenium	7782-49-2	Chronic	EC20	Aquatic biota	2.60E-03	No data	No data	Sensitive species EC20	2.60E-03	Suter and Tsao (1996)
Silicon	7440-21-3	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Silver	7440-22-4	Chronic	No data	*Onchorynchus mykiss*	1.20E-04	No data	No data	No data	1.20E-04	Proposed Chronic Criterion from EPA (1987c) in EPA (1999)
Sodium	7440-23-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Strontium	7440-24-6	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.50E+00	Tier II SCV in Suter and Tsao (1996)
Tantalum	7440-25-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Thallium	7440-28-0	Chronic	LOEL	No data	4.00E-02	No data	1.0E-01	No data	4.00E-03	EPA (1987c) in EPA (1999)
Tin	7440-31-5	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	7.30E-02	Tier II SCV in Suter and Tsao (1996)
Tungsten	7440-33-7	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Uranium	7440-61-1	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.60E-03	Tier II SCV in Suter and Tsao (1996)
Vanadium	7440-62-2	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	2.00E-02	Tier II SCV in Suter and Tsao (1996)
Yttrium	7440-65-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Zinc	7440-66-6	Chronic	EC20	Aquatic biota	2.10E-02	No data	No data	Sensitive species EC20	2.10E-02	Suter and Tsao (1996)
Zirconium	7440-67-7	Chronic	LC50	Aquatic biota	Various	No data	No data	Mortality	1.70E-02	Tier II SCV in Suter and Tsao (1996)
	Non-metals and Anions									
Ammonia/Ammonium	7664-41-7	Chronic	No data	*Onchorynchus gorbuscha*	1.70E-03	No data	No data	LCV	1.70E-03	Rice and Bailey (1980) in Suter and Tsao (1996)
Bromide	24959-67-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Chloride	16887-00-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data

Table C3-6 Derivation of Surface Water Toxicity Reference Values (TRVs) from Data for Sensitive Species for Exposure of Chinook Salmon and Other Salmonids to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)[a]	Endpoint conversion factor (ECF)[a]	Effect	TRV (EC × DCF × ECF)	Source[b]
Cyanide	57-12-5	Chronic	EC20	Aquatic biota	1.17E-03	No data	No data	Sensitive species EC20	1.17E-03	Suter and Tsao (1996)
Fluoride	16984-48-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Hydroxide	14280-30-9	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Iodine	7553-56-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrate	14797-55-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrite	14797-65-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phosphate	14265-44-2	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Phosphorus	7723-14-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Sulfate	14808-79-8	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Total sulfur	63705-05-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Criteria Pollutants										
Carbon monoxide	630-08-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Nitrogen dioxide	10102-44-0	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Ozone	10028-15-6	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Particulate matter	No CAS #	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Sulfur dioxide	7446-09-5	No data	No data	No data	No data	No data	No data	No data	No TRV	No data
Radionuclides										
All radionuclides combined (rad/d)[c]	No CAS #	Chronic	Adverse effects	Aquatic biota	NA	NA	NA	Population effects	1.00E+00	NCRP (1991)

Table C3-6 Derivation of Surface Water Toxicity Reference Values (TRVs) from Data for Sensitive Species for Exposure of Chinook Salmon and Other Salmonids to COPCs and ROPCs

Notes/Sources

No data = No data available.
NA = Not applicable.
CAS = Chemical Abstracts Service.
EC = Concentration that caused the reported effect.
DCF = Duration conversion factor; 1 if chronic, 0.1 if subchronic (Sample and others 1996).
ECF = Endpoint conversion factor; 1 if NOAEL, 0.1 if LOAEL (Sample and others 1996).
TRV = Toxicity reference value.
Tier II SCV = Secondary Chronic Value calculated according to Great Lakes Initiative methods.
Chronic NAWQC = Chronic National Ambient Water Quality Criterion.
LC50 = Concentration lethal to 50 % of tested individuals.
LC100 = Concentration lethal to 100 % of tested individuals.
EC20 = Concentration at which an effect was observed in 20 % of tested individuals.
EC50 = Concentration at which an effect was observed in 50 % of tested individuals.
LOAEL = Lowest observed adverse effect level.
LOEL = Lowest exposure level at which an effect was observed.
NOEC = Highest concentration at which an effect was not observed.
LCV = Lowest Chronic Value.

[a] Methods to calculate NAWQC and Tier II SCV values are presented in Suter and Tsao (1996).

[b] Order of preference is: sensitive species EC20 from Suter and Tsao (1996), then other published data in which salmonid TRVs are lower than general aquatic TRVs, then EPA (1999), then NAWQC, then Tier II chronic value, then other published data.

[c] Data for Aroclor-1254 used as representative of polychlorinated biphenyl mixtures.

[d] Values for hexavalent chromium, which is more toxic than trivalent chromium.

[e] TRV is not applicable to single radionuclides. Combined external and internal radiation exposure for aquatic biota from all radionuclides combined cannot exceed 1 rad/d.

Table C3-7 Derivation of Sediment Toxicity Reference Values (TRVs) for Exposure of Sediment-Dwelling Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
Organic Compounds									(µg/kg)	
Aromatic Halogenated Hydrocarbons										
2,3,4,6-Tetrachlorophenol	58-90-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
4-Chloro-3-methylphenol	59-50-7	Chronic	NOAEL	Aquatic biota	3.00E-01 µg/L	NA	371 × 0.04 (Koc × TOC)	Not specified	4.45E+00	EqP[a] method (Jones and others 1997)
Aromatic Nonhalogenated Hydrocarbons										
2-Nitrotoluene	88-72-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
4-Nitrobiphenyl	92-93-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Benzaldehyde	100-52-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Benzene	71-43-2	Chronic	NOAEL	Aquatic biota	1.30E+02 µg/L	NA	62 × 0.04 (Koc × TOC)	Not specified	3.22E+02	EqP[a] method (Jones and others 1997)
Benzyl alcohol	100-51-6	Chronic	NOAEL	Aquatic biota	8.60E+00 µg/L	NA	10.2 × 0.04 (Koc × TOC)	Not specified	3.51E+00	EqP[a] method (Jones and others 1997)
Ethyl benzene	100-41-4	Chronic	NOAEL	Aquatic biota	7.30E+00 µg/L	NA	204 × 0.04 (Koc × TOC)	Not specified	5.96E+01	EqP[a] method (Jones and others 1997)
m-Xylene	108-38-3	Chronic	NOAEL	Aquatic biota	1.80E+00 µg/L	NA	196 × 0.04 (Koc × TOC)	Not specified	1.41E+01	EqP[a] method (Jones and others 1997)
o-Xylene	95-47-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
p-Xylene	106-42-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Styrene	100-42-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Toluene	108-88-3	Chronic	NOAEL	Aquatic biota	9.80E+00 µg/L	NA	140 × 0.04 (Koc × TOC)	Not specified	5.49E+01	EqP[a] method (Jones and others 1997)
Non-aromatic Nonhalogenated Hydrocarbons										
1,2-Epoxybutane	106-88-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,3-Butadiene	106-99-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,4-Dioxane	123-91-1	Chronic	NOAEL	Aquatic biota	6.21E+04 µg/L	NA	0.876 × 0.04 (Koc × TOC)	Not specified	2.17E+03	EqP[a] method (EPA 1999)
1-Methylpropyl alcohol	78-92-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1-Nitropropane	108-03-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,2,4-Trimethylpentane	540-84-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Butanone	78-93-3	Chronic	NOAEL	Aquatic biota	1.40E+04 µg/L	NA	2.34 × 0.04 (Koc × TOC)	Not specified	1.31E+03	EqP[a] method (Jones and others 1997)
2-Butenaldehyde (2-Butenal)	4170-30-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Ethoxyethanol	110-80-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Heptanone	110-43-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Hexanone	591-78-6	Chronic	NOAEL	Aquatic biota	9.90E+01 µg/L	NA	2.13 × 0.04 (Koc × TOC)	Not specified	8.42E+00	EqP[a] method (Jones and others 1997)
2-Methoxyethanol	109-86-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Methyl-2-propanol	75-65-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Methyl-2-propenenitrile	126-98-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Methylaziridine	75-55-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data

Table C3-7 Derivation of Sediment Toxicity Reference Values (TRVs) for Exposure of Sediment-Dwelling Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
2-Methylpropyl alcohol	78-83-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Pentanone	107-87-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Propanone (Acetone)	67-64-1	Chronic	NOAEL	Aquatic biota	1.50E+03 µg/L	NA	0.951 × 0.04 (Koc × TOC)	Not specified	5.71E+01	EqP[a] method (Jones and others 1997)
2-Propene-1-ol	107-18-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Propyl alcohol	67-63-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
3-Heptanone	106-35-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
3-Methyl-1-butanol	123-51-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
3-Methyl-2-butanone	563-80-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
3-Pentanone	96-22-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
4-Heptanone	123-19-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
4-Methyl-2-pentanone	108-10-1	Chronic	NOAEL	Aquatic biota	1.70E+02 µg/L	NA	12 × 0.04 (Koc × TOC)	Not specified	8.16E+01	EqP[a] method (Jones and others 1997)
4-Methyl-3-penten-2-one	141-79-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
5-Methyl-2-hexanone	110-12-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Acetaldehyde	75-07-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Acetamide	60-35-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Acetic acid	64-19-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Acetic acid ethyl ester	141-78-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Acetic acid n-butyl ester	123-86-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Acetonitrile	75-05-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Acrolein	107-02-8	Chronic	NOAEL	Aquatic biota	2.10E+00 µg/L	NA	1.39 × 0.04 (Koc × TOC)	Not specified	1.17E-01	EqP[a] method (Jones and others 1997)
Acrylonitrile	107-13-1	Chronic	NOAEL	Aquatic biota	2.60E+02 µg/L	NA	2.22 × 0.04 (Koc × TOC)	Not specified	2.31E+01	EqP[a] method (EPA 1999)
Bis(isopropyl)ether	108-20-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Butane	106-97-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Carbon disulfide	75-15-0	Chronic	NOAEL	Aquatic biota	9.20E-01 µg/L	NA	51.4 × 0.04 (Koc × TOC)	Not specified	1.89E+00	EqP[a] method (Jones and others 1997)
Cyanogen	460-19-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Cyclohexane	110-82-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Cyclohexanone	108-94-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Cyclohexene	110-83-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Cyclopentane	287-92-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Ethyl alcohol	64-17-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Ethyl ether	60-29-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Ethyl methacrylate	97-63-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Formaldehyde	50-00-0	Chronic	NOAEL	Aquatic biota	4.96E+01 µg/L	NA	2.62 × 0.04 (Koc × TOC)	Not specified	5.20E+00	EqP[a] method (EPA 1999)
Formamide	75-12-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Formic acid	64-18-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Formic acid, methyl ester	107-31-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data

Table C3-7 Derivation of Sediment Toxicity Reference Values (TRVs) for Exposure of Sediment-Dwelling Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
Glycidylaldehyde	765-34-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Methyl acetate	79-20-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Methyl alcohol	67-56-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Methyl isocyanate	624-83-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Methyl methacrylate	80-62-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Methyl tert-butyl ether	1634-04-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Methylacetylene	74-99-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Methylcyclohexane	108-87-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
N,N-Dimethylacetamide	127-19-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
n-Butyl alcohol	71-36-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
n-Heptane	142-82-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
n-Hexane	110-54-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Nitromethane	75-52-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
n-Nonane	111-84-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
n-Octane	111-65-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
n-Pentane	109-66-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
n-Propionaldehyde	123-38-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
n-Propyl alcohol	71-23-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
n-Valeraldehyde	110-62-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Oxirane	75-21-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
p-Cymene	99-87-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Phosgene	75-44-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Propargyl alcohol	107-19-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Propionic acid	79-09-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Propionitrile	107-12-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Propylene glycol monomethyl ether	107-98-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
p-tert-Butyltoluene	98-51-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Triethylamine	121-44-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Trimethylamine	75-50-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Vinyl acetate	108-05-4	Chronic	NOAEL	Aquatic biota	1.60E+01 µg/L	NA	4.97 × 0.04 (Koc × TOC)	Not specified	3.18E+00	EqP[a] method (Jones and others 1997)
Non-aromatic Halogenated Hydrocarbons										
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,1,1,2-Tetrachloroethane	630-20-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,1,1-Trichloroethane	71-55-6	Chronic	NOAEL	Aquatic biota	1.10E+01 µg/L	NA	135,000 × 0.04 (Koc × TOC)	Not specified	5.94E+04	EqP[a] method (Jones and others 1997)
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,1,2,2-Tetrachloroethane	79-34-5	Chronic	NOAEL	Aquatic biota	6.10E+02 µg/L	NA	79 × 0.04 (Koc × TOC)	Not specified	1.93E+03	EqP[a] method (Jones and others 1997)
1,1,2,2-Tetrachloroethene	127-18-4	Chronic	NOAEL	Aquatic biota	9.80E+01 µg/L	NA	265 × 0.04 (Koc × TOC)	Not specified	1.04E+03	EqP[a] method (Jones and others 1997)

Table C3-7 Derivation of Sediment Toxicity Reference Values (TRVs) for Exposure of Sediment-Dwelling Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
1,1,2-Trichloroethane	79-00-5	Chronic	NOAEL	Aquatic biota	1.20E+03 µg/L	NA	75 × 0.04 (Koc × TOC)	Not specified	3.60E+03	EqP[a] method (Jones and others 1997)
1,1,2-Trichloroethylene	79-01-6	Chronic	NOAEL	Aquatic biota	4.70E+01 µg/L	NA	94 × 0.04 (Koc × TOC)	Not specified	1.77E+02	EqP[a] method (Jones and others 1997)
1,1-Dichloroethane	75-34-3	Chronic	NOAEL	Aquatic biota	4.70E+01 µg/L	NA	53 × 0.04 (Koc × TOC)	Not specified	9.96E+01	EqP[a] method (Jones and others 1997)
1,1-Dichloroethene	75-35-4	Chronic	NOAEL	Aquatic biota	2.50E+01 µg/L	NA	65 × 0.04 (Koc × TOC)	Not specified	6.50E+01	EqP[a] method (Jones and others 1997)
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2,3-Trichloropropane	96-18-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2-Dibromo-3-chloropropane	96-12-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2-Dichloroethane	107-06-2	Chronic	NOAEL	Aquatic biota	9.10E+02 µg/L	NA	19.6 × 0.04 (Koc × TOC)	Not specified	7.13E+02	EqP[a] method (Jones and others 1997)
1,2-Dichloroethylene	540-59-0	Chronic	NOAEL	Aquatic biota	5.90E+02 µg/L	NA	2.87 × 0.04 (Koc × TOC)	Not specified	6.78E+01	EqP[a] method (Jones and others 1997)
1,2-Dichloropropane	78-87-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,3-Dichloropropene	542-75-6	Chronic	NOAEL	Aquatic biota	5.50E-02 µg/L	NA	27 × 0.04 (Koc × TOC)	Not specified	5.94E-02	EqP[a] method (Jones and others 1997)
1,4-Dichloro-2-butene	764-41-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1-Chloroethene	75-01-4	Chronic	NOAEL	Aquatic biota	3.88E+03 µg/L	NA	11.1 × 0.04 (Koc × TOC)	Not specified	1.72E+03	EqP[a] method (EPA 1999)
2,2-Dichloropropionic acid	75-99-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Chloropropane	75-29-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
3-Chloropropene (Allyl chloride)	107-05-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Bromochloromethane	74-97-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Bromodichloromethane	75-27-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Bromoethene	593-60-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Bromoform	75-25-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Bromomethane	74-83-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Carbon tetrachloride	56-23-5	Chronic	NOAEL	Aquatic biota	9.80E+00 µg/L	NA	152 × 0.04 (Koc × TOC)	Not specified	5.96E+01	EqP[a] method (Jones and others 1997)
Chlorodibromomethane	124-48-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Chlorodifluoromethane	75-45-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Chloroethane	75-00-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Chloroform	67-66-3	Chronic	NOAEL	Aquatic biota	2.80E+01 µg/L	NA	53.0 × 0.04 (Koc × TOC)	Not specified	5.94E+01	EqP[a] method (EPA 1999)
Chloromethane	74-87-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Chloropentafluoroethane	76-15-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
cis-1,2-Dichloroethene	156-59-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
cis-1,3-Dichloropropene	10061-01-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data

Table C3-7 Derivation of Sediment Toxicity Reference Values (TRVs) for Exposure of Sediment-Dwelling Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
Cyanogen bromide	506-68-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Cyanogen chloride	506-77-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dichlorodifluoromethane	75-71-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dichlorofluoromethane	75-43-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dichloromethane	75-09-2	Chronic	NOAEL	Aquatic biota	2.20E+03 µg/L	NA	10 × 0.04 (Koc × TOC)	Not specified	8.80E+02	EqP[a] method (Jones and others 1997)
Difluorodibromomethane	75-61-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Hexafluoroacetone	684-16-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Iodomethane	74-88-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Methylene bromide	74-95-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Pentachloroethane	76-01-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
trans-1,2-Dichloroethylene	156-60-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
trans-1,3-Dichloropropene	10061-02-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Trichloroacetic acid	76-03-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Trichlorofluoroethane	27154-33-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Trichlorofluoromethane	75-69-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Trifluorobromomethane	75-63-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dioxin and Furan Compounds (PCDDs/PCDFs)										
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	Chronic	NOAEL	Aquatic biota	3.80E-06 µg/L	NA	2.69E+06 × 0.04 (Koc × TOC)	Not specified	4.10E-01	EqP[a] method (EPA 1999)
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dibenzofuran	132-64-9	Chronic	No data	*Hyalella azteca*	3.20E+04 µg/kg	NA	No data	AET	3.20E+04	Ecology (1994) in EPA (1999)
Octachlorodibenzo(p)dioxin	3268-87-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Octachlorodibenzofuran	39001-02-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Total dioxins and dibenzofurans	No CAS #	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Polychlorinated Biphenyls (PCBs)										
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data

Table C3-7 Derivation of Sediment Toxicity Reference Values (TRVs) for Exposure of Sediment-Dwelling Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Polychlorinated biphenyls (PCBs)[b]	1336-36-3	Chronic	No data	Sediment biota	7.00E+01 µg/kg	NA	No data	LEL	7.00E+01	Persaud and others (1993)
Phthalates										
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	Chronic	NOAEL	Aquatic biota	3.00E+00 µg/L	NA	111,000 × 0.04 (Koc × TOC)	Not specified	1.33E+04	EqP[a] method (EPA 1999)
Butylbenzyl phthalate	85-68-7	Chronic	NOAEL	Aquatic biota	1.90+01 µg/L	NA	13,700 × 0.04 (Koc × TOC)	Not specified	1.04E+04	EqP[a] method (Jones and others 1997)
Dibutyl phthalate	84-74-2	Chronic	NOAEL	Aquatic biota	3.50+01 µg/L	NA	1570 × 0.04 (Koc × TOC)	Not specified	2.20E+03	EqP[a] method (EPA 1999)
Diethyl phthalate	84-66-2	Chronic	NOAEL	Aquatic biota	2.10E+02 µg/L	NA	82 × 0.04 (Koc × TOC)	Not specified	6.89E+02	EqP[a] method (Jones and others 1997)
Dimethyl phthalate	131-11-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
n-Dioctyl phthalate	117-84-0	Chronic	NOAEL	Aquatic biota	3.20E+02 µg/L	NA	9.03E+08 × 0.04 (Koc × TOC)	Not specified	1.16E+10	EqP[a] method (EPA 1999)
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)										
2-Chloronaphthalene	91-58-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Methyl naphthalene	91-57-6	Chronic	No data	Sediment biota	7.00E+01 µg/kg	NA	No data	ER-L	7.00E+01	Long and others (1995) in Jones and others (1997)
5-Nitroacenaphthene	602-87-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Acenaphthene	83-32-9	Chronic	No data	Sediment biota	4.60E+01 µg/kg	NA	No data	ER-L	4.60E+01	Long and others (1995) in Jones and others (1997)
Acenaphthylene	208-96-8	Chronic	No data	Sediment biota	4.40E+01 µg/kg	NA	No data	ER-L	4.40E+01	Long and others (1995) in Jones and others (1997)
Anthracene	120-12-7	Chronic	No data	Sediment biota	2.20E+02 µg/kg	NA	No data	LEL	2.20E+02	Persaud and others (1993)
Fluorene	86-73-7	Chronic	No data	Sediment biota	1.90E+02 µg/kg	NA	No data	LEL	1.90E+02	Persaud and others (1993)

Table C3-7 Derivation of Sediment Toxicity Reference Values (TRVs) for Exposure of Sediment-Dwelling Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
Indene	95-13-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Naphthalene	91-20-3	Chronic	No data	Sediment biota	1.60E+02 µg/kg	NA	No data	ER-L	1.60E+02	Long and others (1995) in Jones and others (1997)
Phenanthrene	85-01-8	Chronic	No data	Sediment biota	5.60E+02 µg/kg	NA	No data	LEL	5.60E+02	Persaud and others (1993)
Pyrene	129-00-0	Chronic	No data	Sediment biota	4.90E+02 µg/kg	NA	No data	LEL	4.90E+02	Persaud and others (1993)
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)										
3-Methylcholanthrene	56-49-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
5-Methylchrysene	3697-24-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Benzo[a]anthracene	56-55-3	Chronic	No data	*Hyalella azteca*	1.90E+01 µg/kg	NA	No data	ER-L	1.90E+01	Ingersoll and others (1996) in EPA (1999)
Benzo[a]pyrene	50-32-8	Chronic	No data	*Hyalella azteca*	8.40E+01 µg/kg	NA	No data	ER-L	8.40E+01	Ingersoll and others (1996) in EPA (1999)
Benzo[a,i]pyrene	191-30-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Benzo[b]fluoranthene	205-99-2	Chronic	No data	*Hyalella azteca*	3.70E+01 µg/kg	NA	No data	ER-L	3.70E+01	Ingersoll and others (1996) in EPA (1999)
Benzo[e]pyrene	192-97-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Benzo[g,h,i]perylene	191-24-2	Chronic	No data	Sediment biota	1.70E+02 µg/kg	NA	No data	LEL	1.70E+02	Persaud and others (1993)
Benzo[j]fluoranthene	205-82-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Benzo[k]fluoranthene	207-08-9	Chronic	No data	*Hyalella azteca*	3.70E+01 µg/kg	NA	No data	ER-L	3.70E+01	Ingersoll and others (1996) in EPA (1999)
Chrysene	218-01-9	Chronic	No data	*Hyalella azteca*	3.00E+01 µg/kg	NA	No data	ER-L	3.00E+01	Ingersoll and others (1996) in EPA (1999)
Dibenz[a,h]acridine	226-36-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dibenz[a,h]anthracene	53-70-3	Chronic	No data	*Hyalella azteca*	1.00E+01 µg/kg	NA	No data	ER-L	1.00E+01	Ingersoll and others (1996) in EPA (1999)
Dibenz[a,j]acridine	224-42-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dibenzo[a,e]fluoranthene	5385-75-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dibenzo[a,e]pyrene	192-65-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dibenzo[a,h]fluoranthene	No CAS #	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dibenzo[a,h]pyrene	189-64-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dibenzo[a,i]pyrene	189-55-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Fluoranthene	206-44-0	No data	No data	No data	7.50E+02 µg/kg	NA	No data	LEL	7.50E+02	Persaud and others (1993)
Hexachloronaphthalene	1335-87-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Indeno[1,2,3-cd]pyrene	193-39-5	Chronic	No data	*Hyalella azteca*	3.00E+01 µg/kg	NA	No data	ER-L	3.00E+01	Ingersoll and others (1996) in EPA (1999)
Octachloronaphthalene	2234-13-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Pentachloronaphthalene	1321-64-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Tetrachloronaphthalene	1335-88-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Trichloronaphthalene	1321-65-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data

Table C3-7 Derivation of Sediment Toxicity Reference Values (TRVs) for Exposure of Sediment-Dwelling Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
Light Substituted Benzene Compounds (molecular weight <200 g/mole)										
1,2,3-Trichlorobenzene	87-61-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2,4-Trichlorobenzene	120-82-1	Chronic	NOAEL	Aquatic biota	1.10E+02 µg/L	NA	1660 × 0.04 (Koc × TOC)	Not specified	7.30E+03	EqP[a] method (Jones and others 1997)
1,2,4-Trimethyl benzene	95-63-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2-Dichlorobenzene	95-50-1	Chronic	NOAEL	Aquatic biota	1.40E+01 µg/L	NA	379 × 0.04 (Koc × TOC)	Not specified	2.12E+02	EqP[a] method (Jones and others 1997)
1,3,5-Trimethyl benzene	108-67-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,3-Dichlorobenzene	541-73-1	Chronic	NOAEL	Aquatic biota	7.10E+01 µg/L	NA	803 × 0.04 (Koc × TOC)	Not specified	2.28E+03	EqP[a] method (Jones and others 1997)
1,3-Dinitrobenzene	99-65-0	Chronic	NOAEL	Aquatic biota	2.60E+01 µg/L	NA	20.6 × 0.04 (Koc × TOC)	Not specified	2.14E+01	EqP[a] method (EPA 1999)
1,4-Dichlorobenzene	106-46-7	Chronic	NOAEL	Aquatic biota	1.50E+01 µg/L	NA	616 × 0.04 (Koc × TOC)	Not specified	3.70E+02	EqP[a] method (Jones and others 1997)
1,4-Dinitrobenzene	100-25-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,4,5-Trichlorophenol	95-95-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,4,6-Trichlorophenol	88-06-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,4-Dichlorophenol	120-83-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,4-Dimethylphenol	105-67-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,4-Dinitrophenol	51-28-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,4-Dinitrotoluene	121-14-2	Chronic	NOAEL	Aquatic biota	2.30E+01 µg/L	NA	51 × 0.04 (Koc × TOC)	Not specified	4.69E+01	EqP[a] method (EPA 1999)
2,6-Dinitrotoluene	606-20-2	Chronic	NOAEL	Aquatic biota	6.00E+01 µg/L	NA	41.9 × 0.04 (Koc × TOC)	Not specified	1.01E+02	EqP[a] method (EPA 1999)
2-Chlorophenol	95-57-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Chlorotoluene	95-49-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Nitrophenol	88-75-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
4,6-Dinitro-o-cresol	534-52-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
4-Chlorotoluene	106-43-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
4-Nitrophenol	100-02-7	Chronic	NOAEL	Aquatic biota	3.00E+02 µg/L	NA	43.7 × 0.04 (Koc × TOC)	Not specified	5.24E+02	EqP[a] method (Jones and others 1997)
alpha-Methylstyrene	98-83-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Aniline	62-53-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Benzotrichloride	98-07-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Benzyl chloride	100-44-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Bromobenzene	108-86-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Chlorobenzene	108-90-7	Chronic	NOAEL	Aquatic biota	6.40E+01 µg/L	NA	224 × 0.04 (Koc × TOC)	Not specified	5.73E+02	EqP[a] method (Jones and others 1997)
Cumene	98-82-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
m-Cresol	108-39-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data

Table C3-7 Derivation of Sediment Toxicity Reference Values (TRVs) for Exposure of Sediment-Dwelling Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
n-Butyl benzene	104-51-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Nitrobenzene	98-95-3	Chronic	NOAEL	Aquatic biota	2.70E+02 µg/L	NA	119 × 0.04 (Koc × TOC)	Not specified	1.28E+03	EqP[a] method (EPA 1999)
n-Propyl benzene	103-65-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
o-Cresol	95-48-7	Chronic	NOAEL	Aquatic biota	1.30E+01 µg/L	NA	53.4 × 0.04 (Koc × TOC)	Not specified	2.78E+01	EqP[a] method (Jones and others 1997)
o-Dinitrobenzene	528-29-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
o-Nitroaniline	88-74-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
o-Toluidine	95-53-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
p-Chloroaniline	106-47-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
p-Cresol	106-44-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Phenol	108-95-2	Chronic	No data	*Hyalella azteca*	4.80E+01 µg/kg	NA	No data	AET	4.80E+01	Ecology (1994)
p-Nitrochlorobenzene	100-00-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
p-Toluidine	106-49-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
sec-Butyl benzene	135-98-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
tert-Butyl benzene	98-06-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Toluene-2,6-diamine	823-40-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Trimethyl benzene	25551-13-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Other Light Semivolatile Compounds (molecular weight <200 g/mole)										
1,1'-Biphenyl	92-52-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,1-Dimethylhydrazine	57-14-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2-Dimethylhydrazine	540-73-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,2-Diphenylhydrazine	122-66-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,3-Propane sultone	1120-71-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,4-Toluene diisocyanate	584-84-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Chloroacetophenone	532-27-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Propenoic acid	79-10-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
4,4'-Methylenedianiline	101-77-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Acetophenone	98-86-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Benzoic acid	65-85-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Bis(2-chloroethoxy)methane	111-91-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Bis(2-chloroethyl) ether	111-44-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Chlorocyclopentadiene	41851-50-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Cyclohexanol	108-93-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dichloroisopropyl ether	108-60-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dichloromethyl ether	542-88-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dichloropentadiene	61626-71-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dimethyl sulfate	77-78-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dimethylaniline	121-69-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
di-n-Propylnitrosamine	621-64-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Diphenyl ether	101-84-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Epichlorohydrin	106-89-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data

Table C3-7 Derivation of Sediment Toxicity Reference Values (TRVs) for Exposure of Sediment-Dwelling Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
Ethyl carbamate (Urethane)	51-79-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Ethyl methanesulfonate	62-50-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Ethylene dibromide	106-93-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Ethylene glycol	107-21-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Ethylene glycol monobutyl ether	111-76-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Ethylene glycol monoethyl ether acetate	111-15-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Ethylene thiourea	96-45-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Furfural	98-01-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Maleic hydrazide	123-33-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Malononitrile	109-77-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Methyl styrene (mixed isomers)	25013-15-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Methylhydrazine	60-34-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
N,N-Diphenylamine	122-39-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Nitric acid, propyl ester	627-13-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
N-Nitrosodi-n-butylamine	924-16-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
N-Nitrosomorpholine	59-89-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
N-Nitroso-N,N-dimethylamine	62-75-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
o-Anisidine	90-04-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Oxalic acid	144-62-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Phthalic anhydride	85-44-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
p-Phthalic acid	100-21-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Pyridine	110-86-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Quinoline	91-22-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Quinone	106-51-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Safrole	94-59-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Tetrahydrofuran	109-99-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)										
1,2,4,5-Tetrachlorobenzene	95-94-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
1,3,5-Trinitrobenzene	99-35-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2-sec-Butyl-4,6-dinitrophenol	88-85-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
3,3'-Dichlorobenzidine	91-94-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
3,3'-Dimethoxybenzidine	119-90-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
4-Bromophenylphenyl ether	101-55-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Ammonium perfluorooctanoate	3825-26-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Azobenzene	103-33-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)sulfide	96-69-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Captan	133-06-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Chlorobenzilate	510-15-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dibutylphosphate	107-66-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Dimethyl aminoazobenzene	60-11-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data

Table C3-7 Derivation of Sediment Toxicity Reference Values (TRVs) for Exposure of Sediment-Dwelling Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
Hexachlorobenzene	118-74-1	Chronic	No data	Sediment biota	2.00E+01 µg/kg	NA	No data	LEL	2.00E+01	Persaud and others (1993) in EPA (1999)
Hexachlorobutadiene	87-68-3	Chronic	NOAEL	Aquatic biota	9.30E-01 µg/L	NA	6940 × 0.04 (Koc × TOC)	Not specified	2.58E+02	EqP[a] method (EPA 1999)
Hexachlorocyclopentadiene	77-47-4	Chronic	NOAEL	Aquatic biota	5.20E-01 µg/L	NA	9510 × 0.04 (Koc × TOC)	Not specified	1.98E+02	EqP[a] method (EPA 1999)
Hexachloroethane	67-72-1	Chronic	NOAEL	Aquatic biota	1.20E+01 µg/L	NA	1820 × 0.04 (Koc × TOC)	Not specified	8.74E+02	EqP[a] method (Jones and others 1997)
Hexachlorophene	70-30-4	Chronic	NOAEL	Aquatic biota	8.80E-01 µg/L	NA	1.80E+06 × 0.04 (Koc × TOC)	Not specified	6.34E+04	EqP[a] method (EPA 1999)
Hexamethylene-1,5-diisocyanate	822-06-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Mirex	2385-85-5	Chronic	No data	Sediment biota	2.00E+01 µg/kg	NA	No data	LEL	7.00E+00	Persaud and others (1993)
Nitrofen	1836-75-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Pentachlorobenzene	608-93-5	Chronic	NOAEL	Aquatic biota	4.70E-01 µg/L	NA	32,100 × 0.04 (Koc × TOC)	K_{oc} × TOC	6.04E+02	EqP[a] method (EPA 1999)
Pentachloronitrobenzene	82-68-8	Chronic	NOAEL	Aquatic biota	1.00E+01 µg/L	NA	5890 × 0.04 (Koc × TOC)	K_{oc} × TOC	2.36E+03	EqP[a] method (EPA 1999)
Pentachlorophenol	87-86-5	Chronic	No data	*Hyalella azteca*	7.00E+03 µg/kg	NA	No data	AET	7.00E+03	EPA (1999)
Picric acid	88-89-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Pronamide	23950-58-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Strychnine	57-24-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Terphenyls	26140-60-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Tributyl phosphate	126-73-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Trifluralin	1582-09-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Triphenylamine	603-34-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Herbicides and Organochlorinated Pesticides										
2,4,5-T	93-76-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
2,4-D and esters	94-75-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
4,4'-DDD	72-54-8	Chronic	No data	Sediment biota	8.00E+00 µg/kg	NA	No data	LEL	8.00E+00	Persaud and others (1993)
4,4'-DDE	72-55-9	Chronic	No data	Sediment biota	5.00E+00 µg/kg	NA	No data	LEL	5.00E+00	Persaud and others (1993) in EPA (1999)
4,4'-DDT	50-29-3	Chronic	No data	Sediment biota	8.00E+00 µg/kg	NA	No data	LEL	8.00E+00	Persaud and others (1993)
Aldrin	309-00-2	Chronic	No data	Sediment biota	2.00E+00 µg/kg	NA	No data	LEL	2.00E+00	Persaud and others (1993)
alpha-BHC	319-84-6	Chronic	No data	Sediment biota	6.00E+00 µg/kg	NA	No data	LEL	6.00E+00	Persaud and others (1993)

Table C3-7 Derivation of Sediment Toxicity Reference Values (TRVs) for Exposure of Sediment-Dwelling Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
beta-BHC	319-85-7	Chronic	No data	Sediment biota	5.00E+00 µg/kg	NA	No data	LEL	5.00E+00	Persaud and others (1993)
Chlordane	57-74-9	Chronic	No data	Sediment biota	7.00E+00 µg/kg	NA	No data	LEL	7.00E+00	Persaud and others (1993)
delta-BHC	319-86-8	Chronic	NOAEL	Aquatic biota	2.20E+00 µg/L	NA	2.82 × 0.04 (Koc × TOC)	Not specified	2.48E-01	EqP[a] method (Jones and others 1997)
Dieldrin	60-57-1	Chronic	No data	Sediment biota	2.00E+00 µg/kg	NA	No data	LEL	2.00E+00	Persaud and others (1993)
Endothall	145-73-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Endrin	72-20-8	Chronic	No data	Sediment biota	3.00E+00 µg/kg	NA	No data	LEL	3.00E+00	Persaud and others (1993)
gamma-BHC (Lindane)	58-89-9	Chronic	No data	Sediment biota	3.00E+00 µg/kg	NA	No data	LEL	3.00E+00	Persaud and others (1993)
Heptachlor	76-44-8	Chronic	No data	Sediment biota	8.80E-01 µg/kg	NA	No data	NEL	3.08E-01	EPA (1999)
Isodrin	465-73-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Methoxychlor	72-43-5	Chronic	NOAEL	Aquatic biota	1.90E-02 µg/L	NA	80,000 × 0.04 (Koc × TOC)	Not specified	6.08E+01	EqP[a] method (Jones and others 1997)
Silvex (2,4,5-TP)	93-72-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Toxaphene	8001-35-2	Chronic	NOAEL	Aquatic biota	1.75E+02 µg/L	NA	5 × 0.04 (Koc × TOC)	Not specified	3.50E+01	EqP[a] method (Jones and others 1997)
Inorganic Chemicals and Compounds					(mg/kg)				(mg/kg)	
	Metals									
Aluminum	7429-90-5	Chronic	No data	*Hyalella azteca*	1.40E+04	NA	No data	ER-L	1.40E+04	Ingersoll and others (1996) in EPA (1999)
Antimony	7440-36-0	Chronic	No data	*Hyalella azteca*	6.40E+01	NA	No data	AET	6.40E+01	Ecology (1994) in EPA (1999)
Arsenic	7440-38-2	Chronic	No data	Sediment biota	6.00E+00	NA	No data	LEL	6.00E+00	Persaud and others (1993) in EPA (1999)
Barium	7440-39-3	Chronic	No data	Sediment biota	2.00E+01	NA	No data	No data	2.00E+01	EPA Region 5 guideline (Hull and Suter 1994 in EPA 1999)
Beryllium	7440-41-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Bismuth	7440-69-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Boron	7440-42-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Cadmium	7440-43-9	Chronic	No data	Sediment biota	6.00E-01	NA	No data	LEL	6.00E-01	Persaud and others (1993) in EPA (1999)
Calcium	7440-70-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Chromium[c]	18540-29-9	Chronic	No data	Sediment biota	2.60E+01	NA	No data	LEL	2.60E+01	Persaud and others (1993) in EPA (1999)
Cobalt	7440-48-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Copper	7440-50-8	Chronic	No data	Sediment biota	1.60E+01	NA	No data	LEL	1.60E+01	Persaud and others (1993) in EPA (1999)

Table C3-7 Derivation of Sediment Toxicity Reference Values (TRVs) for Exposure of Sediment-Dwelling Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
Iron	7439-89-6	Chronic	No data	Sediment biota	2.00E+04	NA	No data	LEL	2.00E+04	Persaud and others (1993)
Lead	7439-92-1	Chronic	No data	Sediment biota	3.10E+01	NA	No data	LEL	3.10E+01	Persaud and others (1993) in EPA (1999)
Lithium	7439-93-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Magnesium	7439-95-4	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Manganese	7439-96-5	Chronic	No data	Sediment biota	4.60E+02	NA	No data	LEL	4.60E+02	Persaud and others (1993)
Mercury	7439-97-6	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury - Hg+2	7487-94-7	Chronic	NA	NA	NA	NA	NA	NA	2.00E-01	LEL for total mercury used as surrogate (EPA 1999)
Methylmercury	22967-92-6	Chronic	NA	NA	NA	NA	NA	NA	2.00E-01	LEL for total mercury used as surrogate (EPA 1999)
Molybdenum	7439-98-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Nickel	7440-02-0	Chronic	No data	Sediment biota	1.60E+01	NA	No data	LEL	1.60E+01	Persaud and others (1993) in EPA (1999)
Potassium	7440-09-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Rhodium	7440-16-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Selenium	7782-49-2	Chronic	No data	*Hyalella azteca*	1.00E-01	NA	No data	AET	1.00E-01	Ecology (1994) in EPA (1999)
Silicon	7440-21-3	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Silver	7440-22-4	Chronic	No data	*Hyalella azteca*	4.50E+00	NA	No data	AET	4.50E+00	Ecology (1994) in EPA (1999)
Sodium	7440-23-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Strontium	7440-24-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Tantalum	7440-25-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Thallium	7440-28-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Tin	7440-31-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Tungsten	7440-33-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Uranium	7440-61-1	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Vanadium	7440-62-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Yttrium	7440-65-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Zinc	7440-66-6	Chronic	No data	*Hyalella azteca*	1.10E+02	NA	No data	ER-L	1.10E+02	Ingersoll and others (1996) in EPA (1999)
Zirconium	7440-67-7	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Non-metals and Anions										
Ammonia/Ammonium	7664-41-7	Chronic	No data	*Hyalella azteca*	9.30E+02	NA	No data	AET	9.30E+02	Ecology (1997)
Bromide	24959-67-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Chloride	16887-00-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Cyanide	57-12-5	Chronic	No data	Sediment biota	1.00E-01	NA	No data	No data	1.00E-01	EPA Region 5 guideline (Hull and Suter 1994 in EPA 1999)
Fluoride	16984-48-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Hydroxide	14280-30-9	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Iodine	7553-56-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data

Table C3-7 Derivation of Sediment Toxicity Reference Values (TRVs) for Exposure of Sediment-Dwelling Invertebrates to COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Test duration	Endpoint	Test species	Endpoint Concen-tration (EC)	Duration conversion factor (DCF)	Endpoint conversion factor (ECF)	Effect	TRV (EC × DCF × ECF)	Source
Nitrate	14797-55-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Nitrite	14797-65-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Phosphate	14265-44-2	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Phosphorus	7723-14-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Sulfate	14808-79-8	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Total sulfur	63705-05-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
	Criteria Pollutants									
Carbon monoxide	630-08-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Nitrogen dioxide	10102-44-0	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Ozone	10028-15-6	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Particulate matter	No CAS #	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Sulfur dioxide	7446-09-5	No data	No data	No data	No data	NA	No data	No data	No TRV	No data
Radionuclides										
All radionuclides combined (rad/d)[d]	No CAS #	Chronic	Adverse effects	Sediment biota	NA	NA	NA	Population effects	1.00E+00	NCRP (1991)

Notes/Sources

No data = No data available.
NA = Not applicable.
CAS = Chemical Abstracts Service.
EC = Concentration that caused the reported effect.
DCF = Duration conversion factor; not applicable for sediment toxicity derivation.
ECF = Endpoint conversion factor; for sediment, used to convert aquatic TRV to sediment TRV by equilibrium partitioning[a].
TRV = Toxicity reference value.
NOAEL = No observed adverse effect level.
K_{oc} = Soil carbon partition coefficient.
TOC = Total organic carbon, assumed to be 4 % (EPA 1999).
LEL = Ontario Ministry of the Interior Lowest Effect Level (Persaud and others 1993).
ER-L = National Oceanic and Atmospheric Administration Effects Range-Low (Long and others 1995; Ingersoll and others 1996).
AET = Washington State Department of Ecology Apparent Effects Threshold (Ecology 1994; Ecology 1997).

[a] EqP - Equilibrium partitioning, assumes
1) toxicity of sediment is due to COPC dissolved in porewater,
2) toxicity in porewater is the same as toxicity in surface water, and
3) concentration of COPC in porewater is equal to concentration in sediment divided by K_{oc}
The sediment TRV is calculated by multiplying the freshwater TRV by K_{oc} and TOC.

[b] Data for Aroclor-1254 used as representative of polychlorinated biphenyl mixtures.

[c] Values for hexavalent chromium, which is more toxic than trivalent chromium.

[d] TRV is not applicable to single radionuclides. Combined external and internal radiation exposure for sediment biota from all radionuclides combined cannot exceed 1 rad/d.

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Exposure, Terrestrial Receptors			
		Plant		Terrestrial Invertebrate	
		TRV	Source	TRV	Source
Organic Compounds		(µg/kg)		(µg/kg)	
Aromatic Halogenated Hydrocarbons					
2,3,4,6-Tetrachlorophenol	58-90-2	No TRV		No TRV	
4-Chloro-3-methylphenol	59-50-7	No TRV		No TRV	
Aromatic Nonhalogenated Hydrocarbons					
2-Nitrotoluene	88-72-2	No TRV		No TRV	
4-Nitrobiphenyl	92-93-3	No TRV		No TRV	
Benzaldehyde	100-52-7	No TRV		No TRV	
Benzene	71-43-2	No TRV		No TRV	
Benzyl alcohol	100-51-6	No TRV		No TRV	
Ethyl benzene	100-41-4	No TRV		No TRV	
m-Xylene	108-38-3	No TRV		No TRV	
o-Xylene	95-47-6	No TRV		No TRV	
p-Xylene	106-42-3	No TRV		No TRV	
Styrene	100-42-5	3.00E+05	Efroymson and others (1997a)[e]	No TRV	
Toluene	108-88-3	2.00E+05	Efroymson and others (1997a)[e]	No TRV	
Non-aromatic Nonhalogenated Hydrocarbons					
1,2-Epoxybutane	106-88-7	No TRV		No TRV	
1,3-Butadiene	106-99-0	No TRV		No TRV	
1,4-Dioxane	123-91-1	No TRV		No TRV	
1-Methylpropyl alcohol	78-92-2	No TRV		No TRV	
1-Nitropropane	108-03-2	No TRV		No TRV	
2,2,4-Trimethylpentane	540-84-1	No TRV		No TRV	
2-Butanone	78-93-3	No TRV		No TRV	
2-Butenaldehyde (2-Butenal)	4170-30-3	No TRV		No TRV	
2-Ethoxyethanol	110-80-5	No TRV		No TRV	
2-Heptanone	110-43-0	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Mule Deer		Mourning Dove	
		NOAEL TRV	Source	NOAEL TRV	Source
Organic Compounds		(µg/kg BW/d)		(µg/kg BW/d)	
Aromatic Halogenated Hydrocarbons					
2,3,4,6-Tetrachlorophenol	58-90-2	2.50E+03	US EPA (1986a) in IRIS (2002)[a]	No TRV	
4-Chloro-3-methylphenol	59-50-7	No TRV		No TRV	
Aromatic Nonhalogenated Hydrocarbons					
2-Nitrotoluene	88-72-2	No TRV		No TRV	
4-Nitrobiphenyl	92-93-3	No TRV		No TRV	
Benzaldehyde	100-52-7	1.43E+04	Kluwe and others (1983) in IRIS (2002)[a]	No TRV	
Benzene	71-43-2	2.64E+04	Nawrot and Staples (1979) in Sample and others (1996)[c]	No TRV	
Benzyl alcohol	100-51-6	No TRV		No TRV	
Ethyl benzene	100-41-4	9.71E+03	Wolf and others (1956) in IRIS (2002)[a]	No TRV	
m-Xylene	108-38-3	No TRV		No TRV	
o-Xylene	95-47-6	No TRV		No TRV	
p-Xylene	106-42-3	No TRV		No TRV	
Styrene	100-42-5	2.00E+04	Quast and others (1979) in IRIS (2002)[a]	No TRV	
Toluene	108-88-3	2.60E+04	Nawrot and Staples (1979) in Sample and others (1996)[c]	No TRV	
Non-aromatic Nonhalogenated Hydrocarbons					
1,2-Epoxybutane	106-88-7	No TRV		No TRV	
1,3-Butadiene	106-99-0	No TRV		No TRV	
1,4-Dioxane	123-91-1	1.06E+05	EPA 1999[f]	No TRV	
1-Methylpropyl alcohol	78-92-2	No TRV		No TRV	
1-Nitropropane	108-03-2	No TRV		No TRV	
2,2,4-Trimethylpentane	540-84-1	No TRV		No TRV	
2-Butanone	78-93-3	1.77E+06	Cox and others (1975) in IRIS (2002)[a]	No TRV	
2-Butenaldehyde (2-Butenal)	4170-30-3	8.00E+01	EPA 1999[f]	No TRV	
2-Ethoxyethanol	110-80-5	No TRV		No TRV	
2-Heptanone	110-43-0	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Great Basin Pocket Mouse		Western Meadowlark	
		NOAEL TRV	Source	NOAEL TRV	Source
Organic Compounds		(µg/kg BW/d)		(µg/kg BW/d)	
Aromatic Halogenated Hydrocarbons					
2,3,4,6-Tetrachlorophenol	58-90-2	2.50E+03	US EPA (1986a) in IRIS (2002)[a]	No TRV	
4-Chloro-3-methylphenol	59-50-7	No TRV		No TRV	
Aromatic Nonhalogenated Hydrocarbons					
2-Nitrotoluene	88-72-2	No TRV		No TRV	
4-Nitrobiphenyl	92-93-3	No TRV		No TRV	
Benzaldehyde	100-52-7	1.43E+04	Kluwe and others (1983) in IRIS (2002)[a]	No TRV	
Benzene	71-43-2	2.64E+04	Nawrot and Staples (1979) in Sample and others (1996)[c]	No TRV	
Benzyl alcohol	100-51-6	No TRV		No TRV	
Ethyl benzene	100-41-4	9.71E+03	Wolf and others (1956) in IRIS (2002)[a]	No TRV	
m-Xylene	108-38-3	No TRV		No TRV	
o-Xylene	95-47-6	No TRV		No TRV	
p-Xylene	106-42-3	No TRV		No TRV	
Styrene	100-42-5	2.00E+04	Quast and others (1979) in IRIS (2002)[a]	No TRV	
Toluene	108-88-3	2.60E+04	Nawrot and Staples (1979) in Sample and others (1996)[c]	No TRV	
Non-aromatic Nonhalogenated Hydrocarbons					
1,2-Epoxybutane	106-88-7	No TRV		No TRV	
1,3-Butadiene	106-99-0	No TRV		No TRV	
1,4-Dioxane	123-91-1	1.06E+05	EPA 1999[f]	No TRV	
1-Methylpropyl alcohol	78-92-2	No TRV		No TRV	
1-Nitropropane	108-03-2	No TRV		No TRV	
2,2,4-Trimethylpentane	540-84-1	No TRV		No TRV	
2-Butanone	78-93-3	1.77E+06	Cox and others (1975) in IRIS (2002)[a]	No TRV	
2-Butenaldehyde (2-Butenal)	4170-30-3	8.00E+01	EPA 1999[f]	No TRV	
2-Ethoxyethanol	110-80-5	No TRV		No TRV	
2-Heptanone	110-43-0	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Coyote		Burrowing Owl	
		NOAEL TRV	Source	NOAEL TRV	Source
Organic Compounds		(µg/kg BW/d)		(µg/kg BW/d)	
Aromatic Halogenated Hydrocarbons					
2,3,4,6-Tetrachlorophenol	58-90-2	2.50E+03	US EPA (1986a) in IRIS (2002)[a]	No TRV	
4-Chloro-3-methylphenol	59-50-7	No TRV		No TRV	
Aromatic Nonhalogenated Hydrocarbons					
2-Nitrotoluene	88-72-2	No TRV		No TRV	
4-Nitrobiphenyl	92-93-3	No TRV		No TRV	
Benzaldehyde	100-52-7	1.43E+04	Kluwe and others (1983) in IRIS (2002)[a]	No TRV	
Benzene	71-43-2	2.64E+04	Nawrot and Staples (1979) in Sample and others (1996)[c]	No TRV	
Benzyl alcohol	100-51-6	No TRV		No TRV	
Ethyl benzene	100-41-4	9.71E+03	Wolf and others (1956) in IRIS (2002)[a]	No TRV	
m-Xylene	108-38-3	No TRV		No TRV	
o-Xylene	95-47-6	No TRV		No TRV	
p-Xylene	106-42-3	No TRV		No TRV	
Styrene	100-42-5	2.00E+04	Quast and others (1979) in IRIS (2002)[a]	No TRV	
Toluene	108-88-3	2.60E+04	Nawrot and Staples (1979) in Sample and others (1996)[c]	No TRV	
Non-aromatic Nonhalogenated Hydrocarbons					
1,2-Epoxybutane	106-88-7	No TRV		No TRV	
1,3-Butadiene	106-99-0	No TRV		No TRV	
1,4-Dioxane	123-91-1	1.06E+05	EPA 1999[f]	No TRV	
1-Methylpropyl alcohol	78-92-2	No TRV		No TRV	
1-Nitropropane	108-03-2	No TRV		No TRV	
2,2,4-Trimethylpentane	540-84-1	No TRV		No TRV	
2-Butanone	78-93-3	1.77E+06	Cox and others (1975) in IRIS (2002)[a]	No TRV	
2-Butenaldehyde (2-Butenal)	4170-30-3	8.00E+01	EPA 1999[f]	No TRV	
2-Ethoxyethanol	110-80-5	No TRV		No TRV	
2-Heptanone	110-43-0	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures		Ingestion, Aquatic Exposures	
		Red-tailed Hawk		Canada Goose	
		NOAEL TRV	Source	NOAEL TRV	Source
Organic Compounds		(µg/kg BW/d)		(µg/kg BW/d)	
Aromatic Halogenated Hydrocarbons					
2,3,4,6-Tetrachlorophenol	58-90-2	No TRV		No TRV	
4-Chloro-3-methylphenol	59-50-7	No TRV		No TRV	
Aromatic Nonhalogenated Hydrocarbons					
2-Nitrotoluene	88-72-2	No TRV		No TRV	
4-Nitrobiphenyl	92-93-3	No TRV		No TRV	
Benzaldehyde	100-52-7	No TRV		No TRV	
Benzene	71-43-2	No TRV		No TRV	
Benzyl alcohol	100-51-6	No TRV		No TRV	
Ethyl benzene	100-41-4	No TRV		No TRV	
m-Xylene	108-38-3	No TRV		No TRV	
o-Xylene	95-47-6	No TRV		No TRV	
p-Xylene	106-42-3	No TRV		No TRV	
Styrene	100-42-5	No TRV		No TRV	
Toluene	108-88-3	No TRV		No TRV	
Non-aromatic Nonhalogenated Hydrocarbons					
1,2-Epoxybutane	106-88-7	No TRV		No TRV	
1,3-Butadiene	106-99-0	No TRV		No TRV	
1,4-Dioxane	123-91-1	No TRV		No TRV	
1-Methylpropyl alcohol	78-92-2	No TRV		No TRV	
1-Nitropropane	108-03-2	No TRV		No TRV	
2,2,4-Trimethylpentane	540-84-1	No TRV		No TRV	
2-Butanone	78-93-3	No TRV		No TRV	
2-Butenaldehyde (2-Butenal)	4170-30-3	No TRV		No TRV	
2-Ethoxyethanol	110-80-5	No TRV		No TRV	
2-Heptanone	110-43-0	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Spotted Sandpiper		Great Blue Heron	
		NOAEL TRV	Source	NOAEL TRV	Source
Organic Compounds		(µg/kg BW/d)		(µg/kg BW/d)	
Aromatic Halogenated Hydrocarbons					
2,3,4,6-Tetrachlorophenol	58-90-2	No TRV		No TRV	
4-Chloro-3-methylphenol	59-50-7	No TRV		No TRV	
Aromatic Nonhalogenated Hydrocarbons					
2-Nitrotoluene	88-72-2	No TRV		No TRV	
4-Nitrobiphenyl	92-93-3	No TRV		No TRV	
Benzaldehyde	100-52-7	No TRV		No TRV	
Benzene	71-43-2	No TRV		No TRV	
Benzyl alcohol	100-51-6	No TRV		No TRV	
Ethyl benzene	100-41-4	No TRV		No TRV	
m-Xylene	108-38-3	No TRV		No TRV	
o-Xylene	95-47-6	No TRV		No TRV	
p-Xylene	106-42-3	No TRV		No TRV	
Styrene	100-42-5	No TRV		No TRV	
Toluene	108-88-3	No TRV		No TRV	
Non-aromatic Nonhalogenated Hydrocarbons					
1,2-Epoxybutane	106-88-7	No TRV		No TRV	
1,3-Butadiene	106-99-0	No TRV		No TRV	
1,4-Dioxane	123-91-1	No TRV		No TRV	
1-Methylpropyl alcohol	78-92-2	No TRV		No TRV	
1-Nitropropane	108-03-2	No TRV		No TRV	
2,2,4-Trimethylpentane	540-84-1	No TRV		No TRV	
2-Butanone	78-93-3	No TRV		No TRV	
2-Butenaldehyde (2-Butenal)	4170-30-3	No TRV		No TRV	
2-Ethoxyethanol	110-80-5	No TRV		No TRV	
2-Heptanone	110-43-0	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Bald Eagle		Mink	
		NOAEL TRV	Source	NOAEL TRV	Source
Organic Compounds		(µg/kg BW/d)		(µg/kg BW/d)	
Aromatic Halogenated Hydrocarbons					
2,3,4,6-Tetrachlorophenol	58-90-2	No TRV		2.50E+03	US EPA (1986a) in IRIS (2002)[a]
4-Chloro-3-methylphenol	59-50-7	No TRV		No TRV	
Aromatic Nonhalogenated Hydrocarbons					
2-Nitrotoluene	88-72-2	No TRV		No TRV	
4-Nitrobiphenyl	92-93-3	No TRV		No TRV	
Benzaldehyde	100-52-7	No TRV		1.43E+04	Kluwe and others (1983) in IRIS (2002)[a]
Benzene	71-43-2	No TRV		2.64E+04	Nawrot and Staples (1979) in Sample and others (1996)[c]
Benzyl alcohol	100-51-6	No TRV		No TRV	
Ethyl benzene	100-41-4	No TRV		9.71E+03	Wolf and others (1956) in IRIS (2002)[a]
m-Xylene	108-38-3	No TRV		No TRV	
o-Xylene	95-47-6	No TRV		No TRV	
p-Xylene	106-42-3	No TRV		No TRV	
Styrene	100-42-5	No TRV		2.00E+04	Quast and others (1979) in IRIS (2002)[a]
Toluene	108-88-3	No TRV		2.60E+04	Nawrot and Staples (1979) in Sample and others (1996)[c]
Non-aromatic Nonhalogenated Hydrocarbons					
1,2-Epoxybutane	106-88-7	No TRV		No TRV	
1,3-Butadiene	106-99-0	No TRV		No TRV	
1,4-Dioxane	123-91-1	No TRV		1.06E+05	EPA 1999[f]
1-Methylpropyl alcohol	78-92-2	No TRV		No TRV	
1-Nitropropane	108-03-2	No TRV		No TRV	
2,2,4-Trimethylpentane	540-84-1	No TRV		No TRV	
2-Butanone	78-93-3	No TRV		1.77E+06	Cox and others (1975) in IRIS (2002)[a]
2-Butenaldehyde (2-Butenal)	4170-30-3	No TRV		8.00E+01	EPA 1999[f]
2-Ethoxyethanol	110-80-5	No TRV		No TRV	
2-Heptanone	110-43-0	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors			
		Aquatic Biota		Chinook Salmon and Other Salmonids	
		NOAEL TRV	Source	NOAEL TRV	Source
Organic Compounds		(µg/L)		(µg/L)	
Aromatic Halogenated Hydrocarbons					
2,3,4,6-Tetrachlorophenol	58-90-2	No TRV		No TRV	
4-Chloro-3-methylphenol	59-50-7	3.00E-01	EPA 1987[b]	3.00E-01	EPA 1987[b]
Aromatic Nonhalogenated Hydrocarbons					
2-Nitrotoluene	88-72-2	No TRV		No TRV	
4-Nitrobiphenyl	92-93-3	No TRV		No TRV	
Benzaldehyde	100-52-7	No TRV		No TRV	
Benzene	71-43-2	1.30E+02	Tier II Chronic (Suter & Tsao 1996)[d]	3.16E-02	Acute LOAEL for rainbow trout (Suter and Tsao 1996[d] Table C-1) × 0.1 for LOAEL-to-NOAEL conversion × 0.1 for acute-to-chronic conversion
Benzyl alcohol	100-51-6	8.60E+00	Tier II Chronic (Suter & Tsao 1996)[d]	8.60E+00	Tier II Chronic (Suter & Tsao 1996)[d]
Ethyl benzene	100-41-4	7.30E+00	Tier II Chronic (Suter & Tsao 1996)[d]	7.30E+00	Tier II Chronic (Suter & Tsao 1996)[d]
m-Xylene	108-38-3	1.80E+00	Tier II Chronic (Suter & Tsao 1996)[d]	1.80E+00	Tier II Chronic (Suter & Tsao 1996)[d]
o-Xylene	95-47-6	No TRV		No TRV	
p-Xylene	106-42-3	No TRV		No TRV	
Styrene	100-42-5	No TRV		No TRV	
Toluene	108-88-3	9.80E+00	Tier II Chronic (Suter & Tsao 1996)[d]	9.80E+00	Tier II Chronic (Suter & Tsao 1996)[d]
Non-aromatic Nonhalogenated Hydrocarbons					
1,2-Epoxybutane	106-88-7	No TRV		No TRV	
1,3-Butadiene	106-99-0	No TRV		No TRV	
1,4-Dioxane	123-91-1	6.21E+04	EPA 1999[f]	6.21E+04	EPA 1999[f]
1-Methylpropyl alcohol	78-92-2	No TRV		No TRV	
1-Nitropropane	108-03-2	No TRV		No TRV	
2,2,4-Trimethylpentane	540-84-1	No TRV		No TRV	
2-Butanone	78-93-3	1.40E+04	Tier II Chronic (Suter & Tsao 1996)[d]	1.40E+04	Tier II Chronic (Suter & Tsao 1996)[d]
2-Butenaldehyde (2-Butenal)	4170-30-3	3.50E+01	EPA 1999[f]	3.50E+01	EPA 1999[f]
2-Ethoxyethanol	110-80-5	No TRV		No TRV	
2-Heptanone	110-43-0	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors	
		Benthic Organisms	
		NOAEL TRV	Source
Organic Compounds		(µg/kg)	
Aromatic Halogenated Hydrocarbons			
2,3,4,6-Tetrachlorophenol	58-90-2	No TRV	
4-Chloro-3-methylphenol	59-50-7	4.45E+00	EqP method (Jones and others 1997)[i]
Aromatic Nonhalogenated Hydrocarbons			
2-Nitrotoluene	88-72-2	No TRV	
4-Nitrobiphenyl	92-93-3	No TRV	
Benzaldehyde	100-52-7	No TRV	
Benzene	71-43-2	3.22E+02	EqP method (Jones and others 1997)[i]
Benzyl alcohol	100-51-6	3.51E+00	EqP method (Jones and others 1997)[i]
Ethyl benzene	100-41-4	5.96E+01	EqP method (Jones and others 1997)[i]
m-Xylene	108-38-3	1.41E+01	EqP method (Jones and others 1997)[i]
o-Xylene	95-47-6	No TRV	
p-Xylene	106-42-3	No TRV	
Styrene	100-42-5	No TRV	
Toluene	108-88-3	5.49E+01	EqP method (Jones and others 1997)[i]
Non-aromatic Nonhalogenated Hydrocarbons			
1,2-Epoxybutane	106-88-7	No TRV	
1,3-Butadiene	106-99-0	No TRV	
1,4-Dioxane	123-91-1	2.17E+03	EPA 1999[f]
1-Methylpropyl alcohol	78-92-2	No TRV	
1-Nitropropane	108-03-2	No TRV	
2,2,4-Trimethylpentane	540-84-1	No TRV	
2-Butanone	78-93-3	1.31E+03	EqP method (Jones and others 1997)[i]
2-Butenaldehyde (2-Butenal)	4170-30-3	No TRV	
2-Ethoxyethanol	110-80-5	No TRV	
2-Heptanone	110-43-0	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Exposure, Terrestrial Receptors			
		Plant		Terrestrial Invertebrate	
		TRV	Source	TRV	Source
2-Hexanone	591-78-6	No TRV		No TRV	
2-Methoxyethanol	109-86-4	No TRV		No TRV	
2-Methyl-2-propanol	75-65-0	No TRV		No TRV	
2-Methyl-2-propenenitrile	126-98-7	No TRV		No TRV	
2-Methylaziridine	75-55-8	No TRV		No TRV	
2-Methylpropyl alcohol	78-83-1	No TRV		No TRV	
2-Pentanone	107-87-9	No TRV		No TRV	
2-Propanone (Acetone)	67-64-1	No TRV		No TRV	
2-Propene-1-ol	107-18-6	No TRV		No TRV	
2-Propyl alcohol	67-63-0	No TRV		No TRV	
3-Heptanone	106-35-4	No TRV		No TRV	
3-Methyl-1-butanol	123-51-3	No TRV		No TRV	
3-Methyl-2-butanone	563-80-4	No TRV		No TRV	
3-Pentanone	96-22-0	No TRV		No TRV	
4-Heptanone	123-19-3	No TRV		No TRV	
4-Methyl-2-pentanone	108-10-1	No TRV		No TRV	
4-Methyl-3-penten-2-one	141-79-7	No TRV		No TRV	
5-Methyl-2-hexanone	110-12-3	No TRV		No TRV	
Acetaldehyde	75-07-0	No TRV		No TRV	
Acetamide	60-35-5	No TRV		No TRV	
Acetic acid	64-19-7	No TRV		No TRV	
Acetic acid ethyl ester	141-78-6	No TRV		No TRV	
Acetic acid n-butyl ester	123-86-4	No TRV		No TRV	
Acetonitrile	75-05-8	No TRV		No TRV	
Acrolein	107-02-8	No TRV		No TRV	
Acrylonitrile	107-13-1	No TRV		No TRV	
Bis(isopropyl)ether	108-20-3	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Mule Deer		Mourning Dove	
		NOAEL TRV	Source	NOAEL TRV	Source
2-Hexanone	591-78-6	No TRV		No TRV	
2-Methoxyethanol	109-86-4	No TRV		No TRV	
2-Methyl-2-propanol	75-65-0	No TRV		No TRV	
2-Methyl-2-propenenitrile	126-98-7	3.40E+01	Pozzani and others (1968) in IRIS (2002)[a]	No TRV	
2-Methylaziridine	75-55-8	No TRV		No TRV	
2-Methylpropyl alcohol	78-83-1	3.16E+04	US EPA (1986b) in IRIS (2002)[a]	No TRV	
2-Pentanone	107-87-9	No TRV		No TRV	
2-Propanone (Acetone)	67-64-1	1.00E+04	EPA 1999[f]	5.20E+04	EPA 1999[f]
2-Propene-1-ol	107-18-6	4.80E+02	Carpanini and others (1978) in IRIS (2002)[a]	No TRV	
2-Propyl alcohol	67-63-0	No TRV		No TRV	
3-Heptanone	106-35-4	No TRV		No TRV	
3-Methyl-1-butanol	123-51-3	No TRV		No TRV	
3-Methyl-2-butanone	563-80-4	No TRV		No TRV	
3-Pentanone	96-22-0	No TRV		No TRV	
4-Heptanone	123-19-3	No TRV		No TRV	
4-Methyl-2-pentanone	108-10-1	2.50E+04	Microbiological Associates (1986) in Sample and others (1996)[c]	No TRV	
4-Methyl-3-penten-2-one	141-79-7	No TRV		No TRV	
5-Methyl-2-hexanone	110-12-3	No TRV		No TRV	
Acetaldehyde	75-07-0	No TRV		No TRV	
Acetamide	60-35-5	No TRV		No TRV	
Acetic acid	64-19-7	No TRV		No TRV	
Acetic acid ethyl ester	141-78-6	9.00E+04	US EPA (1986c) in IRIS (2002)[a]	No TRV	
Acetic acid n-butyl ester	123-86-4	No TRV		No TRV	
Acetonitrile	75-05-8	No TRV		No TRV	
Acrolein	107-02-8	No TRV		No TRV	
Acrylonitrile	107-13-1	4.60E+02	EPA 1999[f]	No TRV	
Bis(isopropyl)ether	108-20-3	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Great Basin Pocket Mouse		Western Meadowlark	
		NOAEL TRV	Source	NOAEL TRV	Source
2-Hexanone	591-78-6	No TRV		No TRV	
2-Methoxyethanol	109-86-4	No TRV		No TRV	
2-Methyl-2-propanol	75-65-0	No TRV		No TRV	
2-Methyl-2-propenenitrile	126-98-7	3.40E+01	Pozzani and others (1968) in IRIS (2002)[a]	No TRV	
2-Methylaziridine	75-55-8	No TRV		No TRV	
2-Methylpropyl alcohol	78-83-1	3.16E+04	US EPA (1986b) in IRIS (2002)[a]	No TRV	
2-Pentanone	107-87-9	No TRV		No TRV	
2-Propanone (Acetone)	67-64-1	1.00E+04	EPA 1999[f]	5.20E+04	EPA 1999[f]
2-Propene-1-ol	107-18-6	4.80E+02	Carpanini and others (1978) in IRIS (2002)[a]	No TRV	
2-Propyl alcohol	67-63-0	No TRV		No TRV	
3-Heptanone	106-35-4	No TRV		No TRV	
3-Methyl-1-butanol	123-51-3	No TRV		No TRV	
3-Methyl-2-butanone	563-80-4	No TRV		No TRV	
3-Pentanone	96-22-0	No TRV		No TRV	
4-Heptanone	123-19-3	No TRV		No TRV	
4-Methyl-2-pentanone	108-10-1	2.50E+04	Microbiological Associates (1986) in Sample and others (1996)[c]	No TRV	
4-Methyl-3-penten-2-one	141-79-7	No TRV		No TRV	
5-Methyl-2-hexanone	110-12-3	No TRV		No TRV	
Acetaldehyde	75-07-0	No TRV		No TRV	
Acetamide	60-35-5	No TRV		No TRV	
Acetic acid	64-19-7	No TRV		No TRV	
Acetic acid ethyl ester	141-78-6	9.00E+04	US EPA (1986c) in IRIS (2002)[a]	No TRV	
Acetic acid n-butyl ester	123-86-4	No TRV		No TRV	
Acetonitrile	75-05-8	No TRV		No TRV	
Acrolein	107-02-8	No TRV		No TRV	
Acrylonitrile	107-13-1	4.60E+02	EPA 1999[f]	No TRV	
Bis(isopropyl)ether	108-20-3	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Coyote		Burrowing Owl	
		NOAEL TRV	Source	NOAEL TRV	Source
2-Hexanone	591-78-6	No TRV		No TRV	
2-Methoxyethanol	109-86-4	No TRV		No TRV	
2-Methyl-2-propanol	75-65-0	No TRV		No TRV	
2-Methyl-2-propenenitrile	126-98-7	3.40E+01	Pozzani and others (1968) in IRIS (2002)[a]	No TRV	
2-Methylaziridine	75-55-8	No TRV		No TRV	
2-Methylpropyl alcohol	78-83-1	3.16E+04	US EPA (1986b) in IRIS (2002)[a]	No TRV	
2-Pentanone	107-87-9	No TRV		No TRV	
2-Propanone (Acetone)	67-64-1	1.00E+04	EPA 1999[f]	5.20E+04	EPA 1999[f]
2-Propene-1-ol	107-18-6	4.80E+02	Carpanini and others (1978) in IRIS (2002)[a]	No TRV	
2-Propyl alcohol	67-63-0	No TRV		No TRV	
3-Heptanone	106-35-4	No TRV		No TRV	
3-Methyl-1-butanol	123-51-3	No TRV		No TRV	
3-Methyl-2-butanone	563-80-4	No TRV		No TRV	
3-Pentanone	96-22-0	No TRV		No TRV	
4-Heptanone	123-19-3	No TRV		No TRV	
4-Methyl-2-pentanone	108-10-1	2.50E+04	Microbiological Associates (1986) in Sample and others (1996)[e]	No TRV	
4-Methyl-3-penten-2-one	141-79-7	No TRV		No TRV	
5-Methyl-2-hexanone	110-12-3	No TRV		No TRV	
Acetaldehyde	75-07-0	No TRV		No TRV	
Acetamide	60-35-5	No TRV		No TRV	
Acetic acid	64-19-7	No TRV		No TRV	
Acetic acid ethyl ester	141-78-6	9.00E+04	US EPA (1986c) in IRIS (2002)[a]	No TRV	
Acetic acid n-butyl ester	123-86-4	No TRV		No TRV	
Acetonitrile	75-05-8	No TRV		No TRV	
Acrolein	107-02-8	No TRV		No TRV	
Acrylonitrile	107-13-1	4.60E+02	EPA 1999[f]	No TRV	
Bis(isopropyl)ether	108-20-3	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures		Ingestion, Aquatic Exposures	
		Red-tailed Hawk		Canada Goose	
		NOAEL TRV	Source	NOAEL TRV	Source
2-Hexanone	591-78-6	No TRV		No TRV	
2-Methoxyethanol	109-86-4	No TRV		No TRV	
2-Methyl-2-propanol	75-65-0	No TRV		No TRV	
2-Methyl-2-propenenitrile	126-98-7	No TRV		No TRV	
2-Methylaziridine	75-55-8	No TRV		No TRV	
2-Methylpropyl alcohol	78-83-1	No TRV		No TRV	
2-Pentanone	107-87-9	No TRV		No TRV	
2-Propanone (Acetone)	67-64-1	5.20E+04	EPA 1999[f]	5.20E+04	EPA 1999[f]
2-Propene-1-ol	107-18-6	No TRV		No TRV	
2-Propyl alcohol	67-63-0	No TRV		No TRV	
3-Heptanone	106-35-4	No TRV		No TRV	
3-Methyl-1-butanol	123-51-3	No TRV		No TRV	
3-Methyl-2-butanone	563-80-4	No TRV		No TRV	
3-Pentanone	96-22-0	No TRV		No TRV	
4-Heptanone	123-19-3	No TRV		No TRV	
4-Methyl-2-pentanone	108-10-1	No TRV		No TRV	
4-Methyl-3-penten-2-one	141-79-7	No TRV		No TRV	
5-Methyl-2-hexanone	110-12-3	No TRV		No TRV	
Acetaldehyde	75-07-0	No TRV		No TRV	
Acetamide	60-35-5	No TRV		No TRV	
Acetic acid	64-19-7	No TRV		No TRV	
Acetic acid ethyl ester	141-78-6	No TRV		No TRV	
Acetic acid n-butyl ester	123-86-4	No TRV		No TRV	
Acetonitrile	75-05-8	No TRV		No TRV	
Acrolein	107-02-8	No TRV		No TRV	
Acrylonitrile	107-13-1	No TRV		No TRV	
Bis(isopropyl)ether	108-20-3	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Spotted Sandpiper		Great Blue Heron	
		NOAEL TRV	Source	NOAEL TRV	Source
2-Hexanone	591-78-6	No TRV		No TRV	
2-Methoxyethanol	109-86-4	No TRV		No TRV	
2-Methyl-2-propanol	75-65-0	No TRV		No TRV	
2-Methyl-2-propenenitrile	126-98-7	No TRV		No TRV	
2-Methylaziridine	75-55-8	No TRV		No TRV	
2-Methylpropyl alcohol	78-83-1	No TRV		No TRV	
2-Pentanone	107-87-9	No TRV		No TRV	
2-Propanone (Acetone)	67-64-1	5.20E+04	EPA 1999[f]	5.20E+04	EPA 1999[f]
2-Propene-1-ol	107-18-6	No TRV		No TRV	
2-Propyl alcohol	67-63-0	No TRV		No TRV	
3-Heptanone	106-35-4	No TRV		No TRV	
3-Methyl-1-butanol	123-51-3	No TRV		No TRV	
3-Methyl-2-butanone	563-80-4	No TRV		No TRV	
3-Pentanone	96-22-0	No TRV		No TRV	
4-Heptanone	123-19-3	No TRV		No TRV	
4-Methyl-2-pentanone	108-10-1	No TRV		No TRV	
4-Methyl-3-penten-2-one	141-79-7	No TRV		No TRV	
5-Methyl-2-hexanone	110-12-3	No TRV		No TRV	
Acetaldehyde	75-07-0	No TRV		No TRV	
Acetamide	60-35-5	No TRV		No TRV	
Acetic acid	64-19-7	No TRV		No TRV	
Acetic acid ethyl ester	141-78-6	No TRV		No TRV	
Acetic acid n-butyl ester	123-86-4	No TRV		No TRV	
Acetonitrile	75-05-8	No TRV		No TRV	
Acrolein	107-02-8	No TRV		No TRV	
Acrylonitrile	107-13-1	No TRV		No TRV	
Bis(isopropyl)ether	108-20-3	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Bald Eagle		Mink	
		NOAEL TRV	Source	NOAEL TRV	Source
2-Hexanone	591-78-6	No TRV		No TRV	
2-Methoxyethanol	109-86-4	No TRV		No TRV	
2-Methyl-2-propanol	75-65-0	No TRV		No TRV	
2-Methyl-2-propenenitrile	126-98-7	No TRV		3.40E+01	Pozzani and others (1968) in IRIS (2002)[a]
2-Methylaziridine	75-55-8	No TRV		No TRV	
2-Methylpropyl alcohol	78-83-1	No TRV		3.16E+04	US EPA (1986b) in IRIS (2002)[a]
2-Pentanone	107-87-9	No TRV		No TRV	
2-Propanone (Acetone)	67-64-1	5.20E+04	EPA 1999[f]	1.00E+04	EPA 1999[f]
2-Propene-1-ol	107-18-6	No TRV		4.80E+02	Carpanini and others (1978) in IRIS (2002)[a]
2-Propyl alcohol	67-63-0	No TRV		No TRV	
3-Heptanone	106-35-4	No TRV		No TRV	
3-Methyl-1-butanol	123-51-3	No TRV		No TRV	
3-Methyl-2-butanone	563-80-4	No TRV		No TRV	
3-Pentanone	96-22-0	No TRV		No TRV	
4-Heptanone	123-19-3	No TRV		No TRV	
4-Methyl-2-pentanone	108-10-1	No TRV		2.50E+04	Microbiological Associates (1986) in Sample and others (1996)[c]
4-Methyl-3-penten-2-one	141-79-7	No TRV		No TRV	
5-Methyl-2-hexanone	110-12-3	No TRV		No TRV	
Acetaldehyde	75-07-0	No TRV		No TRV	
Acetamide	60-35-5	No TRV		No TRV	
Acetic acid	64-19-7	No TRV		No TRV	
Acetic acid ethyl ester	141-78-6	No TRV		9.00E+04	US EPA (1986c) in IRIS (2002)[a]
Acetic acid n-butyl ester	123-86-4	No TRV		No TRV	
Acetonitrile	75-05-8	No TRV		No TRV	
Acrolein	107-02-8	No TRV		No TRV	
Acrylonitrile	107-13-1	No TRV		4.60E+02	EPA 1999[f]
Bis(isopropyl)ether	108-20-3	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors			
		Aquatic Biota		Chinook Salmon and Other Salmonids	
		NOAEL TRV	Source	NOAEL TRV	Source
2-Hexanone	591-78-6	9.90E+01	Tier II Chronic (Suter & Tsao 1996)[d]	9.90E+01	Tier II Chronic (Suter & Tsao 1996)[d]
2-Methoxyethanol	109-86-4	No TRV		No TRV	
2-Methyl-2-propanol	75-65-0	No TRV		No TRV	
2-Methyl-2-propenenitrile	126-98-7	No TRV		No TRV	
2-Methylaziridine	75-55-8	No TRV		No TRV	
2-Methylpropyl alcohol	78-83-1	No TRV		No TRV	
2-Pentanone	107-87-9	No TRV		No TRV	
2-Propanone (Acetone)	67-64-1	1.50E+03	EPA 1999[f]	1.26E+01	Acute LOAEL for rainbow trout (AQUIRE[g]) × 0.1 for LOAEL-to-NOAEL conversion × 0.1 for acute-to-chronic conversion
2-Propene-1-ol	107-18-6	No TRV		No TRV	
2-Propyl alcohol	67-63-0	7.50E+00	Tier II Chronic (Suter & Tsao 1996)[d]	7.50E+00	Tier II Chronic (Suter & Tsao 1996)[d]
3-Heptanone	106-35-4	No TRV		No TRV	
3-Methyl-1-butanol	123-51-3	No TRV		No TRV	
3-Methyl-2-butanone	563-80-4	No TRV		No TRV	
3-Pentanone	96-22-0	No TRV		No TRV	
4-Heptanone	123-19-3	No TRV		No TRV	
4-Methyl-2-pentanone	108-10-1	1.70E+02	Tier II Chronic (Suter & Tsao 1996)[d]	1.70E+02	Tier II Chronic (Suter & Tsao 1996)[d]
4-Methyl-3-penten-2-one	141-79-7	No TRV		No TRV	
5-Methyl-2-hexanone	110-12-3	No TRV		No TRV	
Acetaldehyde	75-07-0	No TRV		No TRV	
Acetamide	60-35-5	No TRV		No TRV	
Acetic acid	64-19-7	No TRV		No TRV	
Acetic acid ethyl ester	141-78-6	No TRV		No TRV	
Acetic acid n-butyl ester	123-86-4	No TRV		No TRV	
Acetonitrile	75-05-8	No TRV		No TRV	
Acrolein	107-02-8	2.10E+00	EPA 1987[b]	2.10E+00	EPA 1987[b]
Acrylonitrile	107-13-1	2.60E+02	EPA 1999[f]	2.60E+02	EPA 1999[f]
Bis(isopropyl)ether	108-20-3	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors	
		Benthic Organisms	
		NOAEL TRV	Source
2-Hexanone	591-78-6	8.42E+00	EqP method (Jones and others 1997)[i]
2-Methoxyethanol	109-86-4	No TRV	
2-Methyl-2-propanol	75-65-0	No TRV	
2-Methyl-2-propenenitrile	126-98-7	No TRV	
2-Methylaziridine	75-55-8	No TRV	
2-Methylpropyl alcohol	78-83-1	No TRV	
2-Pentanone	107-87-9	No TRV	
2-Propanone (Acetone)	67-64-1	5.71E+01	EPA 1999[f]
2-Propene-1-ol	107-18-6	No TRV	
2-Propyl alcohol	67-63-0	No TRV	
3-Heptanone	106-35-4	No TRV	
3-Methyl-1-butanol	123-51-3	No TRV	
3-Methyl-2-butanone	563-80-4	No TRV	
3-Pentanone	96-22-0	No TRV	
4-Heptanone	123-19-3	No TRV	
4-Methyl-2-pentanone	108-10-1	8.16E+01	EqP method (Jones and others 1997)[i]
4-Methyl-3-penten-2-one	141-79-7	No TRV	
5-Methyl-2-hexanone	110-12-3	No TRV	
Acetaldehyde	75-07-0	No TRV	
Acetamide	60-35-5	No TRV	
Acetic acid	64-19-7	No TRV	
Acetic acid ethyl ester	141-78-6	No TRV	
Acetic acid n-butyl ester	123-86-4	No TRV	
Acetonitrile	75-05-8	No TRV	
Acrolein	107-02-8	1.17E-01	EqP method (Jones and others 1997)[i]
Acrylonitrile	107-13-1	2.31E+01	EPA 1999[f]
Bis(isopropyl)ether	108-20-3	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Exposure, Terrestrial Receptors			
		Plant		Terrestrial Invertebrate	
		TRV	Source	TRV	Source
Butane	106-97-8	No TRV		No TRV	
Carbon disulfide	75-15-0	No TRV		No TRV	
Cyanogen	460-19-5	No TRV		No TRV	
Cyclohexane	110-82-7	No TRV		No TRV	
Cyclohexanone	108-94-1	No TRV		No TRV	
Cyclohexene	110-83-8	No TRV		No TRV	
Cyclopentane	287-92-3	No TRV		No TRV	
Ethyl alcohol	64-17-5	No TRV		No TRV	
Ethyl ether	60-29-7	No TRV		No TRV	
Ethyl methacrylate	97-63-2	No TRV		No TRV	
Formaldehyde	50-00-0	No TRV		No TRV	
Formamide	75-12-7	No TRV		No TRV	
Formic acid	64-18-6	No TRV		No TRV	
Formic acid, methyl ester	107-31-3	No TRV		No TRV	
Glycidylaldehyde	765-34-4	No TRV		No TRV	
Methyl acetate	79-20-9	No TRV		No TRV	
Methyl alcohol	67-56-1	No TRV		No TRV	
Methyl isocyanate	624-83-9	No TRV		No TRV	
Methyl methacrylate	80-62-6	No TRV		No TRV	
Methyl tert-butyl ether	1634-04-4	No TRV		No TRV	
Methylacetylene	74-99-7	No TRV		No TRV	
Methylcyclohexane	108-87-2	No TRV		No TRV	
N,N-Dimethylacetamide	127-19-5	No TRV		No TRV	
n-Butyl alcohol	71-36-3	No TRV		No TRV	
n-Heptane	142-82-5	1.00E+06	Efroymson and others (1997a)[e]	No TRV	
n-Hexane	110-54-3	No TRV		No TRV	
Nitromethane	75-52-5	No TRV		No TRV	
n-Nonane	111-84-2	No TRV		No TRV	
n-Octane	111-65-9	No TRV		No TRV	
n-Pentane	109-66-0	No TRV		No TRV	
n-Propionaldehyde	123-38-6	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Mule Deer		Mourning Dove	
		NOAEL TRV	Source	NOAEL TRV	Source
Butane	106-97-8	No TRV		No TRV	
Carbon disulfide	75-15-0	1.10E+04	Hardin and others (1981) in IRIS (2002)[a]	No TRV	
Cyanogen	460-19-5	No TRV		No TRV	
Cyclohexane	110-82-7	No TRV		No TRV	
Cyclohexanone	108-94-1	No TRV		No TRV	
Cyclohexene	110-83-8	No TRV		No TRV	
Cyclopentane	287-92-3	No TRV		No TRV	
Ethyl alcohol	64-17-5	No TRV		No TRV	
Ethyl ether	60-29-7	5.00E+04	US EPA (1986d) in IRIS (2002)[a]	No TRV	
Ethyl methacrylate	97-63-2	No TRV		No TRV	
Formaldehyde	50-00-0	2.30E+03	EPA 1999[f]	No TRV	
Formamide	75-12-7	No TRV		No TRV	
Formic acid	64-18-6	No TRV		No TRV	
Formic acid, methyl ester	107-31-3	No TRV		No TRV	
Glycidylaldehyde	765-34-4	1.09E+02	Hine and others (1961) in IRIS (2002)[a]	No TRV	
Methyl acetate	79-20-9	No TRV		No TRV	
Methyl alcohol	67-56-1	5.00E+04	US EPA (1986e) in IRIS (2002)[a]	No TRV	
Methyl isocyanate	624-83-9	No TRV		No TRV	
Methyl methacrylate	80-62-6	1.36E+05	Borzelleca and others (1964) IRIS (2002)[a]	No TRV	
Methyl tert-butyl ether	1634-04-4	No TRV		No TRV	
Methylacetylene	74-99-7	No TRV		No TRV	
Methylcyclohexane	108-87-2	No TRV		No TRV	
N,N-Dimethylacetamide	127-19-5	No TRV		No TRV	
n-Butyl alcohol	71-36-3	1.25E+04	US EPA (1986f) in IRIS (2002)[a]	No TRV	
n-Heptane	142-82-5	No TRV		No TRV	
n-Hexane	110-54-3	No TRV		No TRV	
Nitromethane	75-52-5	No TRV		No TRV	
n-Nonane	111-84-2	No TRV		No TRV	
n-Octane	111-65-9	No TRV		No TRV	
n-Pentane	109-66-0	No TRV		No TRV	
n-Propionaldehyde	123-38-6	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Great Basin Pocket Mouse		Western Meadowlark	
		NOAEL TRV	Source	NOAEL TRV	Source
Butane	106-97-8	No TRV		No TRV	
Carbon disulfide	75-15-0	1.10E+04	Hardin and others (1981) in IRIS (2002)[a]	No TRV	
Cyanogen	460-19-5	No TRV		No TRV	
Cyclohexane	110-82-7	No TRV		No TRV	
Cyclohexanone	108-94-1	No TRV		No TRV	
Cyclohexene	110-83-8	No TRV		No TRV	
Cyclopentane	287-92-3	No TRV		No TRV	
Ethyl alcohol	64-17-5	No TRV		No TRV	
Ethyl ether	60-29-7	5.00E+04	US EPA (1986d) in IRIS (2002)[a]	No TRV	
Ethyl methacrylate	97-63-2	No TRV		No TRV	
Formaldehyde	50-00-0	2.30E+03	EPA 1999[f]	No TRV	
Formamide	75-12-7	No TRV		No TRV	
Formic acid	64-18-6	No TRV		No TRV	
Formic acid, methyl ester	107-31-3	No TRV		No TRV	
Glycidylaldehyde	765-34-4	1.09E+02	Hine and others (1961) in IRIS (2002)[a]	No TRV	
Methyl acetate	79-20-9	No TRV		No TRV	
Methyl alcohol	67-56-1	5.00E+04	US EPA (1986e) in IRIS (2002)[a]	No TRV	
Methyl isocyanate	624-83-9	No TRV		No TRV	
Methyl methacrylate	80-62-6	1.36E+05	Borzelleca and others (1964) IRIS (2002)[a]	No TRV	
Methyl tert-butyl ether	1634-04-4	No TRV		No TRV	
Methylacetylene	74-99-7	No TRV		No TRV	
Methylcyclohexane	108-87-2	No TRV		No TRV	
N,N-Dimethylacetamide	127-19-5	No TRV		No TRV	
n-Butyl alcohol	71-36-3	1.25E+04	US EPA (1986f) in IRIS (2002)[a]	No TRV	
n-Heptane	142-82-5	No TRV		No TRV	
n-Hexane	110-54-3	No TRV		No TRV	
Nitromethane	75-52-5	No TRV		No TRV	
n-Nonane	111-84-2	No TRV		No TRV	
n-Octane	111-65-9	No TRV		No TRV	
n-Pentane	109-66-0	No TRV		No TRV	
n-Propionaldehyde	123-38-6	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Coyote		Burrowing Owl	
		NOAEL TRV	Source	NOAEL TRV	Source
Butane	106-97-8	No TRV		No TRV	
Carbon disulfide	75-15-0	1.10E+04	Hardin and others (1981) in IRIS (2002)[a]	No TRV	
Cyanogen	460-19-5	No TRV		No TRV	
Cyclohexane	110-82-7	No TRV		No TRV	
Cyclohexanone	108-94-1	No TRV		No TRV	
Cyclohexene	110-83-8	No TRV		No TRV	
Cyclopentane	287-92-3	No TRV		No TRV	
Ethyl alcohol	64-17-5	No TRV		No TRV	
Ethyl ether	60-29-7	5.00E+04	US EPA (1986d) in IRIS (2002)[a]	No TRV	
Ethyl methacrylate	97-63-2	No TRV		No TRV	
Formaldehyde	50-00-0	2.30E+03	EPA 1999[f]	No TRV	
Formamide	75-12-7	No TRV		No TRV	
Formic acid	64-18-6	No TRV		No TRV	
Formic acid, methyl ester	107-31-3	No TRV		No TRV	
Glycidylaldehyde	765-34-4	1.09E+02	Hine and others (1961) in IRIS (2002)[a]	No TRV	
Methyl acetate	79-20-9	No TRV		No TRV	
Methyl alcohol	67-56-1	5.00E+04	US EPA (1986e) in IRIS (2002)[a]	No TRV	
Methyl isocyanate	624-83-9	No TRV		No TRV	
Methyl methacrylate	80-62-6	1.36E+05	Borzelleca and others (1964) IRIS (2002)[a]	No TRV	
Methyl tert-butyl ether	1634-04-4	No TRV	Borzelleca and others (1964) IRIS (2002)[a]	No TRV	
Methylacetylene	74-99-7	No TRV	Borzelleca and others (1964) IRIS (2002)[a]	No TRV	
Methylcyclohexane	108-87-2	No TRV	Borzelleca and others (1964) IRIS (2002)[a]	No TRV	
N,N-Dimethylacetamide	127-19-5	No TRV	Borzelleca and others (1964) IRIS (2002)[a]	No TRV	
n-Butyl alcohol	71-36-3	1.25E+04	US EPA (1986f) in IRIS (2002)[a]	No TRV	
n-Heptane	142-82-5	No TRV		No TRV	
n-Hexane	110-54-3	No TRV		No TRV	
Nitromethane	75-52-5	No TRV		No TRV	
n-Nonane	111-84-2	No TRV		No TRV	
n-Octane	111-65-9	No TRV		No TRV	
n-Pentane	109-66-0	No TRV		No TRV	
n-Propionaldehyde	123-38-6	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures		Ingestion, Aquatic Exposures	
		Red-tailed Hawk		Canada Goose	
		NOAEL TRV	Source	NOAEL TRV	Source
Butane	106-97-8	No TRV		No TRV	
Carbon disulfide	75-15-0	No TRV		No TRV	
Cyanogen	460-19-5	No TRV		No TRV	
Cyclohexane	110-82-7	No TRV		No TRV	
Cyclohexanone	108-94-1	No TRV		No TRV	
Cyclohexene	110-83-8	No TRV		No TRV	
Cyclopentane	287-92-3	No TRV		No TRV	
Ethyl alcohol	64-17-5	No TRV		No TRV	
Ethyl ether	60-29-7	No TRV		No TRV	
Ethyl methacrylate	97-63-2	No TRV		No TRV	
Formaldehyde	50-00-0	No TRV		No TRV	
Formamide	75-12-7	No TRV		No TRV	
Formic acid	64-18-6	No TRV		No TRV	
Formic acid, methyl ester	107-31-3	No TRV		No TRV	
Glycidylaldehyde	765-34-4	No TRV		No TRV	
Methyl acetate	79-20-9	No TRV		No TRV	
Methyl alcohol	67-56-1	No TRV		No TRV	
Methyl isocyanate	624-83-9	No TRV		No TRV	
Methyl methacrylate	80-62-6	No TRV		No TRV	
Methyl tert-butyl ether	1634-04-4	No TRV		No TRV	
Methylacetylene	74-99-7	No TRV		No TRV	
Methylcyclohexane	108-87-2	No TRV		No TRV	
N,N-Dimethylacetamide	127-19-5	No TRV		No TRV	
n-Butyl alcohol	71-36-3	No TRV		No TRV	
n-Heptane	142-82-5	No TRV		No TRV	
n-Hexane	110-54-3	No TRV		No TRV	
Nitromethane	75-52-5	No TRV		No TRV	
n-Nonane	111-84-2	No TRV		No TRV	
n-Octane	111-65-9	No TRV		No TRV	
n-Pentane	109-66-0	No TRV		No TRV	
n-Propionaldehyde	123-38-6	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Spotted Sandpiper		Great Blue Heron	
		NOAEL TRV	Source	NOAEL TRV	Source
Butane	106-97-8	No TRV		No TRV	
Carbon disulfide	75-15-0	No TRV		No TRV	
Cyanogen	460-19-5	No TRV		No TRV	
Cyclohexane	110-82-7	No TRV		No TRV	
Cyclohexanone	108-94-1	No TRV		No TRV	
Cyclohexene	110-83-8	No TRV		No TRV	
Cyclopentane	287-92-3	No TRV		No TRV	
Ethyl alcohol	64-17-5	No TRV		No TRV	
Ethyl ether	60-29-7	No TRV		No TRV	
Ethyl methacrylate	97-63-2	No TRV		No TRV	
Formaldehyde	50-00-0	No TRV		No TRV	
Formamide	75-12-7	No TRV		No TRV	
Formic acid	64-18-6	No TRV		No TRV	
Formic acid, methyl ester	107-31-3	No TRV		No TRV	
Glycidylaldehyde	765-34-4	No TRV		No TRV	
Methyl acetate	79-20-9	No TRV		No TRV	
Methyl alcohol	67-56-1	No TRV		No TRV	
Methyl isocyanate	624-83-9	No TRV		No TRV	
Methyl methacrylate	80-62-6	No TRV		No TRV	
Methyl tert-butyl ether	1634-04-4	No TRV		No TRV	
Methylacetylene	74-99-7	No TRV		No TRV	
Methylcyclohexane	108-87-2	No TRV		No TRV	
N,N-Dimethylacetamide	127-19-5	No TRV		No TRV	
n-Butyl alcohol	71-36-3	No TRV		No TRV	
n-Heptane	142-82-5	No TRV		No TRV	
n-Hexane	110-54-3	No TRV		No TRV	
Nitromethane	75-52-5	No TRV		No TRV	
n-Nonane	111-84-2	No TRV		No TRV	
n-Octane	111-65-9	No TRV		No TRV	
n-Pentane	109-66-0	No TRV		No TRV	
n-Propionaldehyde	123-38-6	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Bald Eagle		Mink	
		NOAEL TRV	Source	NOAEL TRV	Source
Butane	106-97-8	No TRV		No TRV	
Carbon disulfide	75-15-0	No TRV		1.10E+04	Hardin and others (1981) in IRIS (2002)[a]
Cyanogen	460-19-5	No TRV		No TRV	
Cyclohexane	110-82-7	No TRV		No TRV	
Cyclohexanone	108-94-1	No TRV		No TRV	
Cyclohexene	110-83-8	No TRV		No TRV	
Cyclopentane	287-92-3	No TRV		No TRV	
Ethyl alcohol	64-17-5	No TRV		No TRV	
Ethyl ether	60-29-7	No TRV		5.00E+04	US EPA (1986d) in IRIS (2002)[a]
Ethyl methacrylate	97-63-2	No TRV		No TRV	
Formaldehyde	50-00-0	No TRV		2.30E+03	EPA 1999[f]
Formamide	75-12-7	No TRV		No TRV	
Formic acid	64-18-6	No TRV		No TRV	
Formic acid, methyl ester	107-31-3	No TRV		No TRV	
Glycidylaldehyde	765-34-4	No TRV		1.09E+02	Hine and others (1961) in IRIS (2002)[a]
Methyl acetate	79-20-9	No TRV		No TRV	
Methyl alcohol	67-56-1	No TRV		5.00E+04	US EPA (1986e) in IRIS (2002)[a]
Methyl isocyanate	624-83-9	No TRV		No TRV	
Methyl methacrylate	80-62-6	No TRV		1.36E+05	Borzelleca and others (1964) IRIS (2002)[a]
Methyl tert-butyl ether	1634-04-4	No TRV		No TRV	
Methylacetylene	74-99-7	No TRV		No TRV	
Methylcyclohexane	108-87-2	No TRV		No TRV	
N,N-Dimethylacetamide	127-19-5	No TRV		No TRV	
n-Butyl alcohol	71-36-3	No TRV		1.25E+04	US EPA (1986f) in IRIS (2002)[a]
n-Heptane	142-82-5	No TRV		No TRV	
n-Hexane	110-54-3	No TRV		No TRV	
Nitromethane	75-52-5	No TRV		No TRV	
n-Nonane	111-84-2	No TRV		No TRV	
n-Octane	111-65-9	No TRV		No TRV	
n-Pentane	109-66-0	No TRV		No TRV	
n-Propionaldehyde	123-38-6	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors			
		Aquatic Biota		Chinook Salmon and Other Salmonids	
		NOAEL TRV	Source	NOAEL TRV	Source
Butane	106-97-8	No TRV		No TRV	
Carbon disulfide	75-15-0	9.20E-01	Tier II Chronic (Suter & Tsao 1996)[d]	9.20E-01	Tier II Chronic (Suter & Tsao 1996)[d]
Cyanogen	460-19-5	No TRV		No TRV	
Cyclohexane	110-82-7	No TRV		No TRV	
Cyclohexanone	108-94-1	No TRV		No TRV	
Cyclohexene	110-83-8	No TRV		No TRV	
Cyclopentane	287-92-3	No TRV		No TRV	
Ethyl alcohol	64-17-5	No TRV		No TRV	
Ethyl ether	60-29-7	No TRV		No TRV	
Ethyl methacrylate	97-63-2	No TRV		No TRV	
Formaldehyde	50-00-0	4.96E+01	EPA 1999[f]	4.96E+01	EPA 1999[f]
Formamide	75-12-7	No TRV		No TRV	
Formic acid	64-18-6	No TRV		No TRV	
Formic acid, methyl ester	107-31-3	No TRV		No TRV	
Glycidylaldehyde	765-34-4	No TRV		No TRV	
Methyl acetate	79-20-9	No TRV		No TRV	
Methyl alcohol	67-56-1	No TRV		No TRV	
Methyl isocyanate	624-83-9	No TRV		No TRV	
Methyl methacrylate	80-62-6	No TRV		No TRV	
Methyl tert-butyl ether	1634-04-4	No TRV		No TRV	
Methylacetylene	74-99-7	No TRV		No TRV	
Methylcyclohexane	108-87-2	No TRV		No TRV	
N,N-Dimethylacetamide	127-19-5	No TRV		No TRV	
n-Butyl alcohol	71-36-3	No TRV		No TRV	
n-Heptane	142-82-5	No TRV		No TRV	
n-Hexane	110-54-3	5.80E-01	Tier II Chronic (Suter & Tsao 1996)[d]	5.80E-01	Tier II Chronic (Suter & Tsao 1996)[d]
Nitromethane	75-52-5	No TRV		No TRV	
n-Nonane	111-84-2	No TRV		No TRV	
n-Octane	111-65-9	No TRV		No TRV	
n-Pentane	109-66-0	No TRV		No TRV	
n-Propionaldehyde	123-38-6	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors	
		Benthic Organisms	
		NOAEL TRV	Source
Butane	106-97-8	No TRV	
Carbon disulfide	75-15-0	1.89E+00	EqP method (Jones and others 1997)[i]
Cyanogen	460-19-5	No TRV	
Cyclohexane	110-82-7	No TRV	
Cyclohexanone	108-94-1	No TRV	
Cyclohexene	110-83-8	No TRV	
Cyclopentane	287-92-3	No TRV	
Ethyl alcohol	64-17-5	No TRV	
Ethyl ether	60-29-7	No TRV	
Ethyl methacrylate	97-63-2	No TRV	
Formaldehyde	50-00-0	5.20E+00	EPA 1999[f]
Formamide	75-12-7	No TRV	
Formic acid	64-18-6	No TRV	
Formic acid, methyl ester	107-31-3	No TRV	
Glycidylaldehyde	765-34-4	No TRV	
Methyl acetate	79-20-9	No TRV	
Methyl alcohol	67-56-1	No TRV	
Methyl isocyanate	624-83-9	No TRV	
Methyl methacrylate	80-62-6	No TRV	
Methyl tert-butyl ether	1634-04-4	No TRV	
Methylacetylene	74-99-7	No TRV	
Methylcyclohexane	108-87-2	No TRV	
N,N-Dimethylacetamide	127-19-5	No TRV	
n-Butyl alcohol	71-36-3	No TRV	
n-Heptane	142-82-5	No TRV	
n-Hexane	110-54-3	No TRV	
Nitromethane	75-52-5	No TRV	
n-Nonane	111-84-2	No TRV	
n-Octane	111-65-9	No TRV	
n-Pentane	109-66-0	No TRV	
n-Propionaldehyde	123-38-6	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Exposure, Terrestrial Receptors			
		Plant		Terrestrial Invertebrate	
		TRV	Source	TRV	Source
n-Propyl alcohol	71-23-8	No TRV		No TRV	
n-Valeraldehyde	110-62-3	No TRV		No TRV	
Oxirane	75-21-8	No TRV		No TRV	
p-Cymene	99-87-6	No TRV		No TRV	
Phosgene	75-44-5	No TRV		No TRV	
Propargyl alcohol	107-19-7	No TRV		No TRV	
Propionic acid	79-09-4	No TRV		No TRV	
Propionitrile	107-12-0	No TRV		No TRV	
Propylene glycol monomethyl ether	107-98-2	No TRV		No TRV	
p-tert-Butyltoluene	98-51-1	No TRV		No TRV	
Triethylamine	121-44-8	No TRV		No TRV	
Trimethylamine	75-50-3	No TRV		No TRV	
Vinyl acetate	108-05-4	No TRV		No TRV	
Non-aromatic Halogenated Hydrocarbons					
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	No TRV		No TRV	
1,1,1,2-Tetrachloroethane	630-20-6	No TRV		No TRV	
1,1,1-Trichloroethane	71-55-6	No TRV		No TRV	
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	No TRV		No TRV	
1,1,2,2-Tetrachloroethane	79-34-5	No TRV		No TRV	
1,1,2,2-Tetrachloroethene	127-18-4	No TRV		No TRV	
1,1,2-Trichloroethane	79-00-5	No TRV		No TRV	
1,1,2-Trichloroethylene	79-01-6	No TRV		No TRV	
1,1-Dichloroethane	75-34-3	No TRV		No TRV	
1,1-Dichloroethene	75-35-4	No TRV		No TRV	
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Mule Deer		Mourning Dove	
		NOAEL TRV	Source	NOAEL TRV	Source
n-Propyl alcohol	71-23-8	No TRV		No TRV	
n-Valeraldehyde	110-62-3	No TRV		No TRV	
Oxirane	75-21-8	No TRV		No TRV	
p-Cymene	99-87-6	No TRV		No TRV	
Phosgene	75-44-5	No TRV		No TRV	
Propargyl alcohol	107-19-7	5.00E+02	US EPA (1987a) in IRIS (2002)[a]	No TRV	
Propionic acid	79-09-4	No TRV		No TRV	
Propionitrile	107-12-0	No TRV		No TRV	
Propylene glycol monomethyl ether	107-98-2	No TRV		No TRV	
p-tert-Butyltoluene	98-51-1	No TRV		No TRV	
Triethylamine	121-44-8	No TRV		No TRV	
Trimethylamine	75-50-3	No TRV		No TRV	
Vinyl acetate	108-05-4	No TRV		No TRV	
Non-aromatic Halogenated Hydrocarbons					
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	No TRV		No TRV	
1,1,1,2-Tetrachloroethane	630-20-6	8.93E+03	NTP (1983a) in IRIS (2002)[a]	No TRV	
1,1,1-Trichloroethane	71-55-6	1.00E+06	Lane and others (1982) in Sample and others (1996)[c]	No TRV	
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	No TRV		No TRV	
1,1,2,2-Tetrachloroethane	79-34-5	No TRV		No TRV	
1,1,2,2-Tetrachloroethene	127-18-4	1.40E+03	Buben and O'Flaherty (1985) in IRIS (2002)[a]	No TRV	
1,1,2-Trichloroethane	79-00-5	No TRV		No TRV	
1,1,2-Trichloroethylene	79-01-6	7.00E+02	Buben and O'Flaherty (1985) in IRIS (2002)[a]	No TRV	
1,1-Dichloroethane	75-34-3	No TRV		No TRV	
1,1-Dichloroethene	75-35-4	3.00E+04	Quast and others (1983) in Sample and others (1996)[c]	No TRV	
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Great Basin Pocket Mouse		Western Meadowlark	
		NOAEL TRV	Source	NOAEL TRV	Source
n-Propyl alcohol	71-23-8	No TRV		No TRV	
n-Valeraldehyde	110-62-3	No TRV		No TRV	
Oxirane	75-21-8	No TRV		No TRV	
p-Cymene	99-87-6	No TRV		No TRV	
Phosgene	75-44-5	No TRV		No TRV	
Propargyl alcohol	107-19-7	5.00E+02	US EPA (1987a) in IRIS (2002)[a]	No TRV	
Propionic acid	79-09-4	No TRV		No TRV	
Propionitrile	107-12-0	No TRV		No TRV	
Propylene glycol monomethyl ether	107-98-2	No TRV		No TRV	
p-tert-Butyltoluene	98-51-1	No TRV		No TRV	
Triethylamine	121-44-8	No TRV		No TRV	
Trimethylamine	75-50-3	No TRV		No TRV	
Vinyl acetate	108-05-4	No TRV		No TRV	
Non-aromatic Halogenated Hydrocarbons					
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	No TRV		No TRV	
1,1,1,2-Tetrachloroethane	630-20-6	8.93E+03	NTP (1983a) in IRIS (2002)[a]	No TRV	
1,1,1-Trichloroethane	71-55-6	1.00E+06	Lane and others (1982) in Sample and others (1996)[c]	No TRV	
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	No TRV		No TRV	
1,1,2,2-Tetrachloroethane	79-34-5	No TRV		No TRV	
1,1,2,2-Tetrachloroethene	127-18-4	1.40E+03	Buben and O'Flaherty (1985) in IRIS (2002)[a]	No TRV	
1,1,2-Trichloroethane	79-00-5	No TRV		No TRV	
1,1,2-Trichloroethylene	79-01-6	7.00E+02	Buben and O'Flaherty (1985) in Sample and others (1996)[c]	No TRV	
1,1-Dichloroethane	75-34-3	No TRV		No TRV	
1,1-Dichloroethene	75-35-4	3.00E+04	Quast and others (1983) in Sample and others (1996)[c]	No TRV	
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Coyote		Burrowing Owl	
		NOAEL TRV	Source	NOAEL TRV	Source
n-Propyl alcohol	71-23-8	No TRV		No TRV	
n-Valeraldehyde	110-62-3	No TRV		No TRV	
Oxirane	75-21-8	No TRV		No TRV	
p-Cymene	99-87-6	No TRV		No TRV	
Phosgene	75-44-5	No TRV		No TRV	
Propargyl alcohol	107-19-7	5.00E+02	US EPA (1987a) in IRIS (2002)[a]	No TRV	
Propionic acid	79-09-4	No TRV		No TRV	
Propionitrile	107-12-0	No TRV		No TRV	
Propylene glycol monomethyl ether	107-98-2	No TRV		No TRV	
p-tert-Butyltoluene	98-51-1	No TRV		No TRV	
Triethylamine	121-44-8	No TRV		No TRV	
Trimethylamine	75-50-3	No TRV		No TRV	
Vinyl acetate	108-05-4	No TRV		No TRV	
Non-aromatic Halogenated Hydrocarbons					
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	No TRV		No TRV	
1,1,1,2-Tetrachloroethane	630-20-6	8.93E+03	NTP (1983a) in IRIS (2002)[a]	No TRV	
1,1,1-Trichloroethane	71-55-6	1.00E+06	Lane and others (1982) in Sample and others (1996)[c]	No TRV	
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	No TRV		No TRV	
1,1,2,2-Tetrachloroethane	79-34-5	No TRV		No TRV	
1,1,2,2-Tetrachloroethene	127-18-4	1.40E+03	Buben and O'Flaherty (1985) in IRIS (2002)[a]	No TRV	
1,1,2-Trichloroethane	79-00-5	No TRV		No TRV	
1,1,2-Trichloroethylene	79-01-6	7.00E+02	Buben and O'Flaherty (1985) in Sample and others (1996)[c]	No TRV	
1,1-Dichloroethane	75-34-3	No TRV		No TRV	
1,1-Dichloroethene	75-35-4	3.00E+04	Quast and others (1983) in Sample and others (1996)[c]	No TRV	
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures		Ingestion, Aquatic Exposures	
		Red-tailed Hawk		Canada Goose	
		NOAEL TRV	Source	NOAEL TRV	Source
n-Propyl alcohol	71-23-8	No TRV		No TRV	
n-Valeraldehyde	110-62-3	No TRV		No TRV	
Oxirane	75-21-8	No TRV		No TRV	
p-Cymene	99-87-6	No TRV		No TRV	
Phosgene	75-44-5	No TRV		No TRV	
Propargyl alcohol	107-19-7	No TRV		No TRV	
Propionic acid	79-09-4	No TRV		No TRV	
Propionitrile	107-12-0	No TRV		No TRV	
Propylene glycol monomethyl ether	107-98-2	No TRV		No TRV	
p-tert-Butyltoluene	98-51-1	No TRV		No TRV	
Triethylamine	121-44-8	No TRV		No TRV	
Trimethylamine	75-50-3	No TRV		No TRV	
Vinyl acetate	108-05-4	No TRV		No TRV	
Non-aromatic Halogenated Hydrocarbons					
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	No TRV		No TRV	
1,1,1,2-Tetrachloroethane	630-20-6	No TRV		No TRV	
1,1,1-Trichloroethane	71-55-6	No TRV		No TRV	
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	No TRV		No TRV	
1,1,2,2-Tetrachloroethane	79-34-5	No TRV		No TRV	
1,1,2,2-Tetrachloroethene	127-18-4	No TRV		No TRV	
1,1,2-Trichloroethane	79-00-5	No TRV		No TRV	
1,1,2-Trichloroethylene	79-01-6	No TRV		No TRV	
1,1-Dichloroethane	75-34-3	No TRV		No TRV	
1,1-Dichloroethene	75-35-4	No TRV		No TRV	
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Spotted Sandpiper		Great Blue Heron	
		NOAEL TRV	Source	NOAEL TRV	Source
n-Propyl alcohol	71-23-8	No TRV		No TRV	
n-Valeraldehyde	110-62-3	No TRV		No TRV	
Oxirane	75-21-8	No TRV		No TRV	
p-Cymene	99-87-6	No TRV		No TRV	
Phosgene	75-44-5	No TRV		No TRV	
Propargyl alcohol	107-19-7	No TRV		No TRV	
Propionic acid	79-09-4	No TRV		No TRV	
Propionitrile	107-12-0	No TRV		No TRV	
Propylene glycol monomethyl ether	107-98-2	No TRV		No TRV	
p-tert-Butyltoluene	98-51-1	No TRV		No TRV	
Triethylamine	121-44-8	No TRV		No TRV	
Trimethylamine	75-50-3	No TRV		No TRV	
Vinyl acetate	108-05-4	No TRV		No TRV	
Non-aromatic Halogenated Hydrocarbons					
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	No TRV		No TRV	
1,1,1,2-Tetrachloroethane	630-20-6	No TRV		No TRV	
1,1,1-Trichloroethane	71-55-6	No TRV		No TRV	
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	No TRV		No TRV	
1,1,2,2-Tetrachloroethane	79-34-5	No TRV		No TRV	
1,1,2,2-Tetrachloroethene	127-18-4	No TRV		No TRV	
1,1,2-Trichloroethane	79-00-5	No TRV		No TRV	
1,1,2-Trichloroethylene	79-01-6	No TRV		No TRV	
1,1-Dichloroethane	75-34-3	No TRV		No TRV	
1,1-Dichloroethene	75-35-4	No TRV		No TRV	
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Bald Eagle		Mink	
		NOAEL TRV	Source	NOAEL TRV	Source
n-Propyl alcohol	71-23-8	No TRV		No TRV	
n-Valeraldehyde	110-62-3	No TRV		No TRV	
Oxirane	75-21-8	No TRV		No TRV	
p-Cymene	99-87-6	No TRV		No TRV	
Phosgene	75-44-5	No TRV		No TRV	
Propargyl alcohol	107-19-7	No TRV		5.00E+02	US EPA (1987a) in IRIS (2002)[a]
Propionic acid	79-09-4	No TRV		No TRV	
Propionitrile	107-12-0	No TRV		No TRV	
Propylene glycol monomethyl ether	107-98-2	No TRV		No TRV	
p-tert-Butyltoluene	98-51-1	No TRV		No TRV	
Triethylamine	121-44-8	No TRV		No TRV	
Trimethylamine	75-50-3	No TRV		No TRV	
Vinyl acetate	108-05-4	No TRV		No TRV	
Non-aromatic Halogenated Hydrocarbons					
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	No TRV		No TRV	
1,1,1,2-Tetrachloroethane	630-20-6	No TRV		8.93E+03	NTP (1983a) in IRIS (2002)[a]
1,1,1-Trichloroethane	71-55-6	No TRV		1.00E+06	Lane and others (1982) in Sample and others (1996)[c]
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	No TRV		No TRV	
1,1,2,2-Tetrachloroethane	79-34-5	No TRV		No TRV	
1,1,2,2-Tetrachloroethene	127-18-4	No TRV		1.40E+03	Buben and O'Flaherty (1985) in IRIS (2002)[a]
1,1,2-Trichloroethane	79-00-5	No TRV		No TRV	
1,1,2-Trichloroethylene	79-01-6	No TRV		7.00E+02	Buben and O'Flaherty (1985) in Sample and others (1996)[c]
1,1-Dichloroethane	75-34-3	No TRV		No TRV	
1,1-Dichloroethene	75-35-4	No TRV		3.00E+04	Quast and others (1983) in Sample and others (1996)[c]
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors			
		Aquatic Biota		Chinook Salmon and Other Salmonids	
		NOAEL TRV	Source	NOAEL TRV	Source
n-Propyl alcohol	71-23-8	No TRV		No TRV	
n-Valeraldehyde	110-62-3	No TRV		No TRV	
Oxirane	75-21-8	No TRV		No TRV	
p-Cymene	99-87-6	No TRV		No TRV	
Phosgene	75-44-5	No TRV		No TRV	
Propargyl alcohol	107-19-7	No TRV		No TRV	
Propionic acid	79-09-4	No TRV		No TRV	
Propionitrile	107-12-0	No TRV		No TRV	
Propylene glycol monomethyl ether	107-98-2	No TRV		No TRV	
p-tert-Butyltoluene	98-51-1	No TRV		No TRV	
Triethylamine	121-44-8	No TRV		No TRV	
Trimethylamine	75-50-3	No TRV		No TRV	
Vinyl acetate	108-05-4	1.60E+01	Tier II Chronic (Suter & Tsao 1996)[d]	1.60E+01	Tier II Chronic (Suter & Tsao 1996)[d]
Non-aromatic Halogenated Hydrocarbons					
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	No TRV		No TRV	
1,1,1,2-Tetrachloroethane	630-20-6	No TRV		No TRV	
1,1,1-Trichloroethane	71-55-6	1.10E+01	Tier II Chronic (Suter & Tsao 1996)[d]	1.10E+01	Tier II Chronic (Suter & Tsao 1996)[d]
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	No TRV		No TRV	
1,1,2,2-Tetrachloroethane	79-34-5	6.10E+02	Tier II Chronic (Suter & Tsao 1996)[d]	6.10E+02	Tier II Chronic (Suter & Tsao 1996)[d]
1,1,2,2-Tetrachloroethene	127-18-4	9.80E+01	Tier II Chronic (Suter & Tsao 1996)[d]	3.16E-02	Acute LOAEL for rainbow trout (Suter and Tsao 1996[d] Table C-1) × 0.1 for LOAEL-to-NOAEL conversion × 0.1 for acute-to-chronic conversion
1,1,2-Trichloroethane	79-00-5	1.20E+03	Tier II Chronic (Suter & Tsao 1996)[d]	1.20E+03	Tier II Chronic (Suter & Tsao 1996)[d]
1,1,2-Trichloroethylene	79-01-6	4.70E+01	Tier II Chronic (Suter & Tsao 1996)[d]	4.70E+01	Tier II Chronic (Suter & Tsao 1996)[d]
1,1-Dichloroethane	75-34-3	4.70E+01	Tier II Chronic (Suter & Tsao 1996)[d]	4.70E+01	Tier II Chronic (Suter & Tsao 1996)[d]
1,1-Dichloroethene	75-35-4	2.50E+01	Tier II Chronic (Suter & Tsao 1996)[d]	2.50E+01	Tier II Chronic (Suter & Tsao 1996)[d]
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors	
		Benthic Organisms	
		NOAEL TRV	Source
n-Propyl alcohol	71-23-8	No TRV	
n-Valeraldehyde	110-62-3	No TRV	
Oxirane	75-21-8	No TRV	
p-Cymene	99-87-6	No TRV	
Phosgene	75-44-5	No TRV	
Propargyl alcohol	107-19-7	No TRV	
Propionic acid	79-09-4	No TRV	
Propionitrile	107-12-0	No TRV	
Propylene glycol monomethyl ether	107-98-2	No TRV	
p-tert-Butyltoluene	98-51-1	No TRV	
Triethylamine	121-44-8	No TRV	
Trimethylamine	75-50-3	No TRV	
Vinyl acetate	108-05-4	3.18E+00	EqP method (Jones and others 1997)[i]
Non-aromatic Halogenated Hydrocarbons			
1,1,1,2-Tetrachloro-2,2-difluoroethane	76-11-9	No TRV	
1,1,1,2-Tetrachloroethane	630-20-6	No TRV	
1,1,1-Trichloroethane	71-55-6	5.94E+04	EqP method (Jones and others 1997)[i]
1,1,2,2-Tetrachloro-1,2-difluoroethane	76-12-0	No TRV	
1,1,2,2-Tetrachloroethane	79-34-5	1.93E+03	EqP method (Jones and others 1997)[i]
1,1,2,2-Tetrachloroethene	127-18-4	1.04E+03	EqP method (Jones and others 1997)[i]
1,1,2-Trichloroethane	79-00-5	3.60E+03	EqP method (Jones and others 1997)[i]
1,1,2-Trichloroethylene	79-01-6	1.77E+02	EqP method (Jones and others 1997)[i]
1,1-Dichloroethane	75-34-3	9.96E+01	EqP method (Jones and others 1997)[i]
1,1-Dichloroethene	75-35-4	6.50E+01	EqP method (Jones and others 1997)[i]
1,2,2-Trichloro-1,1,2-trifluoroethane	76-13-1	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Exposure, Terrestrial Receptors			
		Plant		Terrestrial Invertebrate	
		TRV	Source	TRV	Source
1,2,3-Trichloropropane	96-18-4	No TRV		No TRV	
1,2-Dibromo-3-chloropropane	96-12-8	No TRV		No TRV	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	No TRV		No TRV	
1,2-Dichloroethane	107-06-2	No TRV		No TRV	
1,2-Dichloroethylene	540-59-0	No TRV		No TRV	
1,2-Dichloropropane	78-87-5	No TRV		7.00E+05	Efroymson and others (1997b)[h]
1,3-Dichloropropene	542-75-6	No TRV		No TRV	
1,4-Dichloro-2-butene	764-41-0	No TRV		No TRV	
1-Chloroethene	75-01-4	No TRV		No TRV	
2,2-Dichloropropionic acid	75-99-0	No TRV		No TRV	
2-Chloropropane	75-29-6	No TRV		No TRV	
3-Chloropropene (Allyl chloride)	107-05-1	No TRV		No TRV	
Bromochloromethane	74-97-5	No TRV		No TRV	
Bromodichloromethane	75-27-4	No TRV		No TRV	
Bromoethene	593-60-2	No TRV		No TRV	
Bromoform	75-25-2	No TRV		No TRV	
Bromomethane	74-83-9	No TRV		No TRV	
Carbon tetrachloride	56-23-5	No TRV		No TRV	
Chlorodibromomethane	124-48-1	No TRV		No TRV	
Chlorodifluoromethane	75-45-6	No TRV		No TRV	
Chloroethane	75-00-3	No TRV		No TRV	
Chloroform	67-66-3	No TRV		No TRV	
Chloromethane	74-87-3	No TRV		No TRV	
Chloropentafluoroethane	76-15-3	No TRV		No TRV	
cis-1,2-Dichloroethene	156-59-2	No TRV		No TRV	
cis-1,3-Dichloropropene	10061-01-5	No TRV		No TRV	
Cyanogen bromide	506-68-3	No TRV		No TRV	
Cyanogen chloride	506-77-4	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Mule Deer		Mourning Dove	
		NOAEL TRV	Source	NOAEL TRV	Source
1,2,3-Trichloropropane	96-18-4	5.71E+02	NTP (1983b) in IRIS (2002)[a]	No TRV	
1,2-Dibromo-3-chloropropane	96-12-8	No TRV		No TRV	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	No TRV		No TRV	
1,2-Dichloroethane	107-06-2	5.00E+04	Lane and others (1982) in Sample and others (1996)[c]	1.72E+04	Alumot and others (1976) in Sample and others (1996)[c]
1,2-Dichloroethylene	540-59-0	4.52E+04	Palmer and others (1979) in Sample and others (1996)[c]	No TRV	
1,2-Dichloropropane	78-87-5	No TRV		No TRV	
1,3-Dichloropropene	542-75-6	2.50E+03	Stott and others (1995) in IRIS (2002)[a]	No TRV	
1,4-Dichloro-2-butene	764-41-0	No TRV		No TRV	
1-Chloroethene	75-01-4	1.70E+02	EPA 1999[f]	No TRV	
2,2-Dichloropropionic acid	75-99-0	No TRV		No TRV	
2-Chloropropane	75-29-6	No TRV		No TRV	
3-Chloropropene (Allyl chloride)	107-05-1	No TRV		No TRV	
Bromochloromethane	74-97-5	No TRV		No TRV	
Bromodichloromethane	75-27-4	1.79E+03	NTP (1986) in IRIS (2002)[a]	No TRV	
Bromoethene	593-60-2	No TRV		No TRV	
Bromoform	75-25-2	1.79E+03	NTP (1989) in IRIS (2002)[a]	No TRV	
Bromomethane	74-83-9	1.40E+02	Danse and others (1984) in IRIS (2002)[a]	No TRV	
Carbon tetrachloride	56-23-5	7.10E+01	Bruckner and others (1986) in IRIS (2002)[a]	No TRV	
Chlorodibromomethane	124-48-1	2.14E+03	NTP (1985a) in IRIS (2002)[a]	No TRV	
Chlorodifluoromethane	75-45-6	No TRV		No TRV	
Chloroethane	75-00-3	No TRV		No TRV	
Chloroform	67-66-3	6.00E+04	EPA 1999[f]	No TRV	
Chloromethane	74-87-3	No TRV		No TRV	
Chloropentafluoroethane	76-15-3	No TRV		No TRV	
cis-1,2-Dichloroethene	156-59-2	No TRV		No TRV	
cis-1,3-Dichloropropene	10061-01-5	No TRV		No TRV	
Cyanogen bromide	506-68-3	4.40E+03	Howard and Hanzal (1955) in IRIS (2002)[a]	No TRV	
Cyanogen chloride	506-77-4	2.53E+03	Howard and Hanzal (1955) in IRIS (2002)[a]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Great Basin Pocket Mouse		Western Meadowlark	
		NOAEL TRV	Source	NOAEL TRV	Source
1,2,3-Trichloropropane	96-18-4	5.71E+02	NTP (1983b) in IRIS (2002)[a]	No TRV	
1,2-Dibromo-3-chloropropane	96-12-8	No TRV		No TRV	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	No TRV		No TRV	
1,2-Dichloroethane	107-06-2	5.00E+04	Lane and others (1982) in Sample and others (1996)[c]	1.72E+04	Alumot and others (1976) in Sample and others (1996)[c]
1,2-Dichloroethylene	540-59-0	4.52E+04	Palmer and others (1979) in Sample and others (1996)[c]	No TRV	
1,2-Dichloropropane	78-87-5	No TRV		No TRV	
1,3-Dichloropropene	542-75-6	2.50E+03	Stott and others (1995) in IRIS (2002)[a]	No TRV	
1,4-Dichloro-2-butene	764-41-0	No TRV		No TRV	
1-Chloroethene	75-01-4	1.70E+02	EPA 1999[f]	No TRV	
2,2-Dichloropropionic acid	75-99-0	No TRV		No TRV	
2-Chloropropane	75-29-6	No TRV		No TRV	
3-Chloropropene (Allyl chloride)	107-05-1	No TRV		No TRV	
Bromochloromethane	74-97-5	No TRV		No TRV	
Bromodichloromethane	75-27-4	1.79E+03	NTP (1986) in IRIS (2002)[a]	No TRV	
Bromoethene	593-60-2	No TRV		No TRV	
Bromoform	75-25-2	1.79E+03	NTP (1989) in IRIS (2002)[a]	No TRV	
Bromomethane	74-83-9	1.40E+02	Danse et al (1984) in IRIS (2002)[a]	No TRV	
Carbon tetrachloride	56-23-5	7.10E+01	Bruckner and others (1986) in IRIS (2002)[a]	No TRV	
Chlorodibromomethane	124-48-1	2.14E+03	NTP (1985a) in IRIS (2002)[a]	No TRV	
Chlorodifluoromethane	75-45-6	No TRV		No TRV	
Chloroethane	75-00-3	No TRV		No TRV	
Chloroform	67-66-3	6.00E+04	EPA 1999[f]	No TRV	
Chloromethane	74-87-3	No TRV		No TRV	
Chloropentafluoroethane	76-15-3	No TRV		No TRV	
cis-1,2-Dichloroethene	156-59-2	No TRV		No TRV	
cis-1,3-Dichloropropene	10061-01-5	No TRV		No TRV	
Cyanogen bromide	506-68-3	4.40E+03	Howard and Hanzal (1955) in IRIS (2002)[a]	No TRV	
Cyanogen chloride	506-77-4	2.53E+03	Howard and Hanzal (1955) in IRIS (2002)[a]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Coyote		Burrowing Owl	
		NOAEL TRV	Source	NOAEL TRV	Source
1,2,3-Trichloropropane	96-18-4	5.71E+02	NTP (1983b) in IRIS (2002)[a]	No TRV	
1,2-Dibromo-3-chloropropane	96-12-8	No TRV		No TRV	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	No TRV		No TRV	
1,2-Dichloroethane	107-06-2	5.00E+04	Lane and others (1982) in Sample and others (1996)[c]	1.72E+04	Alumot and others (1976) in Sample and others (1996)[c]
1,2-Dichloroethylene	540-59-0	4.52E+04	Palmer and others (1979) in Sample and others (1996)[c]	No TRV	
1,2-Dichloropropane	78-87-5	No TRV		No TRV	
1,3-Dichloropropene	542-75-6	2.50E+03	Stott and others (1995) in IRIS (2002)[a]	No TRV	
1,4-Dichloro-2-butene	764-41-0	No TRV		No TRV	
1-Chloroethene	75-01-4	1.70E+02	EPA 1999[f]	No TRV	
2,2-Dichloropropionic acid	75-99-0	No TRV		No TRV	
2-Chloropropane	75-29-6	No TRV		No TRV	
3-Chloropropene (Allyl chloride)	107-05-1	No TRV		No TRV	
Bromochloromethane	74-97-5	No TRV		No TRV	
Bromodichloromethane	75-27-4	1.79E+03	NTP (1986) in IRIS (2002)[a]	No TRV	
Bromoethene	593-60-2	No TRV		No TRV	
Bromoform	75-25-2	1.79E+03	NTP (1989) in IRIS (2002)[a]	No TRV	
Bromomethane	74-83-9	1.40E+02	Danse et al (1984) in IRIS (2002)[a]	No TRV	
Carbon tetrachloride	56-23-5	7.10E+01	Bruckner and others (1986) in IRIS (2002)[a]	No TRV	
Chlorodibromomethane	124-48-1	2.14E+03	NTP (1985a) in IRIS (2002)[a]	No TRV	
Chlorodifluoromethane	75-45-6	No TRV		No TRV	
Chloroethane	75-00-3	No TRV		No TRV	
Chloroform	67-66-3	6.00E+04	EPA 1999[f]	No TRV	
Chloromethane	74-87-3	No TRV		No TRV	
Chloropentafluoroethane	76-15-3	No TRV		No TRV	
cis-1,2-Dichloroethene	156-59-2	No TRV		No TRV	
cis-1,3-Dichloropropene	10061-01-5	No TRV		No TRV	
Cyanogen bromide	506-68-3	4.40E+03	Howard and Hanzal (1955) in IRIS (2002)[a]	No TRV	
Cyanogen chloride	506-77-4	2.53E+03	Howard and Hanzal (1955) in IRIS (2002)[a]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures		Ingestion, Aquatic Exposures	
		Red-tailed Hawk		Canada Goose	
		NOAEL TRV	Source	NOAEL TRV	Source
1,2,3-Trichloropropane	96-18-4	No TRV		No TRV	
1,2-Dibromo-3-chloropropane	96-12-8	No TRV		No TRV	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	No TRV		No TRV	
1,2-Dichloroethane	107-06-2	1.72E+04	Alumot and others (1976) in Sample and others (1996)[c]	1.72E+04	Alumot and others (1976) in Sample and others (1996)c
1,2-Dichloroethylene	540-59-0	No TRV		No TRV	
1,2-Dichloropropane	78-87-5	No TRV		No TRV	
1,3-Dichloropropene	542-75-6	No TRV		No TRV	
1,4-Dichloro-2-butene	764-41-0	No TRV		No TRV	
1-Chloroethene	75-01-4	No TRV		No TRV	
2,2-Dichloropropionic acid	75-99-0	No TRV		No TRV	
2-Chloropropane	75-29-6	No TRV		No TRV	
3-Chloropropene (Allyl chloride)	107-05-1	No TRV		No TRV	
Bromochloromethane	74-97-5	No TRV		No TRV	
Bromodichloromethane	75-27-4	No TRV		No TRV	
Bromoethene	593-60-2	No TRV		No TRV	
Bromoform	75-25-2	No TRV		No TRV	
Bromomethane	74-83-9	No TRV		No TRV	
Carbon tetrachloride	56-23-5	No TRV		No TRV	
Chlorodibromomethane	124-48-1	No TRV		No TRV	
Chlorodifluoromethane	75-45-6	No TRV		No TRV	
Chloroethane	75-00-3	No TRV		No TRV	
Chloroform	67-66-3	No TRV		No TRV	
Chloromethane	74-87-3	No TRV		No TRV	
Chloropentafluoroethane	76-15-3	No TRV		No TRV	
cis-1,2-Dichloroethene	156-59-2	No TRV		No TRV	
cis-1,3-Dichloropropene	10061-01-5	No TRV		No TRV	
Cyanogen bromide	506-68-3	No TRV		No TRV	
Cyanogen chloride	506-77-4	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Spotted Sandpiper		Great Blue Heron	
		NOAEL TRV	Source	NOAEL TRV	Source
1,2,3-Trichloropropane	96-18-4	No TRV		No TRV	
1,2-Dibromo-3-chloropropane	96-12-8	No TRV		No TRV	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	No TRV		No TRV	
1,2-Dichloroethane	107-06-2	1.72E+04	Alumot and others (1976) in Sample and others (1996)[c]	1.72E+04	Alumot and others (1976) in Sample and others (1996)[c]
1,2-Dichloroethylene	540-59-0	No TRV		No TRV	
1,2-Dichloropropane	78-87-5	No TRV		No TRV	
1,3-Dichloropropene	542-75-6	No TRV		No TRV	
1,4-Dichloro-2-butene	764-41-0	No TRV		No TRV	
1-Chloroethene	75-01-4	No TRV		No TRV	
2,2-Dichloropropionic acid	75-99-0	No TRV		No TRV	
2-Chloropropane	75-29-6	No TRV		No TRV	
3-Chloropropene (Allyl chloride)	107-05-1	No TRV		No TRV	
Bromochloromethane	74-97-5	No TRV		No TRV	
Bromodichloromethane	75-27-4	No TRV		No TRV	
Bromoethene	593-60-2	No TRV		No TRV	
Bromoform	75-25-2	No TRV		No TRV	
Bromomethane	74-83-9	No TRV		No TRV	
Carbon tetrachloride	56-23-5	No TRV		No TRV	
Chlorodibromomethane	124-48-1	No TRV		No TRV	
Chlorodifluoromethane	75-45-6	No TRV		No TRV	
Chloroethane	75-00-3	No TRV		No TRV	
Chloroform	67-66-3	No TRV		No TRV	
Chloromethane	74-87-3	No TRV		No TRV	
Chloropentafluoroethane	76-15-3	No TRV		No TRV	
cis-1,2-Dichloroethene	156-59-2	No TRV		No TRV	
cis-1,3-Dichloropropene	10061-01-5	No TRV		No TRV	
Cyanogen bromide	506-68-3	No TRV		No TRV	
Cyanogen chloride	506-77-4	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Bald Eagle		Mink	
		NOAEL TRV	Source	NOAEL TRV	Source
1,2,3-Trichloropropane	96-18-4	No TRV		5.71E+02	NTP (1983b) in IRIS (2002)[a]
1,2-Dibromo-3-chloropropane	96-12-8	No TRV		No TRV	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	No TRV		No TRV	
1,2-Dichloroethane	107-06-2	1.72E+04	Alumot and others (1976) in Sample and others (1996)[c]	5.00E+04	Lane and others (1982) in Sample and others (1996)[c]
1,2-Dichloroethylene	540-59-0	No TRV		4.52E+04	Palmer and others (1979) in Sample and others (1996)[c]
1,2-Dichloropropane	78-87-5	No TRV		No TRV	
1,3-Dichloropropene	542-75-6	No TRV		2.50E+03	Stott and others (1995) in IRIS (2002)a
1,4-Dichloro-2-butene	764-41-0	No TRV		No TRV	
1-Chloroethene	75-01-4	No TRV		1.70E+02	EPA 1999[f]
2,2-Dichloropropionic acid	75-99-0	No TRV		No TRV	
2-Chloropropane	75-29-6	No TRV		No TRV	
3-Chloropropene (Allyl chloride)	107-05-1	No TRV		No TRV	
Bromochloromethane	74-97-5	No TRV		No TRV	
Bromodichloromethane	75-27-4	No TRV		1.79E+03	NTP (1986) in IRIS (2002)[a]
Bromoethene	593-60-2	No TRV		No TRV	
Bromoform	75-25-2	No TRV		1.79E+03	NTP (1989) in IRIS (2002)[a]
Bromomethane	74-83-9	No TRV		1.40E+02	Danse et al (1984) in IRIS (2002)[a]
Carbon tetrachloride	56-23-5	No TRV		7.10E+01	Bruckner and others (1986) in IRIS (2002)[a]
Chlorodibromomethane	124-48-1	No TRV		2.14E+03	NTP (1985a) in IRIS (2002)[a]
Chlorodifluoromethane	75-45-6	No TRV		No TRV	
Chloroethane	75-00-3	No TRV		No TRV	
Chloroform	67-66-3	No TRV		6.00E+04	EPA 1999[f]
Chloromethane	74-87-3	No TRV		No TRV	
Chloropentafluoroethane	76-15-3	No TRV		No TRV	
cis-1,2-Dichloroethene	156-59-2	No TRV		No TRV	
cis-1,3-Dichloropropene	10061-01-5	No TRV		No TRV	
Cyanogen bromide	506-68-3	No TRV		4.40E+03	Howard and Hanzal (1955) in IRIS (2002)[a]
Cyanogen chloride	506-77-4	No TRV		2.53E+03	Howard and Hanzal (1955) in IRIS (2002)[a]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors			
		Aquatic Biota		Chinook Salmon and Other Salmonids	
		NOAEL TRV	Source	NOAEL TRV	Source
1,2,3-Trichloropropane	96-18-4	No TRV		No TRV	
1,2-Dibromo-3-chloropropane	96-12-8	No TRV		No TRV	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	No TRV		No TRV	
1,2-Dichloroethane	107-06-2	9.10E+02	Tier II Chronic (Suter & Tsao 1996)[d]	9.10E+02	Tier II Chronic (Suter & Tsao 1996)[d]
1,2-Dichloroethylene	540-59-0	5.90E+02	Tier II Chronic (Suter & Tsao 1996)[d]	5.90E+02	Tier II Chronic (Suter & Tsao 1996)[d]
1,2-Dichloropropane	78-87-5	No TRV		No TRV	
1,3-Dichloropropene	542-75-6	5.50E-02	Tier II Chronic (Suter & Tsao 1996)[d]	5.50E-02	Tier II Chronic (Suter & Tsao 1996)[d]
1,4-Dichloro-2-butene	764-41-0	No TRV		No TRV	
1-Chloroethene	75-01-4	3.88E+03	EPA 1999[f]	3.88E+03	EPA 1999[f]
2,2-Dichloropropionic acid	75-99-0	No TRV		No TRV	
2-Chloropropane	75-29-6	No TRV		No TRV	
3-Chloropropene (Allyl chloride)	107-05-1	No TRV		No TRV	
Bromochloromethane	74-97-5	No TRV		No TRV	
Bromodichloromethane	75-27-4	No TRV		No TRV	
Bromoethene	593-60-2	No TRV		No TRV	
Bromoform	75-25-2	No TRV		No TRV	
Bromomethane	74-83-9	No TRV		No TRV	
Carbon tetrachloride	56-23-5	9.80E+00	Tier II Chronic (Suter & Tsao 1996)[d]	9.80E+00	Tier II Chronic (Suter & Tsao 1996)[d]
Chlorodibromomethane	124-48-1	No TRV		No TRV	
Chlorodifluoromethane	75-45-6	No TRV		No TRV	
Chloroethane	75-00-3	No TRV		No TRV	
Chloroform	67-66-3	2.80E+01	EPA 1999[f]	2.80E+01	EPA 1999[f]
Chloromethane	74-87-3	No TRV		No TRV	
Chloropentafluoroethane	76-15-3	No TRV		No TRV	
cis-1,2-Dichloroethene	156-59-2	No TRV		No TRV	
cis-1,3-Dichloropropene	10061-01-5	No TRV		No TRV	
Cyanogen bromide	506-68-3	No TRV		No TRV	
Cyanogen chloride	506-77-4	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors	
		Benthic Organisms	
		NOAEL TRV	Source
1,2,3-Trichloropropane	96-18-4	No TRV	
1,2-Dibromo-3-chloropropane	96-12-8	No TRV	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	76-14-2	No TRV	
1,2-Dichloroethane	107-06-2	7.13E+02	EqP method (Jones and others 1997)[i]
1,2-Dichloroethylene	540-59-0	6.78E+01	EqP method (Jones and others 1997)[i]
1,2-Dichloropropane	78-87-5	No TRV	
1,3-Dichloropropene	542-75-6	5.94E-02	EqP method (Jones and others 1997)[i]
1,4-Dichloro-2-butene	764-41-0	No TRV	
1-Chloroethene	75-01-4	1.72E+03	EqP method (EPA 1999[f])
2,2-Dichloropropionic acid	75-99-0	No TRV	
2-Chloropropane	75-29-6	No TRV	
3-Chloropropene (Allyl chloride)	107-05-1	No TRV	
Bromochloromethane	74-97-5	No TRV	
Bromodichloromethane	75-27-4	No TRV	
Bromoethene	593-60-2	No TRV	
Bromoform	75-25-2	No TRV	
Bromomethane	74-83-9	No TRV	
Carbon tetrachloride	56-23-5	5.96E+01	EqP method (Jones and others 1997)[i]
Chlorodibromomethane	124-48-1	No TRV	
Chlorodifluoromethane	75-45-6	No TRV	
Chloroethane	75-00-3	No TRV	
Chloroform	67-66-3	5.94E+01	EPA 1999[f]
Chloromethane	74-87-3	No TRV	
Chloropentafluoroethane	76-15-3	No TRV	
cis-1,2-Dichloroethene	156-59-2	No TRV	
cis-1,3-Dichloropropene	10061-01-5	No TRV	
Cyanogen bromide	506-68-3	No TRV	
Cyanogen chloride	506-77-4	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Exposure, Terrestrial Receptors			
		Plant		Terrestrial Invertebrate	
		TRV	Source	TRV	Source
Dichlorodifluoromethane	75-71-8	No TRV		No TRV	
Dichlorofluoromethane	75-43-4	No TRV		No TRV	
Dichloromethane	75-09-2	No TRV		No TRV	
Difluorodibromomethane	75-61-6	No TRV		No TRV	
Hexafluoroacetone	684-16-2	No TRV		No TRV	
Iodomethane	74-88-4	No TRV		No TRV	
Methylene bromide	74-95-3	No TRV		No TRV	
Pentachloroethane	76-01-7	No TRV		No TRV	
trans-1,2-Dichloroethylene	156-60-5	No TRV		No TRV	
trans-1,3-Dichloropropene	10061-02-6	No TRV		No TRV	
Trichloroacetic acid	76-03-9	No TRV		No TRV	
Trichlorofluoroethane	27154-33-2	No TRV		No TRV	
Trichlorofluoromethane	75-69-4	No TRV		No TRV	
Trifluorobromomethane	75-63-8	No TRV		No TRV	
Dioxin and Furan Compounds (PCDDs/PCDFs)					
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	No TRV		No TRV	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No TRV		No TRV	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No TRV		No TRV	
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	No TRV		No TRV	
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No TRV		No TRV	
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	No TRV		No TRV	
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No TRV		No TRV	
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	No TRV		No TRV	
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No TRV		No TRV	
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	No TRV		No TRV	
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No TRV		No TRV	
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No TRV		No TRV	
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Mule Deer		Mourning Dove	
		NOAEL TRV	Source	NOAEL TRV	Source
Dichlorodifluoromethane	75-71-8	1.50E+04	Sherman (1974) in IRIS (2002)[a]	No TRV	
Dichlorofluoromethane	75-43-4	No TRV		No TRV	
Dichloromethane	75-09-2	6.16E+03	National Coffee Association (1982) in IRIS (2002)[a]	No TRV	
Difluorodibromomethane	75-61-6	No TRV		No TRV	
Hexafluoroacetone	684-16-2	No TRV		No TRV	
Iodomethane	74-88-4	No TRV		No TRV	
Methylene bromide	74-95-3	No TRV		No TRV	
Pentachloroethane	76-01-7	No TRV		No TRV	
trans-1,2-Dichloroethylene	156-60-5	1.70E+03	Barnes and others (1985) in IRIS (2002)[a]	No TRV	
trans-1,3-Dichloropropene	10061-02-6	No TRV		No TRV	
Trichloroacetic acid	76-03-9	No TRV		No TRV	
Trichlorofluoroethane	27154-33-2	No TRV		No TRV	
Trichlorofluoromethane	75-69-4	3.49E+04	NCI (1978) in IRIS (2002)[a]	No TRV	
Trifluorobromomethane	75-63-8	No TRV		No TRV	
Dioxin and Furan Compounds (PCDDs/PCDFs)					
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	No TRV		No TRV	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No TRV		No TRV	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No TRV		No TRV	
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	No TRV		No TRV	
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No TRV		No TRV	
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	No TRV		No TRV	
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	1.60E-01	Poiger and others (1989) in Sample and others (1996)[c]	No TRV	
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	No TRV		No TRV	
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No TRV		No TRV	
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	No TRV		No TRV	
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	1.60E-01	Poiger and others (1989) in Sample and others (1996)[c]	No TRV	
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No TRV		No TRV	
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	1.60E-02	Poiger and others (1989) in Sample and others (1996)[c]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Great Basin Pocket Mouse		Western Meadowlark	
		NOAEL TRV	Source	NOAEL TRV	Source
Dichlorodifluoromethane	75-71-8	1.50E+04	Sherman (1974) in IRIS (2002)[a]	No TRV	
Dichlorofluoromethane	75-43-4	No TRV		No TRV	
Dichloromethane	75-09-2	6.16E+03	National Coffee Association (1982) in IRIS (2002)[a]	No TRV	
Difluorodibromomethane	75-61-6	No TRV		No TRV	
Hexafluoroacetone	684-16-2	No TRV		No TRV	
Iodomethane	74-88-4	No TRV		No TRV	
Methylene bromide	74-95-3	No TRV		No TRV	
Pentachloroethane	76-01-7	No TRV		No TRV	
trans-1,2-Dichloroethylene	156-60-5	1.70E+03	Barnes and others (1985) in IRIS (2002)[a]	No TRV	
trans-1,3-Dichloropropene	10061-02-6	No TRV		No TRV	
Trichloroacetic acid	76-03-9	No TRV		No TRV	
Trichlorofluoroethane	27154-33-2	No TRV		No TRV	
Trichlorofluoromethane	75-69-4	3.49E+04	NCI (1978) in IRIS (2002)[a]	No TRV	
Trifluorobromomethane	75-63-8	No TRV		No TRV	
Dioxin and Furan Compounds (PCDDs/PCDFs)					
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	No TRV		No TRV	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No TRV		No TRV	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No TRV		No TRV	
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	No TRV		No TRV	
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No TRV		No TRV	
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	No TRV		No TRV	
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	1.60E-01	Poiger and others (1989) in Sample and others (1996)[c]	No TRV	
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	No TRV		No TRV	
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No TRV		No TRV	
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	No TRV		No TRV	
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	1.60E-01	Poiger and others (1989) in Sample and others (1996)[c]	No TRV	
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No TRV		No TRV	
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	1.60E-02	Poiger and others (1989) in Sample and others (1996)[c]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Coyote		Burrowing Owl	
		NOAEL TRV	Source	NOAEL TRV	Source
Dichlorodifluoromethane	75-71-8	1.50E+04	Sherman (1974) in IRIS (2002)[a]	No TRV	
Dichlorofluoromethane	75-43-4	No TRV		No TRV	
Dichloromethane	75-09-2	6.16E+03	National Coffee Association (1982) in IRIS (2002)[a]	No TRV	
Difluorodibromomethane	75-61-6	No TRV		No TRV	
Hexafluoroacetone	684-16-2	No TRV		No TRV	
Iodomethane	74-88-4	No TRV		No TRV	
Methylene bromide	74-95-3	No TRV		No TRV	
Pentachloroethane	76-01-7	No TRV		No TRV	
trans-1,2-Dichloroethylene	156-60-5	1.70E+03	Barnes and others (1985) in IRIS (2002)[a]	No TRV	
trans-1,3-Dichloropropene	10061-02-6	No TRV		No TRV	
Trichloroacetic acid	76-03-9	No TRV		No TRV	
Trichlorofluoroethane	27154-33-2	No TRV		No TRV	
Trichlorofluoromethane	75-69-4	3.49E+04	NCI (1978) in IRIS (2002)[a]	No TRV	
Trifluorobromomethane	75-63-8	No TRV		No TRV	
Dioxin and Furan Compounds (PCDDs/PCDFs)					
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	No TRV		No TRV	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No TRV		No TRV	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No TRV		No TRV	
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	No TRV		No TRV	
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No TRV		No TRV	
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	No TRV		No TRV	
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	1.60E-01	Poiger and others (1989) in Sample and others (1996)[c]	No TRV	
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	No TRV		No TRV	
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No TRV		No TRV	
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	No TRV		No TRV	
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	1.60E-01	Poiger and others (1989) in Sample and others (1996)[c]	No TRV	
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No TRV		No TRV	
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	1.60E-02	Poiger and others (1989) in Sample and others (1996)[c]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures		Ingestion, Aquatic Exposures	
		Red-tailed Hawk		Canada Goose	
		NOAEL TRV	Source	NOAEL TRV	Source
Dichlorodifluoromethane	75-71-8	No TRV		No TRV	
Dichlorofluoromethane	75-43-4	No TRV		No TRV	
Dichloromethane	75-09-2	No TRV		No TRV	
Difluorodibromomethane	75-61-6	No TRV		No TRV	
Hexafluoroacetone	684-16-2	No TRV		No TRV	
Iodomethane	74-88-4	No TRV		No TRV	
Methylene bromide	74-95-3	No TRV		No TRV	
Pentachloroethane	76-01-7	No TRV		No TRV	
trans-1,2-Dichloroethylene	156-60-5	No TRV		No TRV	
trans-1,3-Dichloropropene	10061-02-6	No TRV		No TRV	
Trichloroacetic acid	76-03-9	No TRV		No TRV	
Trichlorofluoroethane	27154-33-2	No TRV		No TRV	
Trichlorofluoromethane	75-69-4	No TRV		No TRV	
Trifluorobromomethane	75-63-8	No TRV		No TRV	
Dioxin and Furan Compounds (PCDDs/PCDFs)					
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	No TRV		No TRV	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No TRV		No TRV	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No TRV		No TRV	
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	No TRV		No TRV	
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No TRV		No TRV	
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	No TRV		No TRV	
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No TRV		No TRV	
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	No TRV		No TRV	
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No TRV		No TRV	
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	No TRV		No TRV	
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No TRV		No TRV	
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No TRV		No TRV	
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Spotted Sandpiper		Great Blue Heron	
		NOAEL TRV	Source	NOAEL TRV	Source
Dichlorodifluoromethane	75-71-8	No TRV		No TRV	
Dichlorofluoromethane	75-43-4	No TRV		No TRV	
Dichloromethane	75-09-2	No TRV		No TRV	
Difluorodibromomethane	75-61-6	No TRV		No TRV	
Hexafluoroacetone	684-16-2	No TRV		No TRV	
Iodomethane	74-88-4	No TRV		No TRV	
Methylene bromide	74-95-3	No TRV		No TRV	
Pentachloroethane	76-01-7	No TRV		No TRV	
trans-1,2-Dichloroethylene	156-60-5	No TRV		No TRV	
trans-1,3-Dichloropropene	10061-02-6	No TRV		No TRV	
Trichloroacetic acid	76-03-9	No TRV		No TRV	
Trichlorofluoroethane	27154-33-2	No TRV		No TRV	
Trichlorofluoromethane	75-69-4	No TRV		No TRV	
Trifluorobromomethane	75-63-8	No TRV		No TRV	
Dioxin and Furan Compounds (PCDDs/PCDFs)					
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	No TRV		No TRV	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No TRV		No TRV	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No TRV		No TRV	
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	No TRV		No TRV	
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No TRV		No TRV	
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	No TRV		No TRV	
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No TRV		No TRV	
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	No TRV		No TRV	
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No TRV		No TRV	
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	No TRV		No TRV	
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No TRV		No TRV	
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No TRV		No TRV	
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Bald Eagle		Mink	
		NOAEL TRV	Source	NOAEL TRV	Source
Dichlorodifluoromethane	75-71-8	No TRV		1.50E+04	Sherman (1974) in IRIS (2002)[a]
Dichlorofluoromethane	75-43-4	No TRV		No TRV	
Dichloromethane	75-09-2	No TRV		6.16E+03	National Coffee Association (1982) in IRIS (2002)[a]
Difluorodibromomethane	75-61-6	No TRV		No TRV	
Hexafluoroacetone	684-16-2	No TRV		No TRV	
Iodomethane	74-88-4	No TRV		No TRV	
Methylene bromide	74-95-3	No TRV		No TRV	
Pentachloroethane	76-01-7	No TRV		No TRV	
trans-1,2-Dichloroethylene	156-60-5	No TRV		1.70E+03	Barnes and others (1985) in IRIS (2002)[a]
trans-1,3-Dichloropropene	10061-02-6	No TRV		No TRV	
Trichloroacetic acid	76-03-9	No TRV		No TRV	
Trichlorofluoroethane	27154-33-2	No TRV		No TRV	
Trichlorofluoromethane	75-69-4	No TRV		3.49E+04	NCI (1978) in IRIS (2002)[a]
Trifluorobromomethane	75-63-8	No TRV		No TRV	
Dioxin and Furan Compounds (PCDDs/PCDFs)					
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	No TRV		No TRV	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No TRV		No TRV	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No TRV		No TRV	
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	No TRV		No TRV	
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No TRV		No TRV	
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	No TRV		No TRV	
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No TRV		1.60E-01	Poiger and others (1989) in Sample and others (1996)[c]
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	No TRV		No TRV	
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No TRV		No TRV	
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	No TRV		No TRV	
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No TRV		1.60E-01	Poiger and others (1989) in Sample and others (1996)[c]
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No TRV		No TRV	
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No TRV		1.60E-02	Poiger and others (1989) in Sample and others (1996)[c]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors			
		Aquatic Biota		Chinook Salmon and Other Salmonids	
		NOAEL TRV	Source	NOAEL TRV	Source
Dichlorodifluoromethane	75-71-8	No TRV		No TRV	
Dichlorofluoromethane	75-43-4	No TRV		No TRV	
Dichloromethane	75-09-2	2.20E+03	Tier II Chronic (Suter & Tsao 1996)[d]	2.20E+03	Tier II Chronic (Suter & Tsao 1996)[d]
Difluorodibromomethane	75-61-6	No TRV		No TRV	
Hexafluoroacetone	684-16-2	No TRV		No TRV	
Iodomethane	74-88-4	No TRV		No TRV	
Methylene bromide	74-95-3	No TRV		No TRV	
Pentachloroethane	76-01-7	3.90E+01	EPA 1987[b]	3.90E+01	EPA 1987[b]
trans-1,2-Dichloroethylene	156-60-5	No TRV		No TRV	
trans-1,3-Dichloropropene	10061-02-6	No TRV		No TRV	
Trichloroacetic acid	76-03-9	No TRV		No TRV	
Trichlorofluoroethane	27154-33-2	No TRV		No TRV	
Trichlorofluoromethane	75-69-4	No TRV		No TRV	
Trifluorobromomethane	75-63-8	No TRV		No TRV	
Dioxin and Furan Compounds (PCDDs/PCDFs)					
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	No TRV		No TRV	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No TRV		No TRV	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No TRV		No TRV	
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	No TRV		No TRV	
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No TRV		No TRV	
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	No TRV		No TRV	
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No TRV		No TRV	
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	No TRV		No TRV	
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No TRV		No TRV	
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	No TRV		No TRV	
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No TRV		No TRV	
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No TRV		No TRV	
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors	
		Benthic Organisms	
		NOAEL TRV	Source
Dichlorodifluoromethane	75-71-8	No TRV	
Dichlorofluoromethane	75-43-4	No TRV	
Dichloromethane	75-09-2	8.80E+02	EqP method (Jones and others 1997)[i]
Difluorodibromomethane	75-61-6	No TRV	
Hexafluoroacetone	684-16-2	No TRV	
Iodomethane	74-88-4	No TRV	
Methylene bromide	74-95-3	No TRV	
Pentachloroethane	76-01-7	No TRV	
trans-1,2-Dichloroethylene	156-60-5	No TRV	
trans-1,3-Dichloropropene	10061-02-6	No TRV	
Trichloroacetic acid	76-03-9	No TRV	
Trichlorofluoroethane	27154-33-2	No TRV	
Trichlorofluoromethane	75-69-4	No TRV	
Trifluorobromomethane	75-63-8	No TRV	
Dioxin and Furan Compounds (PCDDs/PCDFs)			
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin	35822-46-9	No TRV	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	No TRV	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	No TRV	
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin	39227-28-6	No TRV	
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	No TRV	
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin	57653-85-7	No TRV	
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	No TRV	
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin	19408-74-3	No TRV	
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	No TRV	
1,2,3,7,8-Pentachlorodibenzo(p)dioxin	40321-76-4	No TRV	
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	No TRV	
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	No TRV	
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Exposure, Terrestrial Receptors			
		Plant		Terrestrial Invertebrate	
		TRV	Source	TRV	Source
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	No TRV		5.00E+02	EPA 1999[f]
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No TRV		No TRV	
Dibenzofuran	132-64-9	No TRV		No TRV	
Octachlorodibenzo(p)dioxin	3268-87-9	No TRV		No TRV	
Octachlorodibenzofuran	39001-02-0	No TRV		No TRV	
Total dioxins and dibenzofurans	No CAS #	No TRV		No TRV	
Polychlorinated Biphenyls (PCBs)					
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	No TRV		No TRV	
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	No TRV		No TRV	
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No TRV		No TRV	
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No TRV		No TRV	
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No TRV		No TRV	
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No TRV		No TRV	
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No TRV		No TRV	
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No TRV		No TRV	
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No TRV		No TRV	
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	No TRV		No TRV	
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	No TRV		No TRV	
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No TRV		No TRV	
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No TRV		No TRV	
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No TRV		No TRV	
Polychlorinated biphenyls (PCBs)[j]	1336-36-3	1.00E+04	EPA 1999[f]	2.51E+03	EPA 1999[f]
Phthalates					
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	No TRV		No TRV	
Butylbenzyl phthalate	85-68-7	No TRV		No TRV	
Dibutyl phthalate	84-74-2	2.00E+05	Efroymson and others (1997a)[e]	No TRV	
Diethyl phthalate	84-66-2	1.00E+05	Efroymson and others (1997a)[e]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Mule Deer		Mourning Dove	
		NOAEL TRV	Source	NOAEL TRV	Source
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	1.00E-03	Murray and others (1979) in Sample and others (1996)[e]	1.00E-02	EPA 1999[f]
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No TRV		1.00E-03	McKinney and others (1976) in Sample and others (1996)[e]
Dibenzofuran	132-64-9	No TRV		No TRV	
Octachlorodibenzo(p)dioxin	3268-87-9	No TRV		No TRV	
Octachlorodibenzofuran	39001-02-0	No TRV		No TRV	
Total dioxins and dibenzofurans	No CAS #	No TRV		No TRV	
Polychlorinated Biphenyls (PCBs)					
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	No TRV		No TRV	
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	No TRV		No TRV	
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No TRV		No TRV	
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No TRV		No TRV	
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No TRV		No TRV	
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No TRV		No TRV	
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No TRV		No TRV	
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No TRV		No TRV	
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No TRV		No TRV	
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	No TRV		No TRV	
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	No TRV		No TRV	
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No TRV		No TRV	
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No TRV		No TRV	
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No TRV		No TRV	
Polychlorinated biphenyls (PCBs)[j]	1336-36-3	2.06E-01	EPA 1999[f]	7.20E+01	EPA 1999[f]
Phthalates					
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	6.00E+04	EPA 1999[f]	1.11E+02	EPA 1999[f]
Butylbenzyl phthalate	85-68-7	No TRV		No TRV	
Dibutyl phthalate	84-74-2	5.50E+05	Lamb and others (1987) in Sample and others (1996)[e]	1.11E+02	Peakall (1974) in Sample and others (1996)[e]
Diethyl phthalate	84-66-2	4.58E+06	Lamb and others (1987) in Sample and others (1996)[e]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Great Basin Pocket Mouse		Western Meadowlark	
		NOAEL TRV	Source	NOAEL TRV	Source
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	1.00E-03	Murray and others (1979) in Sample and others (1996)[c]	1.00E-02	EPA 1999[f]
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No TRV		1.00E-03	McKinney and others (1976) in Sample and others (1996)[c]
Dibenzofuran	132-64-9	No TRV		No TRV	
Octachlorodibenzo(p)dioxin	3268-87-9	No TRV		No TRV	
Octachlorodibenzofuran	39001-02-0	No TRV		No TRV	
Total dioxins and dibenzofurans	No CAS #	No TRV		No TRV	
Polychlorinated Biphenyls (PCBs)					
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	No TRV		No TRV	
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	No TRV		No TRV	
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No TRV		No TRV	
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No TRV		No TRV	
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No TRV		No TRV	
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No TRV		No TRV	
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No TRV		No TRV	
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No TRV		No TRV	
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No TRV		No TRV	
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	No TRV		No TRV	
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	No TRV		No TRV	
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No TRV		No TRV	
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No TRV		No TRV	
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No TRV		No TRV	
Polychlorinated biphenyls (PCBs)[j]	1336-36-3	2.06E-01	EPA 1999[f]	7.20E+01	EPA 1999[f]
Phthalates					
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	6.00E+04	EPA 1999[f]	1.11E+02	EPA 1999[f]
Butylbenzyl phthalate	85-68-7	No TRV		No TRV	EPA 1999[f]
Dibutyl phthalate	84-74-2	5.50E+05	Lamb and others (1987) in Sample and others (1996)[c]	1.11E+02	Peakall (1974) in Sample and others (1996)[c]
Diethyl phthalate	84-66-2	4.58E+06	Lamb and others (1987) in Sample and others (1996)[c]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Coyote		Burrowing Owl	
		NOAEL TRV	Source	NOAEL TRV	Source
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	1.00E-03	Murray and others (1979) in Sample and others (1996)[e]	1.00E-02	EPA 1999[f]
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No TRV		1.00E-03	McKinney and others (1976) in Sample and others (1996)[e]
Dibenzofuran	132-64-9	No TRV		No TRV	
Octachlorodibenzo(p)dioxin	3268-87-9	No TRV		No TRV	
Octachlorodibenzofuran	39001-02-0	No TRV		No TRV	
Total dioxins and dibenzofurans	No CAS #	No TRV		No TRV	
Polychlorinated Biphenyls (PCBs)					
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	No TRV		No TRV	
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	No TRV		No TRV	
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No TRV		No TRV	
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No TRV		No TRV	
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No TRV		No TRV	
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No TRV		No TRV	
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No TRV		No TRV	
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No TRV		No TRV	
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No TRV		No TRV	
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	No TRV		No TRV	
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	No TRV		No TRV	
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No TRV		No TRV	
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No TRV		No TRV	
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No TRV		No TRV	
Polychlorinated biphenyls (PCBs)[j]	1336-36-3	2.06E-01	EPA 1999[f]	7.20E+01	EPA 1999[f]
Phthalates					
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	6.00E+04	EPA 1999[f]	1.11E+02	EPA 1999[f]
Butylbenzyl phthalate	85-68-7	No TRV		No TRV	EPA 1999[f]
Dibutyl phthalate	84-74-2	5.50E+05	Lamb and others (1987) in Sample and others (1996)[e]	1.11E+02	Peakall (1974) in Sample and others (1996)[e]
Diethyl phthalate	84-66-2	4.58E+06	Lamb and others (1987) in Sample and others (1996)[e]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures		Ingestion, Aquatic Exposures	
		Red-tailed Hawk		Canada Goose	
		NOAEL TRV	Source	NOAEL TRV	Source
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	1.00E-02	EPA 1999[f]	1.00E-02	EPA 1999[f]
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	1.00E-03	McKinney and others (1976) in Sample and others (1996)[e]	1.00E-03	McKinney and others (1976) in Sample and others (1996)[e]
Dibenzofuran	132-64-9	No TRV		No TRV	
Octachlorodibenzo(p)dioxin	3268-87-9	No TRV		No TRV	
Octachlorodibenzofuran	39001-02-0	No TRV		No TRV	
Total dioxins and dibenzofurans	No CAS #	No TRV		No TRV	
Polychlorinated Biphenyls (PCBs)					
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	No TRV		No TRV	
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	No TRV		No TRV	
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No TRV		No TRV	
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No TRV		No TRV	
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No TRV		No TRV	
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No TRV		No TRV	
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No TRV		No TRV	
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No TRV		No TRV	
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No TRV		No TRV	
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	No TRV		No TRV	
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	No TRV		No TRV	
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No TRV		No TRV	
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No TRV		No TRV	
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No TRV		No TRV	
Polychlorinated biphenyls (PCBs)[j]	1336-36-3	7.20E+01	EPA 1999[f]	7.20E+01	EPA 1999[f]
Phthalates					
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	1.11E+02	EPA 1999[f]	1.11E+02	EPA 1999[f]
Butylbenzyl phthalate	85-68-7	No TRV	EPA 1999[f]	No TRV	EPA 1999[f]
Dibutyl phthalate	84-74-2	1.11E+02	Peakall (1974) in Sample and others (1996)[e]	1.11E+02	Peakall (1974) in Sample and others (1996)[e]
Diethyl phthalate	84-66-2	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Spotted Sandpiper		Great Blue Heron	
		NOAEL TRV	Source	NOAEL TRV	Source
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	1.00E-02	EPA 1999[f]	1.00E-02	EPA 1999[f]
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	1.00E-03	McKinney and others (1976) in Sample and others (1996)[c]	1.00E-03	McKinney and others (1976) in Sample and others (1996)[c]
Dibenzofuran	132-64-9	No TRV		No TRV	
Octachlorodibenzo(p)dioxin	3268-87-9	No TRV		No TRV	
Octachlorodibenzofuran	39001-02-0	No TRV		No TRV	
Total dioxins and dibenzofurans	No CAS #	No TRV		No TRV	
Polychlorinated Biphenyls (PCBs)					
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	No TRV		No TRV	
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	No TRV		No TRV	
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No TRV		No TRV	
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No TRV		No TRV	
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No TRV		No TRV	
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No TRV		No TRV	
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No TRV		No TRV	
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No TRV		No TRV	
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No TRV		No TRV	
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	No TRV		No TRV	
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	No TRV		No TRV	
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No TRV		No TRV	
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No TRV		No TRV	
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No TRV		No TRV	
Polychlorinated biphenyls (PCBs)[j]	1336-36-3	7.20E+01	EPA 1999[f]	7.20E+01	EPA 1999[f]
Phthalates					
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	1.11E+02	EPA 1999[f]	1.11E+02	EPA 1999[f]
Butylbenzyl phthalate	85-68-7	No TRV	EPA 1999[f]	No TRV	EPA 1999[f]
Dibutyl phthalate	84-74-2	1.11E+02	Peakall (1974) in Sample and others (1996)[c]	1.11E+02	Peakall (1974) in Sample and others (1996)[c]
Diethyl phthalate	84-66-2	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Bald Eagle		Mink	
		NOAEL TRV	Source	NOAEL TRV	Source
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	1.00E-02	EPA 1999[f]	1.00E-03	Murray and others (1979) in Sample and others (1996)[c]
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	1.00E-03	McKinney and others (1976) in Sample and others (1996)[c]	No TRV	
Dibenzofuran	132-64-9	No TRV		No TRV	
Octachlorodibenzo(p)dioxin	3268-87-9	No TRV		No TRV	
Octachlorodibenzofuran	39001-02-0	No TRV		No TRV	
Total dioxins and dibenzofurans	No CAS #	No TRV		No TRV	
Polychlorinated Biphenyls (PCBs)					
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	No TRV		No TRV	
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	No TRV		No TRV	
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No TRV		No TRV	
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No TRV		No TRV	
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No TRV		No TRV	
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No TRV		No TRV	
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No TRV		No TRV	
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No TRV		No TRV	
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No TRV		No TRV	
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	No TRV		No TRV	
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	No TRV		No TRV	
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No TRV		No TRV	
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No TRV		No TRV	
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No TRV		No TRV	
Polychlorinated biphenyls (PCBs)[j]	1336-36-3	7.20E+01	EPA 1999[f]	2.06E-01	EPA 1999[f]
Phthalates					
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	1.11E+02	EPA 1999[f]	6.00E+04	EPA 1999[f]
Butylbenzyl phthalate	85-68-7	No TRV	EPA 1999[f]	No TRV	
Dibutyl phthalate	84-74-2	1.11E+02	Peakall (1974) in Sample and others (1996)[c]	5.50E+05	Lamb and others (1987) in Sample and others (1996)[c]
Diethyl phthalate	84-66-2	No TRV		4.58E+06	Lamb and others (1987) in Sample and others (1996)[c]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors			
		Aquatic Biota		Chinook Salmon and Other Salmonids	
		NOAEL TRV	Source	NOAEL TRV	Source
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	3.80E-06	EPA 1999[f]	3.80E-06	EPA 1999[f]
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No TRV		No TRV	
Dibenzofuran	132-64-9	3.70E+00	Tier II Chronic (Suter & Tsao 1996)[d]	3.70E+00	Tier II Chronic (Suter & Tsao 1996)[d]
Octachlorodibenzo(p)dioxin	3268-87-9	No TRV		No TRV	
Octachlorodibenzofuran	39001-02-0	No TRV		No TRV	
Total dioxins and dibenzofurans	No CAS #	No TRV		No TRV	
	Polychlorinated Biphenyls (PCBs)				
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	No TRV		No TRV	
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	No TRV		No TRV	
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No TRV		No TRV	
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No TRV		No TRV	
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No TRV		No TRV	
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No TRV		No TRV	
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No TRV		No TRV	
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No TRV		No TRV	
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No TRV		No TRV	
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	No TRV		No TRV	
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	No TRV		No TRV	
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No TRV		No TRV	
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No TRV		No TRV	
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No TRV		No TRV	
Polychlorinated biphenyls (PCBs)[j]	1336-36-3	1.40E-01	Tier II Chronic (Suter & Tsao 1996)[d]	1.40E-01	Tier II Chronic (Suter & Tsao 1996)[d]
	Phthalates				
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	3.00E+00	EPA 1999[f]	3.00E+00	EPA 1999[f]
Butylbenzyl phthalate	85-68-7	1.90E+01	Tier II Chronic (Suter & Tsao 1996)[d]	1.90E+01	Tier II Chronic (Suter & Tsao 1996)[d]
Dibutyl phthalate	84-74-2	3.50E+01	Tier II Chronic (Suter & Tsao 1996)[d]	3.50E+01	Tier II Chronic (Suter & Tsao 1996)[d]
Diethyl phthalate	84-66-2	2.10E+02	Tier II Chronic (Suter & Tsao 1996)[d]	2.10E+02	Tier II Chronic (Suter & Tsao 1996)[d]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors	
		Benthic Organisms	
		NOAEL TRV	Source
2,3,7,8-Tetrachlorodibenzo(p)dioxin	1746-01-6	4.10E-01	EPA 1999[f]
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	No TRV	
Dibenzofuran	132-64-9	3.20E+04	Ecology (1994) in EPA (1999a)
Octachlorodibenzo(p)dioxin	3268-87-9	No TRV	
Octachlorodibenzofuran	39001-02-0	No TRV	
Total dioxins and dibenzofurans	No CAS #	No TRV	
Polychlorinated Biphenyls (PCBs)			
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	No TRV	
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	No TRV	
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	No TRV	
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	No TRV	
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	No TRV	
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	No TRV	
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	No TRV	
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	No TRV	
2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	No TRV	
2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	No TRV	
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	No TRV	
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	No TRV	
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	No TRV	
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	No TRV	
Polychlorinated biphenyls (PCBs)[j]	1336-36-3	7.00E+01	Persaud and others (1993)[k]
Phthalates			
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	1.33E+04	EPA 1999[f]
Butylbenzyl phthalate	85-68-7	1.04E+04	EqP method (Jones and others 1997)[i]
Dibutyl phthalate	84-74-2	2.20E+03	EPA 1999[f]
Diethyl phthalate	84-66-2	6.89E+02	EqP method (Jones and others 1997)[i]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Exposure, Terrestrial Receptors			
		Plant		Terrestrial Invertebrate	
		TRV	Source	TRV	Source
Dimethyl phthalate	131-11-3	No TRV		2.00E+05	Efroymson and others (1997b)[h]
n-Dioctyl phthalate	117-84-0	No TRV		No TRV	
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)					
2-Chloronaphthalene	91-58-7	No TRV		No TRV	
2-Methyl naphthalene	91-57-6	No TRV		No TRV	
5-Nitroacenaphthene	602-87-9	No TRV		No TRV	
Acenaphthene	83-32-9	2.00E+04	Efroymson and others (1997a)[e]	No TRV	
Acenaphthylene	208-96-8	No TRV		No TRV	
Anthracene	120-12-7	No TRV		No TRV	
Fluorene	86-73-7	No TRV		3.00E+04	Efroymson and others (1997b)[h]
Indene	95-13-6	No TRV		No TRV	
Naphthalene	91-20-3	No TRV		No TRV	
Phenanthrene	85-01-8	No TRV		No TRV	
Pyrene	129-00-0	No TRV		No TRV	
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)					
3-Methylcholanthrene	56-49-5	No TRV		No TRV	
5-Methylchrysene	3697-24-3	No TRV		No TRV	
Benzo[a]anthracene	56-55-3	1.20E+03	EPA 1999[f]	2.50E+04	EPA 1999[f]
Benzo[a]pyrene	50-32-8	1.20E+03	EPA 1999[f]	2.50E+04	EPA 1999[f]
Benzo[a,i]pyrene	191-30-0	No TRV		No TRV	
Benzo[b]fluoranthene	205-99-2	1.20E+03	EPA 1999[f]	2.50E+04	EPA 1999[f]
Benzo[e]pyrene	192-97-2	No TRV		No TRV	
Benzo[g,h,i]perylene	191-24-2	No TRV		No TRV	
Benzo[j]fluoranthene	205-82-3	No TRV		No TRV	
Benzo[k]fluoranthene	207-08-9	1.20E+03	EPA 1999[f]	2.50E+04	EPA 1999[f]
Chrysene	218-01-9	1.20E+03	EPA 1999[f]	2.50E+04	EPA 1999[f]
Dibenz[a,h]acridine	226-36-8	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Mule Deer		Mourning Dove	
		NOAEL TRV	Source	NOAEL TRV	Source
Dimethyl phthalate	131-11-3	No TRV		No TRV	
n-Dioctyl phthalate	117-84-0	7.50E+06	EPA 1999[f]	No TRV	
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)					
2-Chloronaphthalene	91-58-7	2.50E+05	US EPA (1989a) in IRIS (2002)[a]	No TRV	
2-Methyl naphthalene	91-57-6	No TRV		No TRV	
5-Nitroacenaphthene	602-87-9	No TRV		No TRV	
Acenaphthene	83-32-9	1.75E+04	US EPA (1989b) in IRIS (2002)[a]	No TRV	
Acenaphthylene	208-96-8	No TRV		No TRV	
Anthracene	120-12-7	1.00E+05	US EPA (1989c) in IRIS (2002)[a]	No TRV	
Fluorene	86-73-7	1.25E+04	US EPA (1989d) in IRIS (2002)[a]	No TRV	
Indene	95-13-6	No TRV		No TRV	
Naphthalene	91-20-3	7.10E+03	BCL (1980) in IRIS (2002)[a]	No TRV	
Phenanthrene	85-01-8	No TRV		No TRV	
Pyrene	129-00-0	7.50E+03	US EPA (1989e) in IRIS (2002)[a]	No TRV	
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)					
3-Methylcholanthrene	56-49-5	No TRV		No TRV	
5-Methylchrysene	3697-24-3	No TRV		No TRV	
Benzo[a]anthracene	56-55-3	1.67E+02	EPA 1999[f]	7.90E-01	EPA 1999[f]
Benzo[a]pyrene	50-32-8	1.00E+02	EPA 1999[f]	1.00E+00	EPA 1999[f]
Benzo[a,i]pyrene	191-30-0	No TRV		No TRV	
Benzo[b]fluoranthene	205-99-2	No TRV		1.40E-01	EPA 1999[f]
Benzo[e]pyrene	192-97-2	No TRV		No TRV	
Benzo[g,h,i]perylene	191-24-2	No TRV		No TRV	
Benzo[j]fluoranthene	205-82-3	No TRV		No TRV	
Benzo[k]fluoranthene	207-08-9	No TRV		1.40E-01	EPA 1999[f]
Chrysene	218-01-9	No TRV		1.00E+00	EPA 1999[f]
Dibenz[a,h]acridine	226-36-8	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Great Basin Pocket Mouse		Western Meadowlark	
		NOAEL TRV	Source	NOAEL TRV	Source
Dimethyl phthalate	131-11-3	No TRV		No TRV	
n-Dioctyl phthalate	117-84-0	7.50E+06	EPA 1999[f]	No TRV	
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)					
2-Chloronaphthalene	91-58-7	2.50E+05	US EPA (1989a) in IRIS (2002)[a]	No TRV	
2-Methyl naphthalene	91-57-6	No TRV		No TRV	
5-Nitroacenaphthene	602-87-9	No TRV		No TRV	
Acenaphthene	83-32-9	1.75E+04	US EPA (1989b) in IRIS (2002)[a]	No TRV	
Acenaphthylene	208-96-8	No TRV		No TRV	
Anthracene	120-12-7	1.00E+05	US EPA (1989c) in IRIS (2002)[a]	No TRV	
Fluorene	86-73-7	1.25E+04	US EPA (1989d) in IRIS (2002)[a]	No TRV	
Indene	95-13-6	No TRV		No TRV	
Naphthalene	91-20-3	7.10E+03	BCL (1980) in IRIS (2002)[a]	No TRV	
Phenanthrene	85-01-8	No TRV		No TRV	
Pyrene	129-00-0	7.50E+03	US EPA (1989e) in IRIS (2002)[a]	No TRV	
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)					
3-Methylcholanthrene	56-49-5	No TRV		No TRV	
5-Methylchrysene	3697-24-3	No TRV		No TRV	
Benzo[a]anthracene	56-55-3	1.67E+02	EPA 1999[f]	7.90E-01	EPA 1999[f]
Benzo[a]pyrene	50-32-8	1.00E+02	EPA 1999[f]	1.00E+00	EPA 1999[f]
Benzo[a,i]pyrene	191-30-0	No TRV		No TRV	
Benzo[b]fluoranthene	205-99-2	No TRV		1.40E-01	EPA 1999[f]
Benzo[e]pyrene	192-97-2	No TRV		No TRV	
Benzo[g,h,i]perylene	191-24-2	No TRV		No TRV	
Benzo[j]fluoranthene	205-82-3	No TRV		No TRV	
Benzo[k]fluoranthene	207-08-9	No TRV		1.40E-01	EPA 1999[f]
Chrysene	218-01-9	No TRV		1.00E+00	EPA 1999[f]
Dibenz[a,h]acridine	226-36-8	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Coyote		Burrowing Owl	
		NOAEL TRV	Source	NOAEL TRV	Source
Dimethyl phthalate	131-11-3	No TRV		No TRV	
n-Dioctyl phthalate	117-84-0	7.50E+06	EPA 1999[f]	No TRV	
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)					
2-Chloronaphthalene	91-58-7	2.50E+05	US EPA (1989a) in IRIS (2002)[a]	No TRV	
2-Methyl naphthalene	91-57-6	No TRV		No TRV	
5-Nitroacenaphthene	602-87-9	No TRV		No TRV	
Acenaphthene	83-32-9	1.75E+04	US EPA (1989b) in IRIS (2002)[a]	No TRV	
Acenaphthylene	208-96-8	No TRV		No TRV	
Anthracene	120-12-7	1.00E+05	US EPA (1989c) in IRIS (2002)[a]	No TRV	
Fluorene	86-73-7	1.25E+04	US EPA (1989d) in IRIS (2002)[a]	No TRV	
Indene	95-13-6	No TRV		No TRV	
Naphthalene	91-20-3	7.10E+03	BCL (1980) in IRIS (2002)[a]	No TRV	
Phenanthrene	85-01-8	No TRV		No TRV	
Pyrene	129-00-0	7.50E+03	US EPA (1989e) in IRIS (2002)[a]	No TRV	
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)					
3-Methylcholanthrene	56-49-5	No TRV		No TRV	
5-Methylchrysene	3697-24-3	No TRV		No TRV	
Benzo[a]anthracene	56-55-3	1.67E+02	EPA 1999[f]	7.90E-01	EPA 1999[f]
Benzo[a]pyrene	50-32-8	1.00E+02	EPA 1999[f]	1.00E+00	EPA 1999[f]
Benzo[a,i]pyrene	191-30-0	No TRV		No TRV	
Benzo[b]fluoranthene	205-99-2	No TRV		1.40E-01	EPA 1999[f]
Benzo[e]pyrene	192-97-2	No TRV		No TRV	
Benzo[g,h,i]perylene	191-24-2	No TRV		No TRV	
Benzo[j]fluoranthene	205-82-3	No TRV		No TRV	
Benzo[k]fluoranthene	207-08-9	No TRV		1.40E-01	EPA 1999[f]
Chrysene	218-01-9	No TRV		1.00E+00	EPA 1999[f]
Dibenz[a,h]acridine	226-36-8	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures		Ingestion, Aquatic Exposures	
		Red-tailed Hawk		Canada Goose	
		NOAEL TRV	Source	NOAEL TRV	Source
Dimethyl phthalate	131-11-3	No TRV		No TRV	
n-Dioctyl phthalate	117-84-0	No TRV		No TRV	
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)					
2-Chloronaphthalene	91-58-7	No TRV		No TRV	
2-Methyl naphthalene	91-57-6	No TRV		No TRV	
5-Nitroacenaphthene	602-87-9	No TRV		No TRV	
Acenaphthene	83-32-9	No TRV		No TRV	
Acenaphthylene	208-96-8	No TRV		No TRV	
Anthracene	120-12-7	No TRV		No TRV	
Fluorene	86-73-7	No TRV		No TRV	
Indene	95-13-6	No TRV		No TRV	
Naphthalene	91-20-3	No TRV		No TRV	
Phenanthrene	85-01-8	No TRV		No TRV	
Pyrene	129-00-0	No TRV		No TRV	
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)					
3-Methylcholanthrene	56-49-5	No TRV		No TRV	
5-Methylchrysene	3697-24-3	No TRV		No TRV	
Benzo[a]anthracene	56-55-3	7.90E-01	EPA 1999[f]	7.90E-01	EPA 1999[f]
Benzo[a]pyrene	50-32-8	1.00E+00	EPA 1999[f]	1.00E+00	EPA 1999[f]
Benzo[a,i]pyrene	191-30-0	No TRV		No TRV	
Benzo[b]fluoranthene	205-99-2	1.40E-01	EPA 1999[f]	1.40E-01	EPA 1999[f]
Benzo[e]pyrene	192-97-2	No TRV		No TRV	
Benzo[g,h,i]perylene	191-24-2	No TRV		No TRV	
Benzo[j]fluoranthene	205-82-3	No TRV		No TRV	
Benzo[k]fluoranthene	207-08-9	1.40E-01	EPA 1999[f]	1.40E-01	EPA 1999[f]
Chrysene	218-01-9	1.00E+00	EPA 1999[f]	1.00E+00	EPA 1999[f]
Dibenz[a,h]acridine	226-36-8	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Spotted Sandpiper		Great Blue Heron	
		NOAEL TRV	Source	NOAEL TRV	Source
Dimethyl phthalate	131-11-3	No TRV		No TRV	
n-Dioctyl phthalate	117-84-0	No TRV		No TRV	
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)					
2-Chloronaphthalene	91-58-7	No TRV		No TRV	
2-Methyl naphthalene	91-57-6	No TRV		No TRV	
5-Nitroacenaphthene	602-87-9	No TRV		No TRV	
Acenaphthene	83-32-9	No TRV		No TRV	
Acenaphthylene	208-96-8	No TRV		No TRV	
Anthracene	120-12-7	No TRV		No TRV	
Fluorene	86-73-7	No TRV		No TRV	
Indene	95-13-6	No TRV		No TRV	
Naphthalene	91-20-3	No TRV		No TRV	
Phenanthrene	85-01-8	No TRV		No TRV	
Pyrene	129-00-0	No TRV		No TRV	
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)					
3-Methylcholanthrene	56-49-5	No TRV		No TRV	
5-Methylchrysene	3697-24-3	No TRV		No TRV	
Benzo[a]anthracene	56-55-3	7.90E-01	EPA 1999[f]	7.90E-01	EPA 1999[f]
Benzo[a]pyrene	50-32-8	1.00E+00	EPA 1999[f]	1.00E+00	EPA 1999[f]
Benzo[a,i]pyrene	191-30-0	No TRV		No TRV	
Benzo[b]fluoranthene	205-99-2	1.40E-01	EPA 1999[f]	1.40E-01	EPA 1999[f]
Benzo[e]pyrene	192-97-2	No TRV		No TRV	
Benzo[g,h,i]perylene	191-24-2	No TRV		No TRV	
Benzo[j]fluoranthene	205-82-3	No TRV		No TRV	
Benzo[k]fluoranthene	207-08-9	1.40E-01	EPA 1999[f]	1.40E-01	EPA 1999[f]
Chrysene	218-01-9	1.00E+00	EPA 1999[f]	1.00E+00	EPA 1999[f]
Dibenz[a,h]acridine	226-36-8	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Bald Eagle		Mink	
		NOAEL TRV	Source	NOAEL TRV	Source
Dimethyl phthalate	131-11-3	No TRV		No TRV	
n-Dioctyl phthalate	117-84-0	No TRV		7.50E+06	EPA 1999[f]
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)					
2-Chloronaphthalene	91-58-7	No TRV		2.50E+05	US EPA (1989a) in IRIS (2002)[a]
2-Methyl naphthalene	91-57-6	No TRV		No TRV	
5-Nitroacenaphthene	602-87-9	No TRV		No TRV	
Acenaphthene	83-32-9	No TRV		1.75E+04	US EPA (1989b) in IRIS (2002)[a]
Acenaphthylene	208-96-8	No TRV		No TRV	
Anthracene	120-12-7	No TRV		1.00E+05	US EPA (1989c) in IRIS (2002)[a]
Fluorene	86-73-7	No TRV		1.25E+04	US EPA (1989d) in IRIS (2002)[a]
Indene	95-13-6	No TRV		No TRV	
Naphthalene	91-20-3	No TRV		7.10E+03	BCL (1980) in IRIS (2002)[a]
Phenanthrene	85-01-8	No TRV		No TRV	
Pyrene	129-00-0	No TRV		7.50E+03	US EPA (1989e) in IRIS (2002)[a]
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)					
3-Methylcholanthrene	56-49-5	No TRV		No TRV	
5-Methylchrysene	3697-24-3	No TRV		No TRV	
Benzo[a]anthracene	56-55-3	7.90E-01	EPA 1999[f]	1.67E+02	EPA 1999[f]
Benzo[a]pyrene	50-32-8	1.00E+00	EPA 1999[f]	1.00E+02	EPA 1999[f]
Benzo[a,i]pyrene	191-30-0	No TRV		No TRV	
Benzo[b]fluoranthene	205-99-2	1.40E-01	EPA 1999[f]	No TRV	
Benzo[e]pyrene	192-97-2	No TRV		No TRV	
Benzo[g,h,i]perylene	191-24-2	No TRV		No TRV	
Benzo[j]fluoranthene	205-82-3	No TRV		No TRV	
Benzo[k]fluoranthene	207-08-9	1.40E-01	EPA 1999[f]	No TRV	
Chrysene	218-01-9	1.00E+00	EPA 1999[f]	No TRV	
Dibenz[a,h]acridine	226-36-8	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors			
		Aquatic Biota		Chinook Salmon and Other Salmonids	
		NOAEL TRV	Source	NOAEL TRV	Source
Dimethyl phthalate	131-11-3	No TRV		4.00E-04	Chronic LOAEL for rainbow trout (Suter and Tsao 1996[d] Table C-1) × 0.1 for LOAEL-to-NOAEL conversion
n-Dioctyl phthalate	117-84-0	3.20E+02	EPA 1999[f]	3.20E+02	EPA 1999[f]
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)					
2-Chloronaphthalene	91-58-7	No TRV		No TRV	
2-Methyl naphthalene	91-57-6	No TRV		No TRV	
5-Nitroacenaphthene	602-87-9	No TRV		No TRV	
Acenaphthene	83-32-9	2.30E+01	Tier II Chronic (Suter & Tsao 1996)[d]	2.30E+01	NAWQC Chronic (Suter & Tsao 1996)[d]
Acenaphthylene	208-96-8	No TRV		No TRV	
Anthracene	120-12-7	7.30E-01	Tier II Chronic (Suter & Tsao 1996)[d]	7.30E-01	Tier II Chronic (Suter & Tsao 1996)[d]
Fluorene	86-73-7	3.90E+00	Tier II Chronic (Suter & Tsao 1996)[d]	3.90E+00	Tier II Chronic (Suter & Tsao 1996)[d]
Indene	95-13-6	No TRV		No TRV	
Naphthalene	91-20-3	1.20E+01	Tier II Chronic (Suter & Tsao 1996)[d]	1.20E+01	Tier II Chronic (Suter & Tsao 1996)[d]
Phenanthrene	85-01-8	6.30E+00	NAWQC Chronic (Suter & Tsao 1996)[d]	6.30E+00	NAWQC Chronic (Suter & Tsao 1996)[d]
Pyrene	129-00-0	No TRV		No TRV	
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)					
3-Methylcholanthrene	56-49-5	No TRV		No TRV	
5-Methylchrysene	3697-24-3	No TRV		No TRV	
Benzo[a]anthracene	56-55-3	2.70E-02	EPA 1999[f]	2.70E-02	EPA 1999[f]
Benzo[a]pyrene	50-32-8	1.40E-02	EPA 1999[f]	1.40E-02	EPA 1999[f]
Benzo[a,i]pyrene	191-30-0	No TRV		No TRV	
Benzo[b]fluoranthene	205-99-2	2.70E-02	EPA 1999[f]	2.70E-02	EPA 1999[f]
Benzo[e]pyrene	192-97-2	No TRV		No TRV	
Benzo[g,h,i]perylene	191-24-2	No TRV		No TRV	
Benzo[j]fluoranthene	205-82-3	No TRV		No TRV	
Benzo[k]fluoranthene	207-08-9	2.70E-02	EPA 1999[f]	2.70E-02	EPA 1999[f]
Chrysene	218-01-9	2.70E-02	EPA 1999[f]	2.70E-02	EPA 1999[f]
Dibenz[a,h]acridine	226-36-8	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors	
		Benthic Organisms	
		NOAEL TRV	Source
Dimethyl phthalate	131-11-3	No TRV	
n-Dioctyl phthalate	117-84-0	1.16E+10	EPA 1999[f]
Light Polycyclic Aromatic Hydrocarbons (molecular weight <200 g/mole)			
2-Chloronaphthalene	91-58-7	No TRV	
2-Methyl naphthalene	91-57-6	7.00E+01	NOAA (ER-L) Jones and others 1997[i]
5-Nitroacenaphthene	602-87-9	No TRV	
Acenaphthene	83-32-9	4.60E+01	NOAA (ER-L) Jones and others 1997[i]
Acenaphthylene	208-96-8	4.40E+01	NOAA (ER-L) Jones and others 1997[i]
Anthracene	120-12-7	2.20E+02	Persaud and others (1993)[k]
Fluorene	86-73-7	1.90E+02	Persaud and others (1993)[k]
Indene	95-13-6	No TRV	
Naphthalene	91-20-3	1.60E+02	NOAA (ER-L) Jones and others 1997[i]
Phenanthrene	85-01-8	5.60E+02	Persaud and others (1993)[k]
Pyrene	129-00-0	4.90E+02	Persaud and others (1993)[k]
Heavy Polycyclic Aromatic Hydrocarbons (molecular weight >200 g/mole)			
3-Methylcholanthrene	56-49-5	No TRV	
5-Methylchrysene	3697-24-3	No TRV	
Benzo[a]anthracene	56-55-3	1.90E+01	EPA 1999[f]
Benzo[a]pyrene	50-32-8	8.40E+01	EPA 1999[f]
Benzo[a,i]pyrene	191-30-0	No TRV	
Benzo[b]fluoranthene	205-99-2	3.70E+01	EPA 1999[f]
Benzo[e]pyrene	192-97-2	No TRV	
Benzo[g,h,i]perylene	191-24-2	1.70E+02	Persaud and others (1993)[k]
Benzo[j]fluoranthene	205-82-3	No TRV	
Benzo[k]fluoranthene	207-08-9	3.70E+01	EPA 1999[f]
Chrysene	218-01-9	3.00E+01	EPA 1999[f]
Dibenz[a,h]acridine	226-36-8	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Exposure, Terrestrial Receptors			
		Plant		Terrestrial Invertebrate	
		TRV	Source	TRV	Source
Dibenz[a,h]anthracene	53-70-3	1.20E+03	EPA 1999[f]	2.50E+04	EPA 1999[f]
Dibenz[a,j]acridine	224-42-0	No TRV		No TRV	
Dibenzo[a,e]fluoranthene	5385-75-1	No TRV		No TRV	
Dibenzo[a,e]pyrene	192-65-4	No TRV		No TRV	
Dibenzo[a,h]fluoranthene	No CAS #	No TRV		No TRV	
Dibenzo[a,h]pyrene	189-64-0	No TRV		No TRV	
Dibenzo[a,i]pyrene	189-55-9	No TRV		No TRV	
Fluoranthene	206-44-0	No TRV		No TRV	
Hexachloronaphthalene	1335-87-1	No TRV		No TRV	
Indeno[1,2,3-cd]pyrene	193-39-5	1.20E+03	EPA 1999[f]	2.50E+04	EPA 1999[f]
Octachloronaphthalene	2234-13-1	No TRV		No TRV	
Pentachloronaphthalene	1321-64-8	No TRV		No TRV	
Tetrachloronaphthalene	1335-88-2	No TRV		No TRV	
Trichloronaphthalene	1321-65-9	No TRV		No TRV	
Light Substituted Benzene Compounds (molecular weight <200 g/mole)					
1,2,3-Trichlorobenzene	87-61-6	No TRV		2.00E+04	Efroymson and others (1997b)[h]
1,2,4-Trichlorobenzene	120-82-1	No TRV		2.00E+04	Efroymson and others (1997b)[h]
1,2,4-Trimethyl benzene	95-63-6	No TRV		No TRV	
1,2-Dichlorobenzene	95-50-1	No TRV		No TRV	
1,3,5-Trimethyl benzene	108-67-8	No TRV		No TRV	
1,3-Dichlorobenzene	541-73-1	No TRV		No TRV	
1,3-Dinitrobenzene	99-65-0	No TRV		2.26E+03	EPA 1999[f]
1,4-Dichlorobenzene	106-46-7	No TRV		2.00E+04	Efroymson and others (1997b)[h]
1,4-Dinitrobenzene	100-25-4	No TRV		No TRV	
2,4,5-Trichlorophenol	95-95-4	4.00E+03	Efroymson and others (1997a)[e]	9.00E+03	Efroymson and others (1997b)[h]
2,4,6-Trichlorophenol	88-06-2	No TRV		1.00E+04	Efroymson and others (1997b)[h]
2,4-Dichlorophenol	120-83-2	No TRV		No TRV	
2,4-Dimethylphenol	105-67-9	No TRV		No TRV	
2,4-Dinitrophenol	51-28-5	2.00E+04	Efroymson and others (1997a)[e]	No TRV	
2,4-Dinitrotoluene	121-14-2	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Mule Deer		Mourning Dove	
		NOAEL TRV	Source	NOAEL TRV	Source
Dibenz[a,h]anthracene	53-70-3	2.00E+00	EPA 1999[f]	3.90E-01	EPA 1999[f]
Dibenz[a,j]acridine	224-42-0	No TRV		No TRV	
Dibenzo[a,e]fluoranthene	5385-75-1	No TRV		No TRV	
Dibenzo[a,e]pyrene	192-65-4	No TRV		No TRV	
Dibenzo[a,h]fluoranthene	No CAS #	No TRV		No TRV	
Dibenzo[a,h]pyrene	189-64-0	No TRV		No TRV	
Dibenzo[a,i]pyrene	189-55-9	No TRV		No TRV	
Fluoranthene	206-44-0	1.25E+04	US EPA (1988) in IRIS (2002)[a]	No TRV	
Hexachloronaphthalene	1335-87-1	No TRV		No TRV	
Indeno[1,2,3-cd]pyrene	193-39-5	No TRV		1.00E+00	EPA 1999[f]
Octachloronaphthalene	2234-13-1	No TRV		No TRV	
Pentachloronaphthalene	1321-64-8	No TRV		No TRV	
Tetrachloronaphthalene	1335-88-2	No TRV		No TRV	
Trichloronaphthalene	1321-65-9	No TRV		No TRV	
Light Substituted Benzene Compounds (molecular weight <200 g/mole)					
1,2,3-Trichlorobenzene	87-61-6	No TRV		No TRV	
1,2,4-Trichlorobenzene	120-82-1	No TRV		No TRV	
1,2,4-Trimethyl benzene	95-63-6	No TRV		No TRV	
1,2-Dichlorobenzene	95-50-1	8.57E+04	NTP (1985b) in IRIS (2002)[a]	No TRV	
1,3,5-Trimethyl benzene	108-67-8	No TRV		No TRV	
1,3-Dichlorobenzene	541-73-1	No TRV		No TRV	
1,3-Dinitrobenzene	99-65-0	1.05E+03	EPA 1999[f]	4.22E-01	EPA 1999[f]
1,4-Dichlorobenzene	106-46-7	No TRV		No TRV	
1,4-Dinitrobenzene	100-25-4	No TRV		No TRV	
2,4,5-Trichlorophenol	95-95-4	1.00E+04	McCollister and others (1961) in IRIS (2002)[a]	No TRV	
2,4,6-Trichlorophenol	88-06-2	No TRV		No TRV	
2,4-Dichlorophenol	120-83-2	3.00E+01	Exon and Koller (1985) in IRIS (2002)[a]	No TRV	
2,4-Dimethylphenol	105-67-9	5.00E+03	US EPA (1989f) in IRIS (2002)[a]	No TRV	
2,4-Dinitrophenol	51-28-5	2.00E+02	Horner (1942) in IRIS (2002)[a]	No TRV	
2,4-Dinitrotoluene	121-14-2	3.50E+04	EPA 1999[f]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Great Basin Pocket Mouse		Western Meadowlark	
		NOAEL TRV	Source	NOAEL TRV	Source
Dibenz[a,h]anthracene	53-70-3	2.00E+00	EPA 1999[f]	3.90E-01	EPA 1999[f]
Dibenz[a,j]acridine	224-42-0	No TRV		No TRV	
Dibenzo[a,e]fluoranthene	5385-75-1	No TRV		No TRV	
Dibenzo[a,e]pyrene	192-65-4	No TRV		No TRV	
Dibenzo[a,h]fluoranthene	No CAS #	No TRV		No TRV	
Dibenzo[a,h]pyrene	189-64-0	No TRV		No TRV	
Dibenzo[a,i]pyrene	189-55-9	No TRV		No TRV	
Fluoranthene	206-44-0	1.25E+04	US EPA (1988) in IRIS (2002)[a]	No TRV	
Hexachloronaphthalene	1335-87-1	No TRV		No TRV	
Indeno[1,2,3-cd]pyrene	193-39-5	No TRV		1.00E+00	EPA 1999[f]
Octachloronaphthalene	2234-13-1	No TRV		No TRV	
Pentachloronaphthalene	1321-64-8	No TRV		No TRV	
Tetrachloronaphthalene	1335-88-2	No TRV		No TRV	
Trichloronaphthalene	1321-65-9	No TRV		No TRV	
Light Substituted Benzene Compounds (molecular weight <200 g/mole)					
1,2,3-Trichlorobenzene	87-61-6	No TRV		No TRV	
1,2,4-Trichlorobenzene	120-82-1	No TRV		No TRV	
1,2,4-Trimethyl benzene	95-63-6	No TRV		No TRV	
1,2-Dichlorobenzene	95-50-1	8.57E+04	NTP (1985b) in IRIS (2002)[a]	No TRV	
1,3,5-Trimethyl benzene	108-67-8	No TRV		No TRV	
1,3-Dichlorobenzene	541-73-1	No TRV		No TRV	
1,3-Dinitrobenzene	99-65-0	1.05E+03	EPA 1999[f]	4.22E-01	EPA 1999[f]
1,4-Dichlorobenzene	106-46-7	No TRV		No TRV	
1,4-Dinitrobenzene	100-25-4	No TRV		No TRV	
2,4,5-Trichlorophenol	95-95-4	1.00E+04	McCollister and others (1961) in IRIS (2002)[a]	No TRV	
2,4,6-Trichlorophenol	88-06-2	No TRV		No TRV	
2,4-Dichlorophenol	120-83-2	3.00E+01	Exon and Koller (1985) in IRIS (2002)[a]	No TRV	
2,4-Dimethylphenol	105-67-9	5.00E+03	US EPA (1989f) in IRIS (2002)[a]	No TRV	
2,4-Dinitrophenol	51-28-5	2.00E+02	Horner (1942) in IRIS (2002)[a]	No TRV	
2,4-Dinitrotoluene	121-14-2	3.50E+04	EPA 1999[f]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Coyote		Burrowing Owl	
		NOAEL TRV	Source	NOAEL TRV	Source
Dibenz[a,h]anthracene	53-70-3	2.00E+00	EPA 1999[f]	3.90E-01	EPA 1999[f]
Dibenz[a,j]acridine	224-42-0	No TRV		No TRV	
Dibenzo[a,e]fluoranthene	5385-75-1	No TRV		No TRV	
Dibenzo[a,e]pyrene	192-65-4	No TRV		No TRV	
Dibenzo[a,h]fluoranthene	No CAS #	No TRV		No TRV	
Dibenzo[a,h]pyrene	189-64-0	No TRV		No TRV	
Dibenzo[a,i]pyrene	189-55-9	No TRV		No TRV	
Fluoranthene	206-44-0	1.25E+04	US EPA (1988) in IRIS (2002)[a]	No TRV	
Hexachloronaphthalene	1335-87-1	No TRV		No TRV	
Indeno[1,2,3-cd]pyrene	193-39-5	No TRV		1.00E+00	EPA 1999[f]
Octachloronaphthalene	2234-13-1	No TRV		No TRV	
Pentachloronaphthalene	1321-64-8	No TRV		No TRV	
Tetrachloronaphthalene	1335-88-2	No TRV		No TRV	
Trichloronaphthalene	1321-65-9	No TRV		No TRV	
Light Substituted Benzene Compounds (molecular weight <200 g/mole)					
1,2,3-Trichlorobenzene	87-61-6	No TRV		No TRV	
1,2,4-Trichlorobenzene	120-82-1	No TRV		No TRV	
1,2,4-Trimethyl benzene	95-63-6	No TRV		No TRV	
1,2-Dichlorobenzene	95-50-1	8.57E+04	NTP (1985b) in IRIS (2002)[a]	No TRV	
1,3,5-Trimethyl benzene	108-67-8	No TRV		No TRV	
1,3-Dichlorobenzene	541-73-1	No TRV		No TRV	
1,3-Dinitrobenzene	99-65-0	1.05E+03	EPA 1999[f]	4.22E-01	EPA 1999[f]
1,4-Dichlorobenzene	106-46-7	No TRV		No TRV	
1,4-Dinitrobenzene	100-25-4	No TRV		No TRV	
2,4,5-Trichlorophenol	95-95-4	1.00E+04	McCollister and others (1961) in IRIS (2002)[a]	No TRV	
2,4,6-Trichlorophenol	88-06-2	No TRV		No TRV	
2,4-Dichlorophenol	120-83-2	3.00E+01	Exon and Koller (1985) in IRIS (2002)[a]	No TRV	
2,4-Dimethylphenol	105-67-9	5.00E+03	US EPA (1989f) in IRIS (2002)[a]	No TRV	
2,4-Dinitrophenol	51-28-5	2.00E+02	Horner (1942) in IRIS (2002)[a]	No TRV	
2,4-Dinitrotoluene	121-14-2	3.50E+04	EPA 1999[f]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures		Ingestion, Aquatic Exposures	
		Red-tailed Hawk		Canada Goose	
		NOAEL TRV	Source	NOAEL TRV	Source
Dibenz[a,h]anthracene	53-70-3	3.90E-01	EPA 1999[f]	3.90E-01	EPA 1999[f]
Dibenz[a,j]acridine	224-42-0	No TRV		No TRV	
Dibenzo[a,e]fluoranthene	5385-75-1	No TRV		No TRV	
Dibenzo[a,e]pyrene	192-65-4	No TRV		No TRV	
Dibenzo[a,h]fluoranthene	No CAS #	No TRV		No TRV	
Dibenzo[a,h]pyrene	189-64-0	No TRV		No TRV	
Dibenzo[a,i]pyrene	189-55-9	No TRV		No TRV	
Fluoranthene	206-44-0	No TRV		No TRV	
Hexachloronaphthalene	1335-87-1	No TRV		No TRV	
Indeno[1,2,3-cd]pyrene	193-39-5	1.00E+00	EPA 1999[f]	1.00E+00	EPA 1999[f]
Octachloronaphthalene	2234-13-1	No TRV		No TRV	
Pentachloronaphthalene	1321-64-8	No TRV		No TRV	
Tetrachloronaphthalene	1335-88-2	No TRV		No TRV	
Trichloronaphthalene	1321-65-9	No TRV		No TRV	
Light Substituted Benzene Compounds (molecular weight <200 g/mole)					
1,2,3-Trichlorobenzene	87-61-6	No TRV		No TRV	
1,2,4-Trichlorobenzene	120-82-1	No TRV		No TRV	
1,2,4-Trimethyl benzene	95-63-6	No TRV		No TRV	
1,2-Dichlorobenzene	95-50-1	No TRV		No TRV	
1,3,5-Trimethyl benzene	108-67-8	No TRV		No TRV	
1,3-Dichlorobenzene	541-73-1	No TRV		No TRV	
1,3-Dinitrobenzene	99-65-0	4.22E-01	EPA 1999[f]	4.22E-01	EPA 1999[f]
1,4-Dichlorobenzene	106-46-7	No TRV		No TRV	
1,4-Dinitrobenzene	100-25-4	No TRV		No TRV	
2,4,5-Trichlorophenol	95-95-4	No TRV		No TRV	
2,4,6-Trichlorophenol	88-06-2	No TRV		No TRV	
2,4-Dichlorophenol	120-83-2	No TRV		No TRV	
2,4-Dimethylphenol	105-67-9	No TRV		No TRV	
2,4-Dinitrophenol	51-28-5	No TRV		No TRV	
2,4-Dinitrotoluene	121-14-2	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Spotted Sandpiper		Great Blue Heron	
		NOAEL TRV	Source	NOAEL TRV	Source
Dibenz[a,h]anthracene	53-70-3	3.90E-01	EPA 1999[f]	3.90E-01	EPA 1999[f]
Dibenz[a,j]acridine	224-42-0	No TRV		No TRV	
Dibenzo[a,e]fluoranthene	5385-75-1	No TRV		No TRV	
Dibenzo[a,e]pyrene	192-65-4	No TRV		No TRV	
Dibenzo[a,h]fluoranthene	No CAS #	No TRV		No TRV	
Dibenzo[a,h]pyrene	189-64-0	No TRV		No TRV	
Dibenzo[a,i]pyrene	189-55-9	No TRV		No TRV	
Fluoranthene	206-44-0	No TRV		No TRV	
Hexachloronaphthalene	1335-87-1	No TRV		No TRV	
Indeno[1,2,3-cd]pyrene	193-39-5	1.00E+00	EPA 1999[f]	1.00E+00	EPA 1999[f]
Octachloronaphthalene	2234-13-1	No TRV		No TRV	
Pentachloronaphthalene	1321-64-8	No TRV		No TRV	
Tetrachloronaphthalene	1335-88-2	No TRV		No TRV	
Trichloronaphthalene	1321-65-9	No TRV		No TRV	
Light Substituted Benzene Compounds (molecular weight <200 g/mole)					
1,2,3-Trichlorobenzene	87-61-6	No TRV		No TRV	
1,2,4-Trichlorobenzene	120-82-1	No TRV		No TRV	
1,2,4-Trimethyl benzene	95-63-6	No TRV		No TRV	
1,2-Dichlorobenzene	95-50-1	No TRV		No TRV	
1,3,5-Trimethyl benzene	108-67-8	No TRV		No TRV	
1,3-Dichlorobenzene	541-73-1	No TRV		No TRV	
1,3-Dinitrobenzene	99-65-0	4.22E-01	EPA 1999[f]	4.22E-01	EPA 1999[f]
1,4-Dichlorobenzene	106-46-7	No TRV		No TRV	
1,4-Dinitrobenzene	100-25-4	No TRV		No TRV	
2,4,5-Trichlorophenol	95-95-4	No TRV		No TRV	
2,4,6-Trichlorophenol	88-06-2	No TRV		No TRV	
2,4-Dichlorophenol	120-83-2	No TRV		No TRV	
2,4-Dimethylphenol	105-67-9	No TRV		No TRV	
2,4-Dinitrophenol	51-28-5	No TRV		No TRV	
2,4-Dinitrotoluene	121-14-2	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Bald Eagle		Mink	
		NOAEL TRV	Source	NOAEL TRV	Source
Dibenz[a,h]anthracene	53-70-3	3.90E-01	EPA 1999[f]	2.00E+00	EPA 1999[f]
Dibenz[a,j]acridine	224-42-0	No TRV		No TRV	
Dibenzo[a,e]fluoranthene	5385-75-1	No TRV		No TRV	
Dibenzo[a,e]pyrene	192-65-4	No TRV		No TRV	
Dibenzo[a,h]fluoranthene	No CAS #	No TRV		No TRV	
Dibenzo[a,h]pyrene	189-64-0	No TRV		No TRV	
Dibenzo[a,i]pyrene	189-55-9	No TRV		No TRV	
Fluoranthene	206-44-0	No TRV		1.25E+04	US EPA (1988) in IRIS (2002)[a]
Hexachloronaphthalene	1335-87-1	No TRV		No TRV	
Indeno[1,2,3-cd]pyrene	193-39-5	1.00E+00	EPA 1999[f]	No TRV	
Octachloronaphthalene	2234-13-1	No TRV		No TRV	
Pentachloronaphthalene	1321-64-8	No TRV		No TRV	
Tetrachloronaphthalene	1335-88-2	No TRV		No TRV	
Trichloronaphthalene	1321-65-9	No TRV		No TRV	
Light Substituted Benzene Compounds (molecular weight <200 g/mole)					
1,2,3-Trichlorobenzene	87-61-6	No TRV		No TRV	
1,2,4-Trichlorobenzene	120-82-1	No TRV		No TRV	
1,2,4-Trimethyl benzene	95-63-6	No TRV		No TRV	
1,2-Dichlorobenzene	95-50-1	No TRV		8.57E+04	NTP (1985b) in IRIS (2002)[a]
1,3,5-Trimethyl benzene	108-67-8	No TRV		No TRV	
1,3-Dichlorobenzene	541-73-1	No TRV		No TRV	
1,3-Dinitrobenzene	99-65-0	4.22E-01	EPA 1999[f]	1.05E+03	EPA 1999[f]
1,4-Dichlorobenzene	106-46-7	No TRV		No TRV	
1,4-Dinitrobenzene	100-25-4	No TRV		No TRV	
2,4,5-Trichlorophenol	95-95-4	No TRV		1.00E+04	McCollister and others (1961) in IRIS (2002)[a]
2,4,6-Trichlorophenol	88-06-2	No TRV		No TRV	
2,4-Dichlorophenol	120-83-2	No TRV		3.00E+01	Exon and Koller (1985) in IRIS (2002)[a]
2,4-Dimethylphenol	105-67-9	No TRV		5.00E+03	US EPA (1989f) in IRIS (2002)[a]
2,4-Dinitrophenol	51-28-5	No TRV		2.00E+02	Horner (1942) in IRIS (2002)[a]
2,4-Dinitrotoluene	121-14-2	No TRV		3.50E+04	EPA 1999[f]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors			
		Aquatic Biota		Chinook Salmon and Other Salmonids	
		NOAEL TRV	Source	NOAEL TRV	Source
Dibenz[a,h]anthracene	53-70-3	2.70E-02	EPA 1999[f]	2.70E-02	EPA 1999[f]
Dibenz[a,j]acridine	224-42-0	No TRV		No TRV	
Dibenzo[a,e]fluoranthene	5385-75-1	No TRV		No TRV	
Dibenzo[a,e]pyrene	192-65-4	No TRV		No TRV	
Dibenzo[a,h]fluoranthene	No CAS #	No TRV		No TRV	
Dibenzo[a,h]pyrene	189-64-0	No TRV		No TRV	
Dibenzo[a,i]pyrene	189-55-9	No TRV		No TRV	
Fluoranthene	206-44-0	6.16E+00	NAWQC Chronic (Suter & Tsao 1996)[d]	6.16E+00	NAWQC Chronic (Suter & Tsao 1996)[d]
Hexachloronaphthalene	1335-87-1	No TRV		No TRV	
Indeno[1,2,3-cd]pyrene	193-39-5	2.70E-02	EPA 1999[f]	2.70E-02	EPA 1999[f]
Octachloronaphthalene	2234-13-1	No TRV		No TRV	
Pentachloronaphthalene	1321-64-8	No TRV		No TRV	
Tetrachloronaphthalene	1335-88-2	No TRV		No TRV	
Trichloronaphthalene	1321-65-9	No TRV		No TRV	
Light Substituted Benzene Compounds (molecular weight <200 g/mole)					
1,2,3-Trichlorobenzene	87-61-6	No TRV		No TRV	
1,2,4-Trichlorobenzene	120-82-1	1.10E+02	Tier II Chronic (Suter & Tsao 1996)[d]	1.10E+02	Tier II Chronic (Suter & Tsao 1996)[d]
1,2,4-Trimethyl benzene	95-63-6	No TRV		No TRV	
1,2-Dichlorobenzene	95-50-1	1.40E+01	Tier II Chronic (Suter & Tsao 1996)[d]	1.40E+01	Tier II Chronic (Suter & Tsao 1996)[d]
1,3,5-Trimethyl benzene	108-67-8	No TRV		No TRV	
1,3-Dichlorobenzene	541-73-1	7.10E+01	Tier II Chronic (Suter & Tsao 1996)[d]	7.10E+01	Tier II Chronic (Suter & Tsao 1996)[d]
1,3-Dinitrobenzene	99-65-0	2.60E+01	EPA 1999[f]	2.60E+01	EPA 1999[f]
1,4-Dichlorobenzene	106-46-7	1.50E+01	Tier II Chronic (Suter & Tsao 1996)[d]	1.50E+01	Tier II Chronic (Suter & Tsao 1996)[d]
1,4-Dinitrobenzene	100-25-4	No TRV		No TRV	
2,4,5-Trichlorophenol	95-95-4	No TRV		No TRV	
2,4,6-Trichlorophenol	88-06-2	9.70E+00	EPA 1987[b]	9.70E+00	EPA 1987[b]
2,4-Dichlorophenol	120-83-2	3.65E+01	EPA 1987[b]	3.65E+01	EPA 1987[b]
2,4-Dimethylphenol	105-67-9	2.12E+01	EPA 1987[b]	2.12E+01	EPA 1987[b]
2,4-Dinitrophenol	51-28-5	No TRV		No TRV	
2,4-Dinitrotoluene	121-14-2	2.30E+01	EPA 1999[f]	2.30E+01	EPA 1999[f]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors	
		Benthic Organisms	
		NOAEL TRV	Source
Dibenz[a,h]anthracene	53-70-3	1.00E+01	EPA 1999[f]
Dibenz[a,j]acridine	224-42-0	No TRV	
Dibenzo[a,e]fluoranthene	5385-75-1	No TRV	
Dibenzo[a,e]pyrene	192-65-4	No TRV	
Dibenzo[a,h]fluoranthene	No CAS #	No TRV	
Dibenzo[a,h]pyrene	189-64-0	No TRV	
Dibenzo[a,i]pyrene	189-55-9	No TRV	
Fluoranthene	206-44-0	7.50E+02	Persaud and others (1993)[k]
Hexachloronaphthalene	1335-87-1	No TRV	
Indeno[1,2,3-cd]pyrene	193-39-5	3.00E+01	EPA 1999[f]
Octachloronaphthalene	2234-13-1	No TRV	
Pentachloronaphthalene	1321-64-8	No TRV	
Tetrachloronaphthalene	1335-88-2	No TRV	
Trichloronaphthalene	1321-65-9	No TRV	
Light Substituted Benzene Compounds (molecular weight <200 g/mole)			
1,2,3-Trichlorobenzene	87-61-6	No TRV	
1,2,4-Trichlorobenzene	120-82-1	7.30E+03	EqP method (Jones and others 1997)[i]
1,2,4-Trimethyl benzene	95-63-6	No TRV	
1,2-Dichlorobenzene	95-50-1	2.12E+02	EqP method (Jones and others 1997)[i]
1,3,5-Trimethyl benzene	108-67-8	No TRV	
1,3-Dichlorobenzene	541-73-1	2.28E+03	EqP method (Jones and others 1997)[i]
1,3-Dinitrobenzene	99-65-0	2.14E+01	EPA 1999[f]
1,4-Dichlorobenzene	106-46-7	3.70E+02	EqP method (Jones and others 1997)[i]
1,4-Dinitrobenzene	100-25-4	No TRV	
2,4,5-Trichlorophenol	95-95-4	No TRV	
2,4,6-Trichlorophenol	88-06-2	No TRV	
2,4-Dichlorophenol	120-83-2	No TRV	
2,4-Dimethylphenol	105-67-9	No TRV	
2,4-Dinitrophenol	51-28-5	No TRV	
2,4-Dinitrotoluene	121-14-2	4.69E+01	EPA 1999[f]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Exposure, Terrestrial Receptors			
		Plant		Terrestrial Invertebrate	
		TRV	Source	TRV	Source
2,6-Dinitrotoluene	606-20-2	No TRV		No TRV	
2-Chlorophenol	95-57-8	No TRV		No TRV	
2-Chlorotoluene	95-49-8	No TRV		No TRV	
2-Nitrophenol	88-75-5	No TRV		No TRV	
4,6-Dinitro-o-cresol	534-52-1	No TRV		No TRV	
4-Chlorotoluene	106-43-4	No TRV		No TRV	
4-Nitrophenol	100-02-7	No TRV		7.00E+03	Efroymson and others (1997b)[h]
alpha-Methylstyrene	98-83-9	No TRV		No TRV	
Aniline	62-53-3	No TRV		No TRV	
Benzotrichloride	98-07-7	No TRV		No TRV	
Benzyl chloride	100-44-7	No TRV		No TRV	
Bromobenzene	108-86-1	No TRV		No TRV	
Chlorobenzene	108-90-7	No TRV		4.00E+04	Efroymson and others (1997b)[h]
Cumene	98-82-8	No TRV		No TRV	
m-Cresol	108-39-4	No TRV		No TRV	
n-Butyl benzene	104-51-8	No TRV		No TRV	
Nitrobenzene	98-95-3	No TRV		2.26E+03	EPA 1999[f]
n-Propyl benzene	103-65-1	No TRV		No TRV	
o-Cresol	95-48-7	No TRV		No TRV	
o-Dinitrobenzene	528-29-0	No TRV		No TRV	
o-Nitroaniline	88-74-4	No TRV		No TRV	
o-Toluidine	95-53-4	No TRV		No TRV	
p-Chloroaniline	106-47-8	No TRV		3.00E+04	Efroymson and others (1997b)[h]
p-Cresol	106-44-5	No TRV		No TRV	
Phenol	108-95-2	7.00E+04	Efroymson and others (1997a)[e]	3.00E+04	Efroymson and others (1997b)[h]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Mule Deer		Mourning Dove	
		NOAEL TRV	Source	NOAEL TRV	Source
2,6-Dinitrotoluene	606-20-2	4.00E+01	EPA 1999[f]	No TRV	
2-Chlorophenol	95-57-8	No TRV		No TRV	
2-Chlorotoluene	95-49-8	2.00E+04	Gibson and others (1974) in IRIS (2002)[a]	No TRV	
2-Nitrophenol	88-75-5	No TRV		No TRV	
4,6-Dinitro-o-cresol	534-52-1	No TRV		No TRV	
4-Chlorotoluene	106-43-4	No TRV		No TRV	
4-Nitrophenol	100-02-7	No TRV		No TRV	
alpha-Methylstyrene	98-83-9	No TRV		No TRV	
Aniline	62-53-3	No TRV		No TRV	
Benzotrichloride	98-07-7	No TRV		No TRV	
Benzyl chloride	100-44-7	No TRV		No TRV	
Bromobenzene	108-86-1	No TRV		No TRV	
Chlorobenzene	108-90-7	1.90E+04	Monsanto Co. (1967), Knapp and others (1971) in IRIS (2002)[a]	No TRV	
Cumene	98-82-8	1.10E+05	Wolf and others (1956) in IRIS (2002)[a]	No TRV	
m-Cresol	108-39-4	5.00E+03	US EPA (1986g, 1987b) in IRIS (2002)[a]	No TRV	
n-Butyl benzene	104-51-8	No TRV		No TRV	
Nitrobenzene	98-95-3	4.60E+01	CIIT (1984) in IRIS (2002)[a]	No TRV	
n-Propyl benzene	103-65-1	No TRV		No TRV	
o-Cresol	95-48-7	5.00E+03	US EPA (1986g, 1987b) in IRIS (2002)[a]	No TRV	
o-Dinitrobenzene	528-29-0	No TRV		No TRV	
o-Nitroaniline	88-74-4	No TRV		No TRV	
o-Toluidine	95-53-4	No TRV		No TRV	
p-Chloroaniline	106-47-8	1.25E+03	NCI (1979a) in IRIS (2002)[a]	No TRV	
p-Cresol	106-44-5	No TRV		No TRV	
Phenol	108-95-2	6.00E+04	NTP (1983c) in IRIS (2002)[a]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Great Basin Pocket Mouse		Western Meadowlark	
		NOAEL TRV	Source	NOAEL TRV	Source
2,6-Dinitrotoluene	606-20-2	4.00E+01	EPA 1999[f]	No TRV	
2-Chlorophenol	95-57-8	No TRV		No TRV	
2-Chlorotoluene	95-49-8	2.00E+04	Gibson and others (1974) in IRIS (2002)[a]	No TRV	
2-Nitrophenol	88-75-5	No TRV		No TRV	
4,6-Dinitro-o-cresol	534-52-1	No TRV		No TRV	
4-Chlorotoluene	106-43-4	No TRV		No TRV	
4-Nitrophenol	100-02-7	No TRV		No TRV	
alpha-Methylstyrene	98-83-9	No TRV		No TRV	
Aniline	62-53-3	No TRV		No TRV	
Benzotrichloride	98-07-7	No TRV		No TRV	
Benzyl chloride	100-44-7	No TRV		No TRV	
Bromobenzene	108-86-1	No TRV		No TRV	
Chlorobenzene	108-90-7	1.90E+04	Monsanto Co. (1967), Knapp and others (1971) in IRIS (2002)[a]	No TRV	
Cumene	98-82-8	1.10E+05	Wolf and others (1956) in IRIS (2002)[a]	No TRV	
m-Cresol	108-39-4	5.00E+03	US EPA (1986g, 1987b) in IRIS (2002)[a]	No TRV	
n-Butyl benzene	104-51-8	No TRV		No TRV	
Nitrobenzene	98-95-3	4.60E+01	CIIT (1984) in IRIS (2002)[a]	No TRV	
n-Propyl benzene	103-65-1	No TRV		No TRV	
o-Cresol	95-48-7	5.00E+03	US EPA (1986g, 1987b) in IRIS (2002)[a]	No TRV	
o-Dinitrobenzene	528-29-0	No TRV		No TRV	
o-Nitroaniline	88-74-4	No TRV		No TRV	
o-Toluidine	95-53-4	No TRV		No TRV	
p-Chloroaniline	106-47-8	1.25E+03	NCI (1979a) in IRIS (2002)[a]	No TRV	
p-Cresol	106-44-5	No TRV		No TRV	
Phenol	108-95-2	6.00E+04	NTP (1983c) in IRIS (2002)[a]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Coyote		Burrowing Owl	
		NOAEL TRV	Source	NOAEL TRV	Source
2,6-Dinitrotoluene	606-20-2	4.00E+01	EPA 1999[f]	No TRV	
2-Chlorophenol	95-57-8	No TRV		No TRV	
2-Chlorotoluene	95-49-8	2.00E+04	Gibson and others (1974) in IRIS (2002)[a]	No TRV	
2-Nitrophenol	88-75-5	No TRV		No TRV	
4,6-Dinitro-o-cresol	534-52-1	No TRV		No TRV	
4-Chlorotoluene	106-43-4	No TRV		No TRV	
4-Nitrophenol	100-02-7	No TRV		No TRV	
alpha-Methylstyrene	98-83-9	No TRV		No TRV	
Aniline	62-53-3	No TRV		No TRV	
Benzotrichloride	98-07-7	No TRV		No TRV	
Benzyl chloride	100-44-7	No TRV		No TRV	
Bromobenzene	108-86-1	No TRV		No TRV	
Chlorobenzene	108-90-7	1.90E+04	Monsanto Co. (1967), Knapp and others (1971) in IRIS (2002)[a]	No TRV	
Cumene	98-82-8	1.10E+05	Wolf and others (1956) in IRIS (2002)[a]	No TRV	
m-Cresol	108-39-4	5.00E+03	US EPA (1986g, 1987b) in IRIS (2002)[a]	No TRV	
n-Butyl benzene	104-51-8	No TRV		No TRV	
Nitrobenzene	98-95-3	4.60E+01	CIIT (1984) in IRIS (2002)[a]	No TRV	
n-Propyl benzene	103-65-1	No TRV		No TRV	
o-Cresol	95-48-7	5.00E+03	US EPA (1986g, 1987b) in IRIS (2002)[a]	No TRV	
o-Dinitrobenzene	528-29-0	No TRV		No TRV	
o-Nitroaniline	88-74-4	No TRV		No TRV	
o-Toluidine	95-53-4	No TRV		No TRV	
p-Chloroaniline	106-47-8	1.25E+03	NCI (1979a) in IRIS (2002)[a]	No TRV	
p-Cresol	106-44-5	No TRV		No TRV	
Phenol	108-95-2	6.00E+04	NTP (1983c) in IRIS (2002)[a]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures		Ingestion, Aquatic Exposures	
		Red-tailed Hawk		Canada Goose	
		NOAEL TRV	Source	NOAEL TRV	Source
2,6-Dinitrotoluene	606-20-2	No TRV		No TRV	
2-Chlorophenol	95-57-8	No TRV		No TRV	
2-Chlorotoluene	95-49-8	No TRV		No TRV	
2-Nitrophenol	88-75-5	No TRV		No TRV	
4,6-Dinitro-o-cresol	534-52-1	No TRV		No TRV	
4-Chlorotoluene	106-43-4	No TRV		No TRV	
4-Nitrophenol	100-02-7	No TRV		No TRV	
alpha-Methylstyrene	98-83-9	No TRV		No TRV	
Aniline	62-53-3	No TRV		No TRV	
Benzotrichloride	98-07-7	No TRV		No TRV	
Benzyl chloride	100-44-7	No TRV		No TRV	
Bromobenzene	108-86-1	No TRV		No TRV	
Chlorobenzene	108-90-7	No TRV		No TRV	
Cumene	98-82-8	No TRV		No TRV	
m-Cresol	108-39-4	No TRV		No TRV	
n-Butyl benzene	104-51-8	No TRV		No TRV	
Nitrobenzene	98-95-3	No TRV		No TRV	
n-Propyl benzene	103-65-1	No TRV		No TRV	
o-Cresol	95-48-7	No TRV		No TRV	
o-Dinitrobenzene	528-29-0	No TRV		No TRV	
o-Nitroaniline	88-74-4	No TRV		No TRV	
o-Toluidine	95-53-4	No TRV		No TRV	
p-Chloroaniline	106-47-8	No TRV		No TRV	
p-Cresol	106-44-5	No TRV		No TRV	
Phenol	108-95-2	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Spotted Sandpiper		Great Blue Heron	
		NOAEL TRV	Source	NOAEL TRV	Source
2,6-Dinitrotoluene	606-20-2	No TRV		No TRV	
2-Chlorophenol	95-57-8	No TRV		No TRV	
2-Chlorotoluene	95-49-8	No TRV		No TRV	
2-Nitrophenol	88-75-5	No TRV		No TRV	
4,6-Dinitro-o-cresol	534-52-1	No TRV		No TRV	
4-Chlorotoluene	106-43-4	No TRV		No TRV	
4-Nitrophenol	100-02-7	No TRV		No TRV	
alpha-Methylstyrene	98-83-9	No TRV		No TRV	
Aniline	62-53-3	No TRV		No TRV	
Benzotrichloride	98-07-7	No TRV		No TRV	
Benzyl chloride	100-44-7	No TRV		No TRV	
Bromobenzene	108-86-1	No TRV		No TRV	
Chlorobenzene	108-90-7	No TRV		No TRV	
Cumene	98-82-8	No TRV		No TRV	
m-Cresol	108-39-4	No TRV		No TRV	
n-Butyl benzene	104-51-8	No TRV		No TRV	
Nitrobenzene	98-95-3	No TRV		No TRV	
n-Propyl benzene	103-65-1	No TRV		No TRV	
o-Cresol	95-48-7	No TRV		No TRV	
o-Dinitrobenzene	528-29-0	No TRV		No TRV	
o-Nitroaniline	88-74-4	No TRV		No TRV	
o-Toluidine	95-53-4	No TRV		No TRV	
p-Chloroaniline	106-47-8	No TRV		No TRV	
p-Cresol	106-44-5	No TRV		No TRV	
Phenol	108-95-2	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Bald Eagle		Mink	
		NOAEL TRV	Source	NOAEL TRV	Source
2,6-Dinitrotoluene	606-20-2	No TRV		4.00E+01	EPA 1999[f]
2-Chlorophenol	95-57-8	No TRV		No TRV	
2-Chlorotoluene	95-49-8	No TRV		2.00E+04	Gibson and others (1974) in IRIS (2002)[a]
2-Nitrophenol	88-75-5	No TRV		No TRV	
4,6-Dinitro-o-cresol	534-52-1	No TRV		No TRV	
4-Chlorotoluene	106-43-4	No TRV		No TRV	
4-Nitrophenol	100-02-7	No TRV		No TRV	
alpha-Methylstyrene	98-83-9	No TRV		No TRV	
Aniline	62-53-3	No TRV		No TRV	
Benzotrichloride	98-07-7	No TRV		No TRV	
Benzyl chloride	100-44-7	No TRV		No TRV	
Bromobenzene	108-86-1	No TRV		No TRV	
Chlorobenzene	108-90-7	No TRV		1.90E+04	Monsanto Co. (1967), Knapp and others (1971) in IRIS (2002)[a]
Cumene	98-82-8	No TRV		1.10E+05	Wolf and others (1956) in IRIS (2002)[a]
m-Cresol	108-39-4	No TRV		5.00E+03	US EPA (1986g, 1987b) in IRIS (2002)[a]
n-Butyl benzene	104-51-8	No TRV		No TRV	US EPA (1986g, 1987b) in IRIS (2002)[a]
Nitrobenzene	98-95-3	No TRV		4.60E+01	CIIT (1984) in IRIS (2002)[a]
n-Propyl benzene	103-65-1	No TRV		No TRV	
o-Cresol	95-48-7	No TRV		5.00E+03	US EPA (1986g, 1987b) in IRIS (2002)[a]
o-Dinitrobenzene	528-29-0	No TRV		No TRV	
o-Nitroaniline	88-74-4	No TRV		No TRV	
o-Toluidine	95-53-4	No TRV		No TRV	
p-Chloroaniline	106-47-8	No TRV		1.25E+03	NCI (1979a) in IRIS (2002)[a]
p-Cresol	106-44-5	No TRV		No TRV	
Phenol	108-95-2	No TRV		6.00E+04	NTP (1983c) in IRIS (2002)[a]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors			
		Aquatic Biota		Chinook Salmon and Other Salmonids	
		NOAEL TRV	Source	NOAEL TRV	Source
2,6-Dinitrotoluene	606-20-2	6.00E+01	EPA 1999[f]	6.00E+01	EPA 1999[f]
2-Chlorophenol	95-57-8	No TRV		No TRV	
2-Chlorotoluene	95-49-8	No TRV		No TRV	
2-Nitrophenol	88-75-5	No TRV		No TRV	
4,6-Dinitro-o-cresol	534-52-1	No TRV		No TRV	
4-Chlorotoluene	106-43-4	No TRV		No TRV	
4-Nitrophenol	100-02-7	3.00E+02	Tier II Chronic (Suter & Tsao 1996)[d]	6.31E-02	Acute LOAEL for rainbow trout (AQUIRE[8]) × 0.1 for LOAEL-to-NOAEL conversion × 0.1 for acute-to-chronic conversion
alpha-Methylstyrene	98-83-9	No TRV		No TRV	
Aniline	62-53-3	No TRV		No TRV	
Benzotrichloride	98-07-7	No TRV		No TRV	
Benzyl chloride	100-44-7	No TRV		No TRV	
Bromobenzene	108-86-1	No TRV		No TRV	
Chlorobenzene	108-90-7	6.40E+01	Tier II Chronic (Suter & Tsao 1996)[d]	6.40E+01	Tier II Chronic (Suter & Tsao 1996)[d]
Cumene	98-82-8	No TRV		No TRV	
m-Cresol	108-39-4	No TRV		No TRV	
n-Butyl benzene	104-51-8	No TRV		No TRV	
Nitrobenzene	98-95-3	2.70E+02	EPA 1999[f]	2.70E+02	EPA 1999[f]
n-Propyl benzene	103-65-1	No TRV		No TRV	
o-Cresol	95-48-7	1.30E+01	Tier II Chronic (Suter & Tsao 1996)[d]	6.31E-02	Acute LOAEL for rainbow trout (AQUIRE[8]) × 0.1 for LOAEL-to-NOAEL conversion × 0.1 for acute-to-chronic conversion
o-Dinitrobenzene	528-29-0	No TRV		No TRV	
o-Nitroaniline	88-74-4	No TRV		No TRV	
o-Toluidine	95-53-4	No TRV		No TRV	
p-Chloroaniline	106-47-8	No TRV		No TRV	
p-Cresol	106-44-5	No TRV		No TRV	
Phenol	108-95-2	1.10E+02	NAWQC Chronic (Suter & Tsao 1996)[d]	1.10E+02	NAWQC Chronic (Suter & Tsao 1996)[d]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors	
		Benthic Organisms	
		NOAEL TRV	Source
2,6-Dinitrotoluene	606-20-2	1.01E+02	EPA 1999[f]
2-Chlorophenol	95-57-8	No TRV	
2-Chlorotoluene	95-49-8	No TRV	
2-Nitrophenol	88-75-5	No TRV	
4,6-Dinitro-o-cresol	534-52-1	No TRV	
4-Chlorotoluene	106-43-4	No TRV	
4-Nitrophenol	100-02-7	5.24E+02	EqP method (Jones and others 1997)[i]
alpha-Methylstyrene	98-83-9	No TRV	
Aniline	62-53-3	No TRV	
Benzotrichloride	98-07-7	No TRV	
Benzyl chloride	100-44-7	No TRV	
Bromobenzene	108-86-1	No TRV	
Chlorobenzene	108-90-7	5.73E+02	EqP method (Jones and others 1997)[i]
Cumene	98-82-8	No TRV	
m-Cresol	108-39-4	No TRV	
n-Butyl benzene	104-51-8	No TRV	
Nitrobenzene	98-95-3	1.28E+03	EPA 1999[f]
n-Propyl benzene	103-65-1	No TRV	
o-Cresol	95-48-7	2.78E+01	EqP method (Jones and others 1997)[i]
o-Dinitrobenzene	528-29-0	No TRV	
o-Nitroaniline	88-74-4	No TRV	
o-Toluidine	95-53-4	No TRV	
p-Chloroaniline	106-47-8	No TRV	
p-Cresol	106-44-5	No TRV	
Phenol	108-95-2	4.80E+01	Ecology (1994) in EPA (1999a)

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Exposure, Terrestrial Receptors			
		Plant		Terrestrial Invertebrate	
		TRV	Source	TRV	Source
p-Nitrochlorobenzene	100-00-5	No TRV		No TRV	
p-Toluidine	106-49-0	No TRV		No TRV	
sec-Butyl benzene	135-98-8	No TRV		No TRV	
tert-Butyl benzene	98-06-6	No TRV		No TRV	
Toluene-2,6-diamine	823-40-5	No TRV		No TRV	
Trimethyl benzene	25551-13-7	No TRV		No TRV	
Other Light Semivolatile Compounds (molecular weight <200 g/mole)					
1,1'-Biphenyl	92-52-4	6.00E+04	Efroymson and others (1997a)[c]	No TRV	
1,1-Dimethylhydrazine	57-14-7	No TRV		No TRV	
1,2-Dimethylhydrazine	540-73-8	No TRV		No TRV	
1,2-Diphenylhydrazine	122-66-7	No TRV		No TRV	
1,3-Propane sultone	1120-71-4	No TRV		No TRV	
2,4-Toluene diisocyanate	584-84-9	No TRV		No TRV	
2-Chloroacetophenone	532-27-4	No TRV		No TRV	
2-Propenoic acid	79-10-7	No TRV		No TRV	
4,4'-Methylenedianiline	101-77-9	No TRV		No TRV	
Acetophenone	98-86-2	No TRV		No TRV	
Benzoic acid	65-85-0	No TRV		No TRV	
bis(2-Chloroethoxy)methane	111-91-1	No TRV		No TRV	
bis(2-Chloroethyl) ether	111-44-4	No TRV		No TRV	
Chlorocyclopentadiene	41851-50-7	No TRV		No TRV	
Cyclohexanol	108-93-0	No TRV		No TRV	
Dichloroisopropyl ether	108-60-1	No TRV		No TRV	
Dichloromethyl ether	542-88-1	No TRV		No TRV	
Dichloropentadiene	61626-71-9	No TRV		No TRV	
Dimethyl sulfate	77-78-1	No TRV		No TRV	
Dimethylaniline	121-69-7	No TRV		No TRV	
Di-n-propylnitrosamine	621-64-7	No TRV		No TRV	
Diphenyl ether	101-84-8	No TRV		No TRV	
Epichlorohydrin	106-89-8	No TRV		No TRV	
Ethyl carbamate (urethane)	51-79-6	No TRV		No TRV	
Ethyl methanesulfonate	62-50-0	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Mule Deer		Mourning Dove	
		NOAEL TRV	Source	NOAEL TRV	Source
p-Nitrochlorobenzene	100-00-5	No TRV		No TRV	
p-Toluidine	106-49-0	No TRV		No TRV	
sec-Butyl benzene	135-98-8	No TRV		No TRV	
tert-Butyl benzene	98-06-6	No TRV		No TRV	
Toluene-2,6-diamine	823-40-5	No TRV		No TRV	
Trimethyl benzene	25551-13-7	No TRV		No TRV	
Other Light Semivolatile Compounds (molecular weight <200 g/mole)					
1,1'-Biphenyl	92-52-4	5.00E+04	Ambrose and others (1960) in IRIS (2002)[a]	No TRV	
1,1-Dimethylhydrazine	57-14-7	No TRV		No TRV	
1,2-Dimethylhydrazine	540-73-8	No TRV		No TRV	
1,2-Diphenylhydrazine	122-66-7	No TRV		No TRV	
1,3-Propane sultone	1120-71-4	No TRV		No TRV	
2,4-Toluene diisocyanate	584-84-9	No TRV		No TRV	
2-Chloroacetophenone	532-27-4	No TRV		No TRV	
2-Propenoic acid	79-10-7	5.30E+03	BASF (1993) in IRIS (2002)[a]	No TRV	
4,4'-Methylenedianiline	101-77-9	No TRV		No TRV	
Acetophenone	98-86-2	4.23E+04	Hagen and others (1967) in IRIS (2002)[a]	No TRV	
Benzoic acid	65-85-0	4.00E+03	Shtenberg and Ignat'ev (1970) in IRIS (2002)[a]	No TRV	
bis(2-Chloroethoxy)methane	111-91-1	No TRV		No TRV	
bis(2-Chloroethyl) ether	111-44-4	No TRV		No TRV	
Chlorocyclopentadiene	41851-50-7	No TRV		No TRV	
Cyclohexanol	108-93-0	No TRV		No TRV	
Dichloroisopropyl ether	108-60-1	No TRV		No TRV	
Dichloromethyl ether	542-88-1	No TRV		No TRV	
Dichloropentadiene	61626-71-9	No TRV		No TRV	
Dimethyl sulfate	77-78-1	No TRV		No TRV	
Dimethylaniline	121-69-7	2.23E+02	Abdo and others (1984b) in IRIS (2002)[a]	No TRV	
Di-n-propylnitrosamine	621-64-7	No TRV		No TRV	
Diphenyl ether	101-84-8	No TRV		No TRV	
Epichlorohydrin	106-89-8	No TRV		No TRV	
Ethyl carbamate (urethane)	51-79-6	No TRV		No TRV	
Ethyl methanesulfonate	62-50-0	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Great Basin Pocket Mouse		Western Meadowlark	
		NOAEL TRV	Source	NOAEL TRV	Source
p-Nitrochlorobenzene	100-00-5	No TRV		No TRV	
p-Toluidine	106-49-0	No TRV		No TRV	
sec-Butyl benzene	135-98-8	No TRV		No TRV	
tert-Butyl benzene	98-06-6	No TRV		No TRV	
Toluene-2,6-diamine	823-40-5	No TRV		No TRV	
Trimethyl benzene	25551-13-7	No TRV		No TRV	
Other Light Semivolatile Compounds (molecular weight <200 g/mole)					
1,1'-Biphenyl	92-52-4	5.00E+04	Ambrose and others (1960) in IRIS (2002)[a]	No TRV	
1,1-Dimethylhydrazine	57-14-7	No TRV		No TRV	
1,2-Dimethylhydrazine	540-73-8	No TRV		No TRV	
1,2-Diphenylhydrazine	122-66-7	No TRV		No TRV	
1,3-Propane sultone	1120-71-4	No TRV		No TRV	
2,4-Toluene diisocyanate	584-84-9	No TRV		No TRV	
2-Chloroacetophenone	532-27-4	No TRV		No TRV	
2-Propenoic acid	79-10-7	5.30E+03	BASF (1993) in IRIS (2002)[a]	No TRV	
4,4'-Methylenedianiline	101-77-9	No TRV		No TRV	
Acetophenone	98-86-2	4.23E+04	Hagen and others (1967) in IRIS (2002)[a]	No TRV	
Benzoic acid	65-85-0	4.00E+03	Shtenberg and Ignat'ev (1970) in IRIS (2002)[a]	No TRV	
bis(2-Chloroethoxy)methane	111-91-1	No TRV		No TRV	
bis(2-Chloroethyl) ether	111-44-4	No TRV		No TRV	
Chlorocyclopentadiene	41851-50-7	No TRV		No TRV	
Cyclohexanol	108-93-0	No TRV		No TRV	
Dichloroisopropyl ether	108-60-1	No TRV		No TRV	
Dichloromethyl ether	542-88-1	No TRV		No TRV	
Dichloropentadiene	61626-71-9	No TRV		No TRV	
Dimethyl sulfate	77-78-1	No TRV		No TRV	
Dimethylaniline	121-69-7	2.23E+02	Abdo and others (1984b) in IRIS (2002)[a]	No TRV	
Di-n-propylnitrosamine	621-64-7	No TRV		No TRV	
Diphenyl ether	101-84-8	No TRV		No TRV	
Epichlorohydrin	106-89-8	No TRV		No TRV	
Ethyl carbamate (urethane)	51-79-6	No TRV		No TRV	
Ethyl methanesulfonate	62-50-0	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Coyote		Burrowing Owl	
		NOAEL TRV	Source	NOAEL TRV	Source
p-Nitrochlorobenzene	100-00-5	No TRV		No TRV	
p-Toluidine	106-49-0	No TRV		No TRV	
sec-Butyl benzene	135-98-8	No TRV		No TRV	
tert-Butyl benzene	98-06-6	No TRV		No TRV	
Toluene-2,6-diamine	823-40-5	No TRV		No TRV	
Trimethyl benzene	25551-13-7	No TRV		No TRV	
Other Light Semivolatile Compounds (molecular weight <200 g/mole)					
1,1'-Biphenyl	92-52-4	5.00E+04	Ambrose and others (1960) in IRIS (2002)[a]	No TRV	
1,1-Dimethylhydrazine	57-14-7	No TRV		No TRV	
1,2-Dimethylhydrazine	540-73-8	No TRV		No TRV	
1,2-Diphenylhydrazine	122-66-7	No TRV		No TRV	
1,3-Propane sultone	1120-71-4	No TRV		No TRV	
2,4-Toluene diisocyanate	584-84-9	No TRV		No TRV	
2-Chloroacetophenone	532-27-4	No TRV		No TRV	
2-Propenoic acid	79-10-7	5.30E+03	BASF (1993) in IRIS (2002)[a]	No TRV	
4,4'-Methylenedianiline	101-77-9	No TRV		No TRV	
Acetophenone	98-86-2	4.23E+04	Hagen and others (1967) in IRIS (2002)[a]	No TRV	
Benzoic acid	65-85-0	4.00E+03	Shtenberg and Ignat'ev (1970) in IRIS (2002)[a]	No TRV	
bis(2-Chloroethoxy)methane	111-91-1	No TRV		No TRV	
bis(2-Chloroethyl) ether	111-44-4	No TRV		No TRV	
Chlorocyclopentadiene	41851-50-7	No TRV		No TRV	
Cyclohexanol	108-93-0	No TRV		No TRV	
Dichloroisopropyl ether	108-60-1	No TRV		No TRV	
Dichloromethyl ether	542-88-1	No TRV		No TRV	
Dichloropentadiene	61626-71-9	No TRV		No TRV	
Dimethyl sulfate	77-78-1	No TRV		No TRV	
Dimethylaniline	121-69-7	2.23E+02	Abdo and others (1984b) in IRIS (2002)[a]	No TRV	
Di-n-propylnitrosamine	621-64-7	No TRV		No TRV	
Diphenyl ether	101-84-8	No TRV		No TRV	
Epichlorohydrin	106-89-8	No TRV		No TRV	
Ethyl carbamate (urethane)	51-79-6	No TRV		No TRV	
Ethyl methanesulfonate	62-50-0	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures		Ingestion, Aquatic Exposures	
		Red-tailed Hawk		Canada Goose	
		NOAEL TRV	Source	NOAEL TRV	Source
p-Nitrochlorobenzene	100-00-5	No TRV		No TRV	
p-Toluidine	106-49-0	No TRV		No TRV	
sec-Butyl benzene	135-98-8	No TRV		No TRV	
tert-Butyl benzene	98-06-6	No TRV		No TRV	
Toluene-2,6-diamine	823-40-5	No TRV		No TRV	
Trimethyl benzene	25551-13-7	No TRV		No TRV	
	Other Light Semivolatile Compounds (molecular weight <200 g/mole)				
1,1'-Biphenyl	92-52-4	No TRV		No TRV	
1,1-Dimethylhydrazine	57-14-7	No TRV		No TRV	
1,2-Dimethylhydrazine	540-73-8	No TRV		No TRV	
1,2-Diphenylhydrazine	122-66-7	No TRV		No TRV	
1,3-Propane sultone	1120-71-4	No TRV		No TRV	
2,4-Toluene diisocyanate	584-84-9	No TRV		No TRV	
2-Chloroacetophenone	532-27-4	No TRV		No TRV	
2-Propenoic acid	79-10-7	No TRV		No TRV	
4,4'-Methylenedianiline	101-77-9	No TRV		No TRV	
Acetophenone	98-86-2	No TRV		No TRV	
Benzoic acid	65-85-0	No TRV		No TRV	
bis(2-Chloroethoxy)methane	111-91-1	No TRV		No TRV	
bis(2-Chloroethyl) ether	111-44-4	No TRV		No TRV	
Chlorocyclopentadiene	41851-50-7	No TRV		No TRV	
Cyclohexanol	108-93-0	No TRV		No TRV	
Dichloroisopropyl ether	108-60-1	No TRV		No TRV	
Dichloromethyl ether	542-88-1	No TRV		No TRV	
Dichloropentadiene	61626-71-9	No TRV		No TRV	
Dimethyl sulfate	77-78-1	No TRV		No TRV	
Dimethylaniline	121-69-7	No TRV		No TRV	
Di-n-propylnitrosamine	621-64-7	No TRV		No TRV	
Diphenyl ether	101-84-8	No TRV		No TRV	
Epichlorohydrin	106-89-8	No TRV		No TRV	
Ethyl carbamate (urethane)	51-79-6	No TRV		No TRV	
Ethyl methanesulfonate	62-50-0	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Spotted Sandpiper		Great Blue Heron	
		NOAEL TRV	Source	NOAEL TRV	Source
p-Nitrochlorobenzene	100-00-5	No TRV		No TRV	
p-Toluidine	106-49-0	No TRV		No TRV	
sec-Butyl benzene	135-98-8	No TRV		No TRV	
tert-Butyl benzene	98-06-6	No TRV		No TRV	
Toluene-2,6-diamine	823-40-5	No TRV		No TRV	
Trimethyl benzene	25551-13-7	No TRV		No TRV	
	Other Light Semivolatile Compounds (molecular weight <200 g/mole)				
1,1'-Biphenyl	92-52-4	No TRV		No TRV	
1,1-Dimethylhydrazine	57-14-7	No TRV		No TRV	
1,2-Dimethylhydrazine	540-73-8	No TRV		No TRV	
1,2-Diphenylhydrazine	122-66-7	No TRV		No TRV	
1,3-Propane sultone	1120-71-4	No TRV		No TRV	
2,4-Toluene diisocyanate	584-84-9	No TRV		No TRV	
2-Chloroacetophenone	532-27-4	No TRV		No TRV	
2-Propenoic acid	79-10-7	No TRV		No TRV	
4,4'-Methylenedianiline	101-77-9	No TRV		No TRV	
Acetophenone	98-86-2	No TRV		No TRV	
Benzoic acid	65-85-0	No TRV		No TRV	
bis(2-Chloroethoxy)methane	111-91-1	No TRV		No TRV	
bis(2-Chloroethyl) ether	111-44-4	No TRV		No TRV	
Chlorocyclopentadiene	41851-50-7	No TRV		No TRV	
Cyclohexanol	108-93-0	No TRV		No TRV	
Dichloroisopropyl ether	108-60-1	No TRV		No TRV	
Dichloromethyl ether	542-88-1	No TRV		No TRV	
Dichloropentadiene	61626-71-9	No TRV		No TRV	
Dimethyl sulfate	77-78-1	No TRV		No TRV	
Dimethylaniline	121-69-7	No TRV		No TRV	
Di-n-propylnitrosamine	621-64-7	No TRV		No TRV	
Diphenyl ether	101-84-8	No TRV		No TRV	
Epichlorohydrin	106-89-8	No TRV		No TRV	
Ethyl carbamate (urethane)	51-79-6	No TRV		No TRV	
Ethyl methanesulfonate	62-50-0	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Bald Eagle		Mink	
		NOAEL TRV	Source	NOAEL TRV	Source
p-Nitrochlorobenzene	100-00-5	No TRV		No TRV	
p-Toluidine	106-49-0	No TRV		No TRV	
sec-Butyl benzene	135-98-8	No TRV		No TRV	
tert-Butyl benzene	98-06-6	No TRV		No TRV	
Toluene-2,6-diamine	823-40-5	No TRV		No TRV	
Trimethyl benzene	25551-13-7	No TRV		No TRV	
	Other Light Semivolatile Compounds (molecular weight <200 g/mole)				
1,1'-Biphenyl	92-52-4	No TRV		5.00E+04	Ambrose and others (1960) in IRIS (2002)[a]
1,1-Dimethylhydrazine	57-14-7	No TRV		No TRV	
1,2-Dimethylhydrazine	540-73-8	No TRV		No TRV	
1,2-Diphenylhydrazine	122-66-7	No TRV		No TRV	
1,3-Propane sultone	1120-71-4	No TRV		No TRV	
2,4-Toluene diisocyanate	584-84-9	No TRV		No TRV	
2-Chloroacetophenone	532-27-4	No TRV		No TRV	
2-Propenoic acid	79-10-7	No TRV		5.30E+03	BASF (1993) in IRIS (2002)[a]
4,4'-Methylenedianiline	101-77-9	No TRV		No TRV	
Acetophenone	98-86-2	No TRV		4.23E+04	Hagen and others (1967) in IRIS (2002)[a]
Benzoic acid	65-85-0	No TRV		4.00E+03	Shtenberg and Ignat'ev (1970) in IRIS (2002)[a]
bis(2-Chloroethoxy)methane	111-91-1	No TRV		No TRV	
bis(2-Chloroethyl) ether	111-44-4	No TRV		No TRV	
Chlorocyclopentadiene	41851-50-7	No TRV		No TRV	
Cyclohexanol	108-93-0	No TRV		No TRV	
Dichloroisopropyl ether	108-60-1	No TRV		No TRV	
Dichloromethyl ether	542-88-1	No TRV		No TRV	
Dichloropentadiene	61626-71-9	No TRV		No TRV	
Dimethyl sulfate	77-78-1	No TRV		No TRV	
Dimethylaniline	121-69-7	No TRV		2.23E+02	Abdo and others (1984b) in IRIS (2002)[a]
Di-n-propylnitrosamine	621-64-7	No TRV		No TRV	
Diphenyl ether	101-84-8	No TRV		No TRV	
Epichlorohydrin	106-89-8	No TRV		No TRV	
Ethyl carbamate (urethane)	51-79-6	No TRV		No TRV	
Ethyl methanesulfonate	62-50-0	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors			
		Aquatic Biota		Chinook Salmon and Other Salmonids	
		NOAEL TRV	Source	NOAEL TRV	Source
p-Nitrochlorobenzene	100-00-5	No TRV		No TRV	
p-Toluidine	106-49-0	No TRV		No TRV	
sec-Butyl benzene	135-98-8	No TRV		No TRV	
tert-Butyl benzene	98-06-6	No TRV		No TRV	
Toluene-2,6-diamine	823-40-5	No TRV		No TRV	
Trimethyl benzene	25551-13-7	No TRV		No TRV	
Other Light Semivolatile Compounds (molecular weight <200 g/mole)					
1,1'-Biphenyl	92-52-4	1.40E+01	Tier II Chronic (Suter & Tsao 1996)[d]	1.40E+01	Tier II Chronic (Suter & Tsao 1996)[d]
1,1-Dimethylhydrazine	57-14-7	No TRV		No TRV	
1,2-Dimethylhydrazine	540-73-8	No TRV		No TRV	
1,2-Diphenylhydrazine	122-66-7	2.70E+00	EPA 1987[b]	2.70E+00	EPA 1987[b]
1,3-Propane sultone	1120-71-4	No TRV		No TRV	
2,4-Toluene diisocyanate	584-84-9	No TRV		No TRV	
2-Chloroacetophenone	532-27-4	No TRV		No TRV	
2-Propenoic acid	79-10-7	No TRV		No TRV	
4,4'-Methylenedianiline	101-77-9	No TRV		No TRV	
Acetophenone	98-86-2	No TRV		No TRV	
Benzoic acid	65-85-0	4.20E+01	Tier II Chronic (Suter & Tsao 1996)[d]	4.20E+01	Tier II Chronic (Suter & Tsao 1996)[d]
bis(2-Chloroethoxy)methane	111-91-1	No TRV		No TRV	
bis(2-Chloroethyl) ether	111-44-4	No TRV		No TRV	
Chlorocyclopentadiene	41851-50-7	No TRV		No TRV	
Cyclohexanol	108-93-0	No TRV		No TRV	
Dichloroisopropyl ether	108-60-1	No TRV		No TRV	
Dichloromethyl ether	542-88-1	No TRV		No TRV	
Dichloropentadiene	61626-71-9	No TRV		No TRV	
Dimethyl sulfate	77-78-1	No TRV		No TRV	
Dimethylaniline	121-69-7	No TRV		No TRV	
Di-n-propylnitrosamine	621-64-7	No TRV		No TRV	
Diphenyl ether	101-84-8	No TRV		No TRV	
Epichlorohydrin	106-89-8	No TRV		No TRV	
Ethyl carbamate (urethane)	51-79-6	No TRV		No TRV	
Ethyl methanesulfonate	62-50-0	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors	
		Benthic Organisms	
		NOAEL TRV	Source
p-Nitrochlorobenzene	100-00-5	No TRV	
p-Toluidine	106-49-0	No TRV	
sec-Butyl benzene	135-98-8	No TRV	
tert-Butyl benzene	98-06-6	No TRV	
Toluene-2,6-diamine	823-40-5	No TRV	
Trimethyl benzene	25551-13-7	No TRV	
Other Light Semivolatile Compounds (molecular weight <200 g/mole)			
1,1'-Biphenyl	92-52-4	No TRV	
1,1-Dimethylhydrazine	57-14-7	No TRV	
1,2-Dimethylhydrazine	540-73-8	No TRV	
1,2-Diphenylhydrazine	122-66-7	No TRV	
1,3-Propane sultone	1120-71-4	No TRV	
2,4-Toluene diisocyanate	584-84-9	No TRV	
2-Chloroacetophenone	532-27-4	No TRV	
2-Propenoic acid	79-10-7	No TRV	
4,4'-Methylenedianiline	101-77-9	No TRV	
Acetophenone	98-86-2	No TRV	
Benzoic acid	65-85-0	No TRV	
bis(2-Chloroethoxy)methane	111-91-1	No TRV	
bis(2-Chloroethyl) ether	111-44-4	No TRV	
Chlorocyclopentadiene	41851-50-7	No TRV	
Cyclohexanol	108-93-0	No TRV	
Dichloroisopropyl ether	108-60-1	No TRV	
Dichloromethyl ether	542-88-1	No TRV	
Dichloropentadiene	61626-71-9	No TRV	
Dimethyl sulfate	77-78-1	No TRV	
Dimethylaniline	121-69-7	No TRV	
Di-n-propylnitrosamine	621-64-7	No TRV	
Diphenyl ether	101-84-8	No TRV	
Epichlorohydrin	106-89-8	No TRV	
Ethyl carbamate (urethane)	51-79-6	No TRV	
Ethyl methanesulfonate	62-50-0	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Exposure, Terrestrial Receptors			
		Plant		Terrestrial Invertebrate	
		TRV	Source	TRV	Source
Ethylene dibromide	106-93-4	No TRV		No TRV	
Ethylene glycol	107-21-1	No TRV		No TRV	
Ethylene glycol monobutyl ether	111-76-2	No TRV		No TRV	
Ethylene glycol monoethyl ether acetate	111-15-9	No TRV		No TRV	
Ethylene thiourea	96-45-7	No TRV		No TRV	
Furfural	98-01-1	No TRV		No TRV	
Maleic hydrazide	123-33-1	No TRV		No TRV	
Malononitrile	109-77-3	No TRV		No TRV	
Methyl styrene (mixed isomers)	25013-15-4	No TRV		No TRV	
Methylhydrazine	60-34-4	No TRV		No TRV	
N,N-Diphenylamine	122-39-4	No TRV		No TRV	
Nitric acid, propyl ester	627-13-4	No TRV		No TRV	
N-Nitrosodi-n-butylamine	924-16-3	No TRV		No TRV	
N-Nitrosomorpholine	59-89-2	No TRV		No TRV	
N-Nitroso-N,N-dimethylamine	62-75-9	No TRV		No TRV	
o-Anisidine	90-04-0	No TRV		No TRV	
Oxalic acid	144-62-7	No TRV		No TRV	
Phthalic anhydride	85-44-9	No TRV		No TRV	
p-Phthalic acid	100-21-0	No TRV		No TRV	
Pyridine	110-86-1	No TRV		No TRV	
Quinoline	91-22-5	No TRV		No TRV	
Quinone	106-51-4	No TRV		No TRV	
Safrole	94-59-7	No TRV		No TRV	
Tetrahydrofuran	109-99-9	No TRV		No TRV	
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)					
1,2,4,5-Tetrachlorobenzene	95-94-3	No TRV		No TRV	
1,3,5-Trinitrobenzene	99-35-4	No TRV		No TRV	
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	No TRV		No TRV	
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Mule Deer		Mourning Dove	
		NOAEL TRV	Source	NOAEL TRV	Source
Ethylene dibromide	106-93-4	No TRV		No TRV	
Ethylene glycol	107-21-1	2.00E+04	DePass and others (1996a) in IRIS (2002)[a]	No TRV	
Ethylene glycol monobutyl ether	111-76-2	5.10E+02	NTP (1993) in IRIS (2002)[a]	No TRV	
Ethylene glycol monoethyl ether acetate	111-15-9	No TRV		No TRV	
Ethylene thiourea	96-45-7	2.50E+01	Graham and others (1975) in IRIS (2002)[a]	No TRV	
Furfural	98-01-1	7.90E+01	NTP (1981) in IRIS (2002)[a]	No TRV	
Maleic hydrazide	123-33-1	5.00E+04	Uniroyal Chemical Co (1981) in IRIS (2002)[a]	No TRV	
Malononitrile	109-77-3	No TRV		No TRV	
Methyl styrene (mixed isomers)	25013-15-4	No TRV		No TRV	
Methylhydrazine	60-34-4	No TRV		No TRV	
N,N-Diphenylamine	122-39-4	2.50E+02	Thomas and others (1967) in IRIS (2002)[a]	No TRV	
Nitric acid, propyl ester	627-13-4	No TRV		No TRV	
N-Nitrosodi-n-butylamine	924-16-3	No TRV		No TRV	
N-Nitrosomorpholine	59-89-2	No TRV		No TRV	
N-Nitroso-N,N-dimethylamine	62-75-9	No TRV		No TRV	
o-Anisidine	90-04-0	No TRV		No TRV	
Oxalic acid	144-62-7	No TRV		No TRV	
Phthalic anhydride	85-44-9	1.56E+05	NCI (1979b) in IRIS (2002)[a]	No TRV	
p-Phthalic acid	100-21-0	No TRV		No TRV	
Pyridine	110-86-1	1.00E+02	US EPA (1986h) in IRIS (2002)[a]	No TRV	
Quinoline	91-22-5	No TRV		No TRV	
Quinone	106-51-4	No TRV		No TRV	
Safrole	94-59-7	No TRV		No TRV	
Tetrahydrofuran	109-99-9	No TRV		No TRV	
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)					
1,2,4,5-Tetrachlorobenzene	95-94-3	3.40E+01	Chu and others (1984) in IRIS (2002)[a]	No TRV	
1,3,5-Trinitrobenzene	99-35-4	2.68E+03	Reddy and others (1997) in IRIS (2002)[a]	No TRV	
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	No TRV		No TRV	
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	2.00E+01	Horner (1942) in IRIS (2002)[a]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Great Basin Pocket Mouse		Western Meadowlark	
		NOAEL TRV	Source	NOAEL TRV	Source
Ethylene dibromide	106-93-4	No TRV		No TRV	
Ethylene glycol	107-21-1	2.00E+04	DePass and others (1996a) in IRIS (2002)[a]	No TRV	
Ethylene glycol monobutyl ether	111-76-2	5.10E+02	NTP (1993) in IRIS (2002)[a]	No TRV	
Ethylene glycol monoethyl ether acetate	111-15-9	No TRV		No TRV	
Ethylene thiourea	96-45-7	2.50E+01	Graham and others (1975) in IRIS (2002)[a]	No TRV	
Furfural	98-01-1	7.90E+01	NTP (1981) in IRIS (2002)[a]	No TRV	
Maleic hydrazide	123-33-1	5.00E+04	Uniroyal Chemical Co (1981) in IRIS (2002)[a]	No TRV	
Malononitrile	109-77-3	No TRV		No TRV	
Methyl styrene (mixed isomers)	25013-15-4	No TRV		No TRV	
Methylhydrazine	60-34-4	No TRV		No TRV	
N,N-Diphenylamine	122-39-4	2.50E+02	Thomas and others (1967) in IRIS (2002)[a]	No TRV	
Nitric acid, propyl ester	627-13-4	No TRV		No TRV	
N-Nitrosodi-n-butylamine	924-16-3	No TRV		No TRV	
N-Nitrosomorpholine	59-89-2	No TRV		No TRV	
N-Nitroso-N,N-dimethylamine	62-75-9	No TRV		No TRV	
o-Anisidine	90-04-0	No TRV		No TRV	
Oxalic acid	144-62-7	No TRV		No TRV	
Phthalic anhydride	85-44-9	1.56E+05	NCI (1979b) in IRIS (2002)[a]	No TRV	
p-Phthalic acid	100-21-0	No TRV		No TRV	
Pyridine	110-86-1	1.00E+02	US EPA (1986h) in IRIS (2002)[a]	No TRV	
Quinoline	91-22-5	No TRV		No TRV	
Quinone	106-51-4	No TRV		No TRV	
Safrole	94-59-7	No TRV		No TRV	
Tetrahydrofuran	109-99-9	No TRV		No TRV	
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)					
1,2,4,5-Tetrachlorobenzene	95-94-3	3.40E+01	Chu and others (1984) in IRIS (2002)[a]	No TRV	
1,3,5-Trinitrobenzene	99-35-4	2.68E+03	Reddy and others (1997) in IRIS (2002)[a]	No TRV	
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	No TRV		No TRV	
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	2.00E+01	Horner (1942) in IRIS (2002)[a]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Coyote		Burrowing Owl	
		NOAEL TRV	Source	NOAEL TRV	Source
Ethylene dibromide	106-93-4	No TRV		No TRV	
Ethylene glycol	107-21-1	2.00E+04	DePass and others (1996a) in IRIS (2002)[a]	No TRV	
Ethylene glycol monobutyl ether	111-76-2	5.10E+02	NTP (1993) in IRIS (2002)[a]	No TRV	
Ethylene glycol monoethyl ether acetate	111-15-9	No TRV		No TRV	
Ethylene thiourea	96-45-7	2.50E+01	Graham and others (1975) in IRIS (2002)[a]	No TRV	
Furfural	98-01-1	7.90E+01	NTP (1981) in IRIS (2002)[a]	No TRV	
Maleic hydrazide	123-33-1	5.00E+04	Uniroyal Chemical Co (1981) in IRIS (2002)[a]	No TRV	
Malononitrile	109-77-3	No TRV		No TRV	
Methyl styrene (mixed isomers)	25013-15-4	No TRV		No TRV	
Methylhydrazine	60-34-4	No TRV		No TRV	
N,N-Diphenylamine	122-39-4	2.50E+02	Thomas and others (1967) in IRIS (2002)[a]	No TRV	
Nitric acid, propyl ester	627-13-4	No TRV		No TRV	
N-Nitrosodi-n-butylamine	924-16-3	No TRV		No TRV	
N-Nitrosomorpholine	59-89-2	No TRV		No TRV	
N-Nitroso-N,N-dimethylamine	62-75-9	No TRV		No TRV	
o-Anisidine	90-04-0	No TRV		No TRV	
Oxalic acid	144-62-7	No TRV		No TRV	
Phthalic anhydride	85-44-9	1.56E+05	NCI (1979b) in IRIS (2002)[a]	No TRV	
p-Phthalic acid	100-21-0	No TRV		No TRV	
Pyridine	110-86-1	1.00E+02	US EPA (1986h) in IRIS (2002)[a]	No TRV	
Quinoline	91-22-5	No TRV		No TRV	
Quinone	106-51-4	No TRV		No TRV	
Safrole	94-59-7	No TRV		No TRV	
Tetrahydrofuran	109-99-9	No TRV		No TRV	
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)					
1,2,4,5-Tetrachlorobenzene	95-94-3	3.40E+01	Chu and others (1984) in IRIS (2002)[a]	No TRV	
1,3,5-Trinitrobenzene	99-35-4	2.68E+03	Reddy and others (1997) in IRIS (2002)[a]	No TRV	
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	No TRV		No TRV	
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	2.00E+01	Horner (1942) in IRIS (2002)[a]	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures		Ingestion, Aquatic Exposures	
		Red-tailed Hawk		Canada Goose	
		NOAEL TRV	Source	NOAEL TRV	Source
Ethylene dibromide	106-93-4	No TRV		No TRV	
Ethylene glycol	107-21-1	No TRV		No TRV	
Ethylene glycol monobutyl ether	111-76-2	No TRV		No TRV	
Ethylene glycol monoethyl ether acetate	111-15-9	No TRV		No TRV	
Ethylene thiourea	96-45-7	No TRV		No TRV	
Furfural	98-01-1	No TRV		No TRV	
Maleic hydrazide	123-33-1	No TRV		No TRV	
Malononitrile	109-77-3	No TRV		No TRV	
Methyl styrene (mixed isomers)	25013-15-4	No TRV		No TRV	
Methylhydrazine	60-34-4	No TRV		No TRV	
N,N-Diphenylamine	122-39-4	No TRV		No TRV	
Nitric acid, propyl ester	627-13-4	No TRV		No TRV	
N-Nitrosodi-n-butylamine	924-16-3	No TRV		No TRV	
N-Nitrosomorpholine	59-89-2	No TRV		No TRV	
N-Nitroso-N,N-dimethylamine	62-75-9	No TRV		No TRV	
o-Anisidine	90-04-0	No TRV		No TRV	
Oxalic acid	144-62-7	No TRV		No TRV	
Phthalic anhydride	85-44-9	No TRV		No TRV	
p-Phthalic acid	100-21-0	No TRV		No TRV	
Pyridine	110-86-1	No TRV		No TRV	
Quinoline	91-22-5	No TRV		No TRV	
Quinone	106-51-4	No TRV		No TRV	
Safrole	94-59-7	No TRV		No TRV	
Tetrahydrofuran	109-99-9	No TRV		No TRV	
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)					
1,2,4,5-Tetrachlorobenzene	95-94-3	No TRV		No TRV	
1,3,5-Trinitrobenzene	99-35-4	No TRV		No TRV	
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	No TRV		No TRV	
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Spotted Sandpiper		Great Blue Heron	
		NOAEL TRV	Source	NOAEL TRV	Source
Ethylene dibromide	106-93-4	No TRV		No TRV	
Ethylene glycol	107-21-1	No TRV		No TRV	
Ethylene glycol monobutyl ether	111-76-2	No TRV		No TRV	
Ethylene glycol monoethyl ether acetate	111-15-9	No TRV		No TRV	
Ethylene thiourea	96-45-7	No TRV		No TRV	
Furfural	98-01-1	No TRV		No TRV	
Maleic hydrazide	123-33-1	No TRV		No TRV	
Malononitrile	109-77-3	No TRV		No TRV	
Methyl styrene (mixed isomers)	25013-15-4	No TRV		No TRV	
Methylhydrazine	60-34-4	No TRV		No TRV	
N,N-Diphenylamine	122-39-4	No TRV		No TRV	
Nitric acid, propyl ester	627-13-4	No TRV		No TRV	
N-Nitrosodi-n-butylamine	924-16-3	No TRV		No TRV	
N-Nitrosomorpholine	59-89-2	No TRV		No TRV	
N-Nitroso-N,N-dimethylamine	62-75-9	No TRV		No TRV	
o-Anisidine	90-04-0	No TRV		No TRV	
Oxalic acid	144-62-7	No TRV		No TRV	
Phthalic anhydride	85-44-9	No TRV		No TRV	
p-Phthalic acid	100-21-0	No TRV		No TRV	
Pyridine	110-86-1	No TRV		No TRV	
Quinoline	91-22-5	No TRV		No TRV	
Quinone	106-51-4	No TRV		No TRV	
Safrole	94-59-7	No TRV		No TRV	
Tetrahydrofuran	109-99-9	No TRV		No TRV	
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)					
1,2,4,5-Tetrachlorobenzene	95-94-3	No TRV		No TRV	
1,3,5-Trinitrobenzene	99-35-4	No TRV		No TRV	
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	No TRV		No TRV	
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Bald Eagle		Mink	
		NOAEL TRV	Source	NOAEL TRV	Source
Ethylene dibromide	106-93-4	No TRV		No TRV	
Ethylene glycol	107-21-1	No TRV		2.00E+04	DePass and others (1996a) in IRIS (2002)[a]
Ethylene glycol monobutyl ether	111-76-2	No TRV		5.10E+02	NTP (1993) in IRIS (2002)[a]
Ethylene glycol monoethyl ether acetate	111-15-9	No TRV		No TRV	
Ethylene thiourea	96-45-7	No TRV		2.50E+01	Graham and others (1975) in IRIS (2002)[a]
Furfural	98-01-1	No TRV		7.90E+01	NTP (1981) in IRIS (2002)[a]
Maleic hydrazide	123-33-1	No TRV		5.00E+04	Uniroyal Chemical Co (1981) in IRIS (2002)[a]
Malononitrile	109-77-3	No TRV		No TRV	
Methyl styrene (mixed isomers)	25013-15-4	No TRV		No TRV	
Methylhydrazine	60-34-4	No TRV		No TRV	
N,N-Diphenylamine	122-39-4	No TRV		2.50E+02	Thomas and others (1967) in IRIS (2002)[a]
Nitric acid, propyl ester	627-13-4	No TRV		No TRV	
N-Nitrosodi-n-butylamine	924-16-3	No TRV		No TRV	
N-Nitrosomorpholine	59-89-2	No TRV		No TRV	
N-Nitroso-N,N-dimethylamine	62-75-9	No TRV		No TRV	
o-Anisidine	90-04-0	No TRV		No TRV	
Oxalic acid	144-62-7	No TRV		No TRV	
Phthalic anhydride	85-44-9	No TRV		1.56E+05	NCI (1979b) in IRIS (2002)[a]
p-Phthalic acid	100-21-0	No TRV		No TRV	
Pyridine	110-86-1	No TRV		1.00E+02	US EPA (1986h) in IRIS (2002)[a]
Quinoline	91-22-5	No TRV		No TRV	
Quinone	106-51-4	No TRV		No TRV	
Safrole	94-59-7	No TRV		No TRV	
Tetrahydrofuran	109-99-9	No TRV		No TRV	
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)					
1,2,4,5-Tetrachlorobenzene	95-94-3	No TRV		3.40E+01	Chu and others (1984) in IRIS (2002)[a]
1,3,5-Trinitrobenzene	99-35-4	No TRV		2.68E+03	Reddy and others (1997) in IRIS (2002)[a]
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	No TRV		No TRV	
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	No TRV		2.00E+01	Horner (1942) in IRIS (2002)[a]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors			
		Aquatic Biota		Chinook Salmon and Other Salmonids	
		NOAEL TRV	Source	NOAEL TRV	Source
Ethylene dibromide	106-93-4	No TRV		No TRV	
Ethylene glycol	107-21-1	No TRV		No TRV	
Ethylene glycol monobutyl ether	111-76-2	No TRV		No TRV	
Ethylene glycol monoethyl ether acetate	111-15-9	No TRV		No TRV	
Ethylene thiourea	96-45-7	No TRV		No TRV	
Furfural	98-01-1	No TRV		No TRV	
Maleic hydrazide	123-33-1	No TRV		No TRV	
Malononitrile	109-77-3	No TRV		No TRV	
Methyl styrene (mixed isomers)	25013-15-4	No TRV		No TRV	
Methylhydrazine	60-34-4	No TRV		No TRV	
N,N-Diphenylamine	122-39-4	No TRV		No TRV	
Nitric acid, propyl ester	627-13-4	No TRV		No TRV	
N-Nitrosodi-n-butylamine	924-16-3	No TRV		No TRV	
N-Nitrosomorpholine	59-89-2	No TRV		No TRV	
N-Nitroso-N,N-dimethylamine	62-75-9	No TRV		No TRV	
o-Anisidine	90-04-0	No TRV		No TRV	
Oxalic acid	144-62-7	No TRV		No TRV	
Phthalic anhydride	85-44-9	No TRV		No TRV	
p-Phthalic acid	100-21-0	No TRV		No TRV	
Pyridine	110-86-1	No TRV		No TRV	
Quinoline	91-22-5	No TRV		No TRV	
Quinone	106-51-4	No TRV		No TRV	
Safrole	94-59-7	No TRV		No TRV	
Tetrahydrofuran	109-99-9	No TRV		No TRV	
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)					
1,2,4,5-Tetrachlorobenzene	95-94-3	No TRV		No TRV	
1,3,5-Trinitrobenzene	99-35-4	No TRV		1.30E+00	Chronic LOAEL for rainbow trout (Suter and Tsao 1996[d] Table C-1) × 0.1 for LOAEL-to-NOAEL conversion
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	No TRV		No TRV	
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors	
		Benthic Organisms	
		NOAEL TRV	Source
Ethylene dibromide	106-93-4	No TRV	
Ethylene glycol	107-21-1	No TRV	
Ethylene glycol monobutyl ether	111-76-2	No TRV	
Ethylene glycol monoethyl ether acetate	111-15-9	No TRV	
Ethylene thiourea	96-45-7	No TRV	
Furfural	98-01-1	No TRV	
Maleic hydrazide	123-33-1	No TRV	
Malononitrile	109-77-3	No TRV	
Methyl styrene (mixed isomers)	25013-15-4	No TRV	
Methylhydrazine	60-34-4	No TRV	
N,N-Diphenylamine	122-39-4	No TRV	
Nitric acid, propyl ester	627-13-4	No TRV	
N-Nitrosodi-n-butylamine	924-16-3	No TRV	
N-Nitrosomorpholine	59-89-2	No TRV	
N-Nitroso-N,N-dimethylamine	62-75-9	No TRV	
o-Anisidine	90-04-0	No TRV	
Oxalic acid	144-62-7	No TRV	
Phthalic anhydride	85-44-9	No TRV	
p-Phthalic acid	100-21-0	No TRV	
Pyridine	110-86-1	No TRV	
Quinoline	91-22-5	No TRV	
Quinone	106-51-4	No TRV	
Safrole	94-59-7	No TRV	
Tetrahydrofuran	109-99-9	No TRV	
Other Heavy Semivolatile Compounds (molecular weight >200 g/mole)			
1,2,4,5-Tetrachlorobenzene	95-94-3	No TRV	
1,3,5-Trinitrobenzene	99-35-4	No TRV	
2,6-Bis(tert-butyl)-4-methylphenol	128-37-0	No TRV	
2-Cyclohexyl-4,6-dinitrophenol	131-89-5	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Exposure, Terrestrial Receptors			
		Plant		Terrestrial Invertebrate	
		TRV	Source	TRV	Source
2-sec-Butyl-4,6-dinitrophenol	88-85-7	No TRV		No TRV	
3,3'-Dichlorobenzidine	91-94-1	No TRV		No TRV	
3,3'-Dimethoxybenzidine	119-90-4	No TRV		No TRV	
4-Bromophenylphenyl ether	101-55-3	No TRV		No TRV	
Ammonium perfluorooctanoate	3825-26-1	No TRV		No TRV	
Azobenzene	103-33-3	No TRV		No TRV	
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)	96-69-5	No TRV		No TRV	
Captan	133-06-2	No TRV		No TRV	
Chlorobenzilate	510-15-6	No TRV		No TRV	
Dibutylphosphate	107-66-4	No TRV		No TRV	
Dimethyl aminoazobenzene	60-11-7	No TRV		No TRV	
Hexachlorobenzene	118-74-1	No TRV		No TRV	
Hexachlorobutadiene	87-68-3	No TRV		No TRV	
Hexachlorocyclopentadiene	77-47-4	1.00E+02	EPA 1999[f]	No TRV	
Hexachloroethane	67-72-1	No TRV		No TRV	
Hexachlorophene	70-30-4	No TRV		No TRV	
Hexamethylene-1,5-diisocyanate	822-06-0	No TRV		No TRV	
Mirex	2385-85-5	No TRV		No TRV	
Nitrofen	1836-75-5	No TRV		No TRV	
Pentachlorobenzene	608-93-5	No TRV		1.15E+03	EPA 1999[f]
Pentachloronitrobenzene	82-68-8	No TRV		No TRV	
Pentachlorophenol	87-86-5	1.73E+03	EPA 1999[f]	1.00E+04	EPA 1999[f]
Picric acid	88-89-1	No TRV		No TRV	
Pronamide	23950-58-5	No TRV		No TRV	
Strychnine	57-24-9	No TRV		No TRV	
Terphenyls	26140-60-3	No TRV		No TRV	
Tributyl phosphate	126-73-8	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Mule Deer		Mourning Dove	
		NOAEL TRV	Source	NOAEL TRV	Source
2-sec-Butyl-4,6-dinitrophenol	88-85-7	No TRV		No TRV	
3,3'-Dichlorobenzidine	91-94-1	No TRV		No TRV	
3,3'-Dimethoxybenzidine	119-90-4	No TRV		No TRV	
4-Bromophenylphenyl ether	101-55-3	No TRV		No TRV	
Ammonium perfluorooctanoate	3825-26-1	No TRV		No TRV	
Azobenzene	103-33-3	No TRV		No TRV	
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)s	96-69-5	No TRV		No TRV	
Captan	133-06-2	No TRV		No TRV	
Chlorobenzilate	510-15-6	No TRV		No TRV	
Dibutylphosphate	107-66-4	No TRV		No TRV	
Dimethyl aminoazobenzene	60-11-7	No TRV		No TRV	
Hexachlorobenzene	118-74-1	1.60E+03	EPA 1999[f]	2.25E+02	EPA 1999[f]
Hexachlorobutadiene	87-68-3	2.00E+02	EPA 1999[f]	3.19E+03	EPA 1999[f]
Hexachlorocyclopentadiene	77-47-4	3.80E+03	EPA 1999[f]	No TRV	
Hexachloroethane	67-72-1	1.00E+02	Gorzinski and others (1985) in IRIS (2002)[a]	No TRV	
Hexachlorophene	70-30-4	5.60E+03	EPA 1999[f]	5.75E+03	EPA 1999[f]
Hexamethylene-1,5-diisocyanate	822-06-0	No TRV		No TRV	
Mirex	2385-85-5	7.00E+01	NTP (1990) in IRIS (2002)[a]	No TRV	
Nitrofen	1836-75-5	No TRV		No TRV	
Pentachlorobenzene	608-93-5	7.25E+03	EPA 1999[f]	No TRV	
Pentachloronitrobenzene	82-68-8	4.58E+05	EPA 1999[f]	6.88E+04	EPA 1999[f]
Pentachlorophenol	87-86-5	3.00E+02	EPA 1999[f]	4.03E+03	EPA 1999[f]
Picric acid	88-89-1	No TRV		No TRV	
Pronamide	23950-58-5	7.50E+02	Rohm & Hass. Co (1970) in IRIS (2002)[a]	No TRV	
Strychnine	57-24-9	2.50E+01	Seidl and Zbinden (1982) in IRIS (2002)[a]	No TRV	
Terphenyls	26140-60-3	No TRV		No TRV	
Tributyl phosphate	126-73-8	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Great Basin Pocket Mouse		Western Meadowlark	
		NOAEL TRV	Source	NOAEL TRV	Source
2-sec-Butyl-4,6-dinitrophenol	88-85-7	No TRV		No TRV	
3,3'-Dichlorobenzidine	91-94-1	No TRV		No TRV	
3,3'-Dimethoxybenzidine	119-90-4	No TRV		No TRV	
4-Bromophenylphenyl ether	101-55-3	No TRV		No TRV	
Ammonium perfluorooctanoate	3825-26-1	No TRV		No TRV	
Azobenzene	103-33-3	No TRV		No TRV	
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)	96-69-5	No TRV		No TRV	
Captan	133-06-2	No TRV		No TRV	
Chlorobenzilate	510-15-6	No TRV		No TRV	
Dibutylphosphate	107-66-4	No TRV		No TRV	
Dimethyl aminoazobenzene	60-11-7	No TRV		No TRV	
Hexachlorobenzene	118-74-1	1.60E+03	EPA 1999[f]	2.25E+02	EPA 1999[f]
Hexachlorobutadiene	87-68-3	2.00E+02	EPA 1999[f]	3.19E+03	EPA 1999[f]
Hexachlorocyclopentadiene	77-47-4	3.80E+03	EPA 1999[f]	No TRV	
Hexachloroethane	67-72-1	1.00E+02	Gorzinski and others (1985) in IRIS (2002)[a]	No TRV	
Hexachlorophene	70-30-4	5.60E+03	EPA 1999[f]	5.75E+03	EPA 1999[f]
Hexamethylene-1,5-diisocyanate	822-06-0	No TRV		No TRV	
Mirex	2385-85-5	7.00E+01	NTP (1990) in IRIS (2002)[a]	No TRV	
Nitrofen	1836-75-5	No TRV		No TRV	
Pentachlorobenzene	608-93-5	7.25E+03	EPA 1999[f]	No TRV	
Pentachloronitrobenzene	82-68-8	4.58E+05	EPA 1999[f]	6.88E+04	EPA 1999[f]
Pentachlorophenol	87-86-5	3.00E+02	EPA 1999[f]	4.03E+03	EPA 1999[f]
Picric acid	88-89-1	No TRV		No TRV	
Pronamide	23950-58-5	7.50E+02	Rohm & Hass. Co (1970) in IRIS (2002)[a]	No TRV	
Strychnine	57-24-9	2.50E+01	Seidl and Zbinden (1982) in IRIS (2002)[a]	No TRV	
Terphenyls	26140-60-3	No TRV		No TRV	
Tributyl phosphate	126-73-8	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Coyote		Burrowing Owl	
		NOAEL TRV	Source	NOAEL TRV	Source
2-sec-Butyl-4,6-dinitrophenol	88-85-7	No TRV		No TRV	
3,3'-Dichlorobenzidine	91-94-1	No TRV		No TRV	
3,3'-Dimethoxybenzidine	119-90-4	No TRV		No TRV	
4-Bromophenylphenyl ether	101-55-3	No TRV		No TRV	
Ammonium perfluorooctanoate	3825-26-1	No TRV		No TRV	
Azobenzene	103-33-3	No TRV		No TRV	
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)	96-69-5	No TRV		No TRV	
Captan	133-06-2	No TRV		No TRV	
Chlorobenzilate	510-15-6	No TRV		No TRV	
Dibutylphosphate	107-66-4	No TRV		No TRV	
Dimethyl aminoazobenzene	60-11-7	No TRV		No TRV	
Hexachlorobenzene	118-74-1	1.60E+03	EPA 1999[f]	2.25E+02	EPA 1999[f]
Hexachlorobutadiene	87-68-3	2.00E+02	EPA 1999[f]	3.19E+03	EPA 1999[f]
Hexachlorocyclopentadiene	77-47-4	3.80E+03	EPA 1999[f]	No TRV	
Hexachloroethane	67-72-1	1.00E+02	Gorzinski and others (1985) in IRIS (2002)[a]	No TRV	
Hexachlorophene	70-30-4	5.60E+03	EPA 1999[f]	5.75E+03	EPA 1999[f]
Hexamethylene-1,5-diisocyanate	822-06-0	No TRV		No TRV	
Mirex	2385-85-5	7.00E+01	NTP (1990) in IRIS (2002)[a]	No TRV	
Nitrofen	1836-75-5	No TRV		No TRV	
Pentachlorobenzene	608-93-5	7.25E+03	EPA 1999[f]	No TRV	
Pentachloronitrobenzene	82-68-8	4.58E+05	EPA 1999[f]	6.88E+04	EPA 1999[f]
Pentachlorophenol	87-86-5	3.00E+02	EPA 1999[f]	4.03E+03	EPA 1999[f]
Picric acid	88-89-1	No TRV		No TRV	
Pronamide	23950-58-5	7.50E+02	Rohm & Hass. Co (1970) in IRIS (2002)[a]	No TRV	
Strychnine	57-24-9	2.50E+01	Seidl and Zbinden (1982) in IRIS (2002)[a]	No TRV	
Terphenyls	26140-60-3	No TRV		No TRV	
Tributyl phosphate	126-73-8	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures		Ingestion, Aquatic Exposures	
		Red-tailed Hawk		Canada Goose	
		NOAEL TRV	Source	NOAEL TRV	Source
2-sec-Butyl-4,6-dinitrophenol	88-85-7	No TRV		No TRV	
3,3'-Dichlorobenzidine	91-94-1	No TRV		No TRV	
3,3'-Dimethoxybenzidine	119-90-4	No TRV		No TRV	
4-Bromophenylphenyl ether	101-55-3	No TRV		No TRV	
Ammonium perfluorooctanoate	3825-26-1	No TRV		No TRV	
Azobenzene	103-33-3	No TRV		No TRV	
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)s	96-69-5	No TRV		No TRV	
Captan	133-06-2	No TRV		No TRV	
Chlorobenzilate	510-15-6	No TRV		No TRV	
Dibutylphosphate	107-66-4	No TRV		No TRV	
Dimethyl aminoazobenzene	60-11-7	No TRV		No TRV	
Hexachlorobenzene	118-74-1	2.25E+02	EPA 1999[f]	2.25E+02	EPA 1999[f]
Hexachlorobutadiene	87-68-3	3.19E+03	EPA 1999[f]	3.19E+03	EPA 1999[f]
Hexachlorocyclopentadiene	77-47-4	No TRV		No TRV	
Hexachloroethane	67-72-1	No TRV		No TRV	
Hexachlorophene	70-30-4	5.75E+03	EPA 1999[f]	5.75E+03	EPA 1999[f]
Hexamethylene-1,5-diisocyanate	822-06-0	No TRV		No TRV	
Mirex	2385-85-5	No TRV		No TRV	
Nitrofen	1836-75-5	No TRV		No TRV	
Pentachlorobenzene	608-93-5	No TRV		No TRV	
Pentachloronitrobenzene	82-68-8	6.88E+04	EPA 1999[f]	6.88E+04	EPA 1999[f]
Pentachlorophenol	87-86-5	4.03E+03	EPA 1999[f]	4.03E+03	EPA 1999[f]
Picric acid	88-89-1	No TRV		No TRV	
Pronamide	23950-58-5	No TRV		No TRV	
Strychnine	57-24-9	No TRV		No TRV	
Terphenyls	26140-60-3	No TRV		No TRV	
Tributyl phosphate	126-73-8	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Spotted Sandpiper		Great Blue Heron	
		NOAEL TRV	Source	NOAEL TRV	Source
2-sec-Butyl-4,6-dinitrophenol	88-85-7	No TRV		No TRV	
3,3'-Dichlorobenzidine	91-94-1	No TRV		No TRV	
3,3'-Dimethoxybenzidine	119-90-4	No TRV		No TRV	
4-Bromophenylphenyl ether	101-55-3	No TRV		No TRV	
Ammonium perfluorooctanoate	3825-26-1	No TRV		No TRV	
Azobenzene	103-33-3	No TRV		No TRV	
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)s	96-69-5	No TRV		No TRV	
Captan	133-06-2	No TRV		No TRV	
Chlorobenzilate	510-15-6	No TRV		No TRV	
Dibutylphosphate	107-66-4	No TRV		No TRV	
Dimethyl aminoazobenzene	60-11-7	No TRV		No TRV	
Hexachlorobenzene	118-74-1	2.25E+02	EPA 1999[f]	2.25E+02	EPA 1999[f]
Hexachlorobutadiene	87-68-3	3.19E+03	EPA 1999[f]	3.19E+03	EPA 1999[f]
Hexachlorocyclopentadiene	77-47-4	No TRV		No TRV	
Hexachloroethane	67-72-1	No TRV		No TRV	
Hexachlorophene	70-30-4	5.75E+03	EPA 1999[f]	5.75E+03	EPA 1999[f]
Hexamethylene-1,5-diisocyanate	822-06-0	No TRV		No TRV	
Mirex	2385-85-5	No TRV		No TRV	
Nitrofen	1836-75-5	No TRV		No TRV	
Pentachlorobenzene	608-93-5	No TRV		No TRV	
Pentachloronitrobenzene	82-68-8	6.88E+04	EPA 1999[f]	6.88E+04	EPA 1999[f]
Pentachlorophenol	87-86-5	4.03E+03	EPA 1999[f]	4.03E+03	EPA 1999[f]
Picric acid	88-89-1	No TRV		No TRV	
Pronamide	23950-58-5	No TRV		No TRV	
Strychnine	57-24-9	No TRV		No TRV	
Terphenyls	26140-60-3	No TRV		No TRV	
Tributyl phosphate	126-73-8	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Bald Eagle		Mink	
		NOAEL TRV	Source	NOAEL TRV	Source
2-sec-Butyl-4,6-dinitrophenol	88-85-7	No TRV		No TRV	
3,3'-Dichlorobenzidine	91-94-1	No TRV		No TRV	
3,3'-Dimethoxybenzidine	119-90-4	No TRV		No TRV	
4-Bromophenylphenyl ether	101-55-3	No TRV		No TRV	
Ammonium perfluorooctanoate	3825-26-1	No TRV		No TRV	
Azobenzene	103-33-3	No TRV		No TRV	
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)s	96-69-5	No TRV		No TRV	
Captan	133-06-2	No TRV		No TRV	
Chlorobenzilate	510-15-6	No TRV		No TRV	
Dibutylphosphate	107-66-4	No TRV		No TRV	
Dimethyl aminoazobenzene	60-11-7	No TRV		No TRV	
Hexachlorobenzene	118-74-1	2.25E+02	EPA 1999[f]	1.60E+03	EPA 1999[f]
Hexachlorobutadiene	87-68-3	3.19E+03	EPA 1999[f]	2.00E+02	EPA 1999[f]
Hexachlorocyclopentadiene	77-47-4	No TRV		3.80E+03	EPA 1999[f]
Hexachloroethane	67-72-1	No TRV		1.00E+02	Gorzinski and others (1985) in IRIS (2002)[a]
Hexachlorophene	70-30-4	5.75E+03	EPA 1999[f]	5.60E+03	EPA 1999[f]
Hexamethylene-1,5-diisocyanate	822-06-0	No TRV		No TRV	
Mirex	2385-85-5	No TRV		7.00E+01	NTP (1990) in IRIS (2002)[a]
Nitrofen	1836-75-5	No TRV		No TRV	
Pentachlorobenzene	608-93-5	No TRV		7.25E+03	EPA 1999[f]
Pentachloronitrobenzene	82-68-8	6.88E+04	EPA 1999[f]	4.58E+05	EPA 1999[f]
Pentachlorophenol	87-86-5	4.03E+03	EPA 1999[f]	3.00E+02	EPA 1999[f]
Picric acid	88-89-1	No TRV		No TRV	
Pronamide	23950-58-5	No TRV		7.50E+02	Rohm & Hass. Co (1970) in IRIS (2002)[a]
Strychnine	57-24-9	No TRV		2.50E+01	Seidl and Zbinden (1982) in IRIS (2002)[a]
Terphenyls	26140-60-3	No TRV		No TRV	
Tributyl phosphate	126-73-8	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors			
		Aquatic Biota		Chinook Salmon and Other Salmonids	
		NOAEL TRV	Source	NOAEL TRV	Source
2-sec-Butyl-4,6-dinitrophenol	88-85-7	No TRV		1.30E-02	Chronic LOAEL for fathead minnow (Suter and Tsao 1996[d] Table C-1) × 0.1 for LOAEL-to-NOAEL conversion
3,3'-Dichlorobenzidine	91-94-1	No TRV		No TRV	
3,3'-Dimethoxybenzidine	119-90-4	No TRV		No TRV	
4-Bromophenylphenyl ether	101-55-3	1.50E+00	Tier II Chronic (Suter & Tsao 1996)[d]	1.50E+00	Tier II Chronic (Suter & Tsao 1996)[d]
Ammonium perfluorooctanoate	3825-26-1	No TRV		No TRV	
Azobenzene	103-33-3	No TRV		No TRV	
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)s	96-69-5	No TRV		No TRV	
Captan	133-06-2	No TRV		No TRV	
Chlorobenzilate	510-15-6	No TRV		No TRV	
Dibutylphosphate	107-66-4	No TRV		No TRV	
Dimethyl aminoazobenzene	60-11-7	No TRV		No TRV	
Hexachlorobenzene	118-74-1	3.68E+00	EPA 1999[f]	3.68E+00	EPA 1999[f]
Hexachlorobutadiene	87-68-3	9.30E-01	EPA 1999[f]	9.30E-01	EPA 1999[f]
Hexachlorocyclopentadiene	77-47-4	5.20E-01	EPA 1999[f]	5.20E-01	EPA 1999[f]
Hexachloroethane	67-72-1	1.20E+01	Tier II Chronic (Suter & Tsao 1996)[d]	1.20E+01	Tier II Chronic (Suter & Tsao 1996)[d]
Hexachlorophene	70-30-4	8.80E-01	EPA 1999[f]	8.80E-01	EPA 1999[f]
Hexamethylene-1,5-diisocyanate	822-06-0	No TRV		No TRV	
Mirex	2385-85-5	1.00E-03	EPA 1987[b]	1.00E-03	EPA 1987[b]
Nitrofen	1836-75-5	No TRV		No TRV	
Pentachlorobenzene	608-93-5	4.70E-01	EPA 1999[f]	4.70E-01	EPA 1999[f]
Pentachloronitrobenzene	82-68-8	1.00E+01	EPA 1999[f]	1.00E+01	EPA 1999[f]
Pentachlorophenol	87-86-5	1.50E+01	EPA 1999[f]	5.59E-02	Pentachlorophenol LC_{50} from AQUIRE[g], CV calculated by Eq. 2 in Suter and Tsao (1996), Sect. 2.5
Picric acid	88-89-1	No TRV		No TRV	
Pronamide	23950-58-5	No TRV		No TRV	
Strychnine	57-24-9	No TRV		No TRV	
Terphenyls	26140-60-3	No TRV		No TRV	
Tributyl phosphate	126-73-8	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors	
		Benthic Organisms	
		NOAEL TRV	Source
2-sec-Butyl-4,6-dinitrophenol	88-85-7	No TRV	
3,3'-Dichlorobenzidine	91-94-1	No TRV	
3,3'-Dimethoxybenzidine	119-90-4	No TRV	
4-Bromophenylphenyl ether	101-55-3	No TRV	
Ammonium perfluorooctanoate	3825-26-1	No TRV	
Azobenzene	103-33-3	No TRV	
Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl)	96-69-5	No TRV	
Captan	133-06-2	No TRV	
Chlorobenzilate	510-15-6	No TRV	
Dibutylphosphate	107-66-4	No TRV	
Dimethyl aminoazobenzene	60-11-7	No TRV	
Hexachlorobenzene	118-74-1	2.00E+01	EPA 1999[f]
Hexachlorobutadiene	87-68-3	2.58E+02	EPA 1999[f]
Hexachlorocyclopentadiene	77-47-4	1.98E+02	EPA 1999[f]
Hexachloroethane	67-72-1	8.74E+02	EqP method (Jones and others 1997)[i]
Hexachlorophene	70-30-4	6.34E+04	EPA 1999[f]
Hexamethylene-1,5-diisocyanate	822-06-0	No TRV	
Mirex	2385-85-5	7.00E+00	Persaud and others (1993)[k]
Nitrofen	1836-75-5	No TRV	
Pentachlorobenzene	608-93-5	6.04E+02	EPA 1999[f]
Pentachloronitrobenzene	82-68-8	2.36E+03	EPA 1999[f]
Pentachlorophenol	87-86-5	7.00E+03	EPA 1999[f]
Picric acid	88-89-1	No TRV	
Pronamide	23950-58-5	No TRV	
Strychnine	57-24-9	No TRV	
Terphenyls	26140-60-3	No TRV	
Tributyl phosphate	126-73-8	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Exposure, Terrestrial Receptors			
		Plant		Terrestrial Invertebrate	
		TRV	Source	TRV	Source
Trifluralin	1582-09-8	No TRV		No TRV	
Triphenylamine	603-34-9	No TRV		No TRV	
Herbicides and Organochlorinated Pesticides					
2,4,5-T	93-76-5	No TRV		No TRV	
2,4-D and esters	94-75-7	No TRV		No TRV	
4,4'-DDD	72-54-8	No TRV		No TRV	
4,4'-DDE	72-55-9	No TRV		No TRV	
4,4'-DDT	50-29-3	No TRV		No TRV	
Aldrin	309-00-2	No TRV		No TRV	
alpha-BHC	319-84-6	No TRV		No TRV	
beta-BHC	319-85-7	No TRV		No TRV	
Chlordane	57-74-9	No TRV		No TRV	
Delta-BHC	319-86-8	No TRV		No TRV	
Dieldrin	60-57-1	No TRV		No TRV	
Endothall	145-73-3	No TRV		No TRV	
Endrin	72-20-8	No TRV		No TRV	
gamma-BHC (Lindane)	58-89-9	No TRV		No TRV	
Heptachlor	76-44-8	1.00E+03	EPA 1999[f]	No TRV	
Isodrin	465-73-6	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Mule Deer		Mourning Dove	
		NOAEL TRV	Source	NOAEL TRV	Source
Trifluralin	1582-09-8	7.50E+01	Hoechst Aktiengesellschaft (1984) in IRIS (2002)[a]	No TRV	
Triphenylamine	603-34-9	No TRV		No TRV	
Herbicides and Organochlorinated Pesticides					
2,4,5-T	93-76-5	3.00E+03	Smith and others (1981) in IRIS (2002)[a]	No TRV	
2,4-D and esters	94-75-7	No TRV		No TRV	
4,4'-DDD	72-54-8	No TRV		No TRV	
4,4'-DDE	72-55-9	1.00E+03	EPA 1999[f]	8.45E+02	EPA 1999[f]
4,4'-DDT	50-29-3	8.00E+02	Fitzhugh (1948) in Sample and others (1996)c	2.80E+00	Anderson and others (1975) in Sample and others (1996)[c]
Aldrin	309-00-2	2.00E+02	Treon and Cleveland (1955) in Sample and others (1996)[c]	No TRV	
alpha-BHC	319-84-6	No TRV		No TRV	
beta-BHC	319-85-7	4.00E-01	Van Velsen and others (1986) in Sample and others (1996)	No TRV	
Chlordane	57-74-9	4.58E+03	Keplinger and others (1968) in Sample and others (1996)c	2.14E+03	Stickel and others (1983) in Sample and others (1996)[c]
Delta-BHC	319-86-8	No TRV		No TRV	
Dieldrin	60-57-1	2.00E+01	Treon and Cleveland (1955) in Sample and others (1996)c	7.70E+01	Mendenhall and others (1983) in Sample and others (1996)[c]
Endothall	145-73-3	2.00E+03	Pennwalt Agchem (1965) in IRIS (2002)[a]	No TRV	
Endrin	72-20-8	9.20E+01	Good and Ware (1969) in Sample and others (1996)[c]	3.00E+02	Spann and others (1986) in Sample and others (1996)c
gamma-BHC (Lindane)	58-89-9	8.00E+03	Palmer and others (1978) in Sample and others (1996)[c]	2.00E+03	Chakravarty and Lahiri (1986) in Sample and others (1996)[c]
Heptachlor	76-44-8	2.50E+00	EPA 1999[f]	6.50E+01	EPA 1999[f]
Isodrin	465-73-6	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Great Basin Pocket Mouse		Western Meadowlark	
		NOAEL TRV	Source	NOAEL TRV	Source
Trifluralin	1582-09-8	7.50E+01	Hoechst Aktiengesellschaft (1984) in IRIS (2002)[a]	No TRV	
Triphenylamine	603-34-9	No TRV		No TRV	
Herbicides and Organochlorinated Pesticides					
2,4,5-T	93-76-5	3.00E+03	Smith and others (1981) in IRIS (2002)[a]	No TRV	
2,4-D and esters	94-75-7	No TRV		No TRV	
4,4'-DDD	72-54-8	No TRV		No TRV	
4,4'-DDE	72-55-9	1.00E+03	EPA 1999[f]	8.45E+02	EPA 1999[f]
4,4'-DDT	50-29-3	8.00E+02	Fitzhugh (1948) in Sample and others (1996)[c]	2.80E+00	Anderson and others (1975) in Sample and others (1996)[c]
Aldrin	309-00-2	2.00E+02	Treon and Cleveland (1955) in Sample and others (1996)[c]	No TRV	
alpha-BHC	319-84-6	No TRV		No TRV	
beta-BHC	319-85-7	4.00E-01	Van Velsen and others (1986) in Sample and others (1996)	No TRV	
Chlordane	57-74-9	4.58E+03	Keplinger and others (1968) in Sample and others (1996)[c]	2.14E+03	Stickel and others (1983) in Sample and others (1996)[c]
Delta-BHC	319-86-8	No TRV		No TRV	
Dieldrin	60-57-1	2.00E+01	Treon and Cleveland (1955) in Sample and others (1996)[c]	7.70E+01	Mendenhall and others (1983) in Sample and others (1996)[c]
Endothall	145-73-3	2.00E+03	Pennwalt Agchem (1965) in IRIS (2002)[a]	No TRV	
Endrin	72-20-8	9.20E+01	Good and Ware (1969) in Sample and others (1996)[c]	3.00E+02	Spann and others (1986) in Sample and others (1996)[c]
gamma-BHC (Lindane)	58-89-9	8.00E+03	Palmer and others (1978) in Sample and others (1996)[c]	2.00E+03	Chakravarty and Lahiri (1986) in Sample and others (1996)[c]
Heptachlor	76-44-8	2.50E+00	EPA 1999[f]	6.50E+01	EPA 1999[f]
Isodrin	465-73-6	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Coyote		Burrowing Owl	
		NOAEL TRV	Source	NOAEL TRV	Source
Trifluralin	1582-09-8	7.50E+01	Hoechst Aktiengesellschaft (1984) in IRIS (2002)[a]	No TRV	
Triphenylamine	603-34-9	No TRV		No TRV	
Herbicides and Organochlorinated Pesticides					
2,4,5-T	93-76-5	3.00E+03	Smith and others (1981) in IRIS (2002)[a]	No TRV	
2,4-D and esters	94-75-7	No TRV		No TRV	
4,4'-DDD	72-54-8	No TRV		No TRV	
4,4'-DDE	72-55-9	1.00E+03	EPA 1999[f]	8.45E+02	EPA 1999[f]
4,4'-DDT	50-29-3	8.00E+02	Fitzhugh (1948) in Sample and others (1996)[c]	2.80E+00	Anderson and others (1975) in Sample and others (1996)[c]
Aldrin	309-00-2	2.00E+02	Treon and Cleveland (1955) in Sample and others (1996)[c]	No TRV	
alpha-BHC	319-84-6	No TRV		No TRV	
beta-BHC	319-85-7	4.00E-01	Van Velsen and others (1986) in Sample and others (1996)	No TRV	
Chlordane	57-74-9	4.58E+03	Keplinger and others (1968) in Sample and others (1996)[c]	2.14E+03	Stickel and others (1983) in Sample and others (1996)[c]
Delta-BHC	319-86-8	No TRV		No TRV	
Dieldrin	60-57-1	2.00E+01	Treon and Cleveland (1955) in Sample and others (1996)[c]	7.70E+01	Mendenhall and others (1983) in Sample and others (1996)[c]
Endothall	145-73-3	2.00E+03	Pennwalt Agchem (1965) in IRIS (2002)[a]	No TRV	
Endrin	72-20-8	9.20E+01	Good and Ware (1969) in Sample and others (1996)[c]	3.00E+02	Spann and others (1986) in Sample and others (1996)[c]
gamma-BHC (Lindane)	58-89-9	8.00E+03	Palmer and others (1978) in Sample and others (1996)[c]	2.00E+03	Chakravarty and Lahiri (1986) in Sample and others (1996)[c]
Heptachlor	76-44-8	2.50E+00	EPA 1999[f]	6.50E+01	EPA 1999[f]
Isodrin	465-73-6	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures		Ingestion, Aquatic Exposures	
		Red-tailed Hawk		Canada Goose	
		NOAEL TRV	Source	NOAEL TRV	Source
Trifluralin	1582-09-8	No TRV		No TRV	
Triphenylamine	603-34-9	No TRV		No TRV	
Herbicides and Organochlorinated Pesticides					
2,4,5-T	93-76-5	No TRV		No TRV	
2,4-D and esters	94-75-7	No TRV		No TRV	
4,4'-DDD	72-54-8	No TRV		No TRV	
4,4'-DDE	72-55-9	8.45E+02	EPA 1999[f]	8.45E+02	EPA 1999[f]
4,4'-DDT	50-29-3	2.80E+00	Anderson and others (1975) in Sample and others (1996)[c]	2.80E+00	Anderson and others (1975) in Sample and others (1996)[c]
Aldrin	309-00-2	No TRV		No TRV	
alpha-BHC	319-84-6	No TRV		No TRV	
beta-BHC	319-85-7	No TRV		No TRV	
Chlordane	57-74-9	2.14E+03	Stickel and others (1983) in Sample and others (1996)[c]	2.14E+03	Stickel and others (1983) in Sample and others (1996)[c]
Delta-BHC	319-86-8	No TRV		No TRV	
Dieldrin	60-57-1	7.70E+01	Mendenhall and others (1983) in Sample and others (1996)[c]	7.70E+01	Mendenhall and others (1983) in Sample and others (1996)[c]
Endothall	145-73-3	No TRV		No TRV	
Endrin	72-20-8	3.00E+02	Spann and others (1986) in Sample and others (1996)[c]	3.00E+02	Spann and others (1986) in Sample and others (1996)[c]
gamma-BHC (Lindane)	58-89-9	2.00E+03	Chakravarty and Lahiri (1986) in Sample and others (1996)[c]	2.00E+03	Chakravarty and Lahiri (1986) in Sample and others (1996)[c]
Heptachlor	76-44-8	6.50E+01	EPA 1999[f]	6.50E+01	EPA 1999[f]
Isodrin	465-73-6	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Spotted Sandpiper		Great Blue Heron	
		NOAEL TRV	Source	NOAEL TRV	Source
Trifluralin	1582-09-8	No TRV		No TRV	
Triphenylamine	603-34-9	No TRV		No TRV	
Herbicides and Organochlorinated Pesticides					
2,4,5-T	93-76-5	No TRV		No TRV	
2,4-D and esters	94-75-7	No TRV		No TRV	
4,4'-DDD	72-54-8	No TRV		No TRV	
4,4'-DDE	72-55-9	8.45E+02	EPA 1999[f]	8.45E+02	EPA 1999[f]
4,4'-DDT	50-29-3	2.80E+00	Anderson and others (1975) in Sample and others (1996)[c]	2.80E+00	Anderson and others (1975) in Sample and others (1996)[c]
Aldrin	309-00-2	No TRV		No TRV	
alpha-BHC	319-84-6	No TRV		No TRV	
beta-BHC	319-85-7	No TRV		No TRV	
Chlordane	57-74-9	2.14E+03	Stickel and others (1983) in Sample and others (1996)[c]	2.14E+03	Stickel and others (1983) in Sample and others (1996)[c]
Delta-BHC	319-86-8	No TRV		No TRV	
Dieldrin	60-57-1	7.70E+01	Mendenhall and others (1983) in Sample and others (1996)[c]	7.70E+01	Mendenhall and others (1983) in Sample and others (1996)[c]
Endothall	145-73-3	No TRV		No TRV	
Endrin	72-20-8	3.00E+02	Spann and others (1986) in Sample and others (1996)[c]	3.00E+02	Spann and others (1986) in Sample and others (1996)[c]
gamma-BHC (Lindane)	58-89-9	2.00E+03	Chakravarty and Lahiri (1986) in Sample and others (1996)[c]	2.00E+03	Chakravarty and Lahiri (1986) in Sample and others (1996)[c]
Heptachlor	76-44-8	6.50E+01	EPA 1999[f]	6.50E+01	EPA 1999[f]
Isodrin	465-73-6	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Bald Eagle		Mink	
		NOAEL TRV	Source	NOAEL TRV	Source
Trifluralin	1582-09-8	No TRV		7.50E+01	Hoechst Aktiengesellschaft (1984) in IRIS (2002)[a]
Triphenylamine	603-34-9	No TRV		No TRV	
Herbicides and Organochlorinated Pesticides					
2,4,5-T	93-76-5	No TRV		3.00E+03	Smith and others (1981) in IRIS (2002)[a]
2,4-D and esters	94-75-7	No TRV		No TRV	
4,4'-DDD	72-54-8	No TRV		No TRV	
4,4'-DDE	72-55-9	8.45E+02	EPA 1999[f]	1.00E+03	EPA 1999[f]
4,4'-DDT	50-29-3	2.80E+00	Anderson and others (1975) in Sample and others (1996)[c]	8.00E+02	Fitzhugh (1948) in Sample and others (1996)[c]
Aldrin	309-00-2	No TRV		2.00E+02	Treon and Cleveland (1955) in Sample and others (1996)[c]
alpha-BHC	319-84-6	No TRV		No TRV	
beta-BHC	319-85-7	No TRV		4.00E-01	Van Velsen and others (1986) in Sample and others (1996)
Chlordane	57-74-9	2.14E+03	Stickel and others (1983) in Sample and others (1996)[c]	4.58E+03	Keplinger and others (1968) in Sample and others (1996)[c]
Delta-BHC	319-86-8	No TRV		No TRV	
Dieldrin	60-57-1	7.70E+01	Mendenhall and others (1983) in Sample and others (1996)[c]	2.00E+01	Treon and Cleveland (1955) in Sample and others (1996)[c]
Endothall	145-73-3	No TRV		2.00E+03	Pennwalt Agchem (1965) in IRIS (2002)[a]
Endrin	72-20-8	3.00E+02	Spann and others (1986) in Sample and others (1996)[c]	9.20E+01	Good and Ware (1969) in Sample and others (1996)[c]
gamma-BHC (Lindane)	58-89-9	2.00E+03	Chakravarty and Lahiri (1986) in Sample and others (1996)[c]	8.00E+03	Palmer and others (1978) in Sample and others (1996)[c]
Heptachlor	76-44-8	6.50E+01	EPA 1999[f]	2.50E+00	EPA 1999[f]
Isodrin	465-73-6	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors			
		Aquatic Biota		Chinook Salmon and Other Salmonids	
		NOAEL TRV	Source	NOAEL TRV	Source
Trifluralin	1582-09-8	No TRV		No TRV	
Triphenylamine	603-34-9	No TRV		No TRV	
Herbicides and Organochlorinated Pesticides					
2,4,5-T	93-76-5	No TRV		No TRV	
2,4-D and esters	94-75-7	No TRV		No TRV	
4,4'-DDD	72-54-8	1.10E-02	Tier II Chronic (Suter & Tsao 1996)[d]	2.00E-04	Acute LOAEL for rainbow trout (Suter and Sao 1996[d] Table C-1) × 0.1 for LOAEL-to-NOAEL conversion × 0.1 for acute-to-chronic conversion
4,4'-DDE	72-55-9	1.05E+01	EPA 1999[f]	1.05E+01	EPA 1999[f]
4,4'-DDT	50-29-3	1.30E-02	Tier II Chronic (Suter & Tsao 1996)[d]	8.00E-03	Sensitive Species Test EC_{20} (Suter and Tsao 1996[d], Table 2)
Aldrin	309-00-2	3.00E+00	EPA 1987[b]	3.00E+00	EPA 1987[b]
alpha-BHC	319-84-6	2.20E+00	Tier II Chronic (Suter & Tsao 1996)[d]	2.20E+00	Tier II Chronic (Suter & Tsao 1996)[d]
beta-BHC	319-85-7	2.20E+00	Tier II Chronic (Suter & Tsao 1996)[d]	2.20E+00	Tier II Chronic (Suter & Tsao 1996)[d]
Chlordane	57-74-9	1.70E-01	NAWQC Chronic (Suter & Tsao 1996)[d]	2.00E-02	LOAEL for brook trout (Suter and Tsao 1996[d] Table C-1) × 0.1 for LOAEL-to-NOAEL conversion
Delta-BHC	319-86-8	2.20E+00	Tier II Chronic (Suter & Tsao 1996)[d]	2.20E+00	Tier II Chronic (Suter & Tsao 1996)[d]
Dieldrin	60-57-1	6.20E-02	NAWQC Chronic (Suter & Tsao 1996)[d]	6.20E-02	NAWQC Chronic (Suter & Tsao 1996)[d]
Endothall	145-73-3	No TRV		No TRV	
Endrin	72-20-8	6.10E-02	NAWQC Chronic (Suter & Tsao 1996)[d]	6.10E-02	NAWQC Chronic (Suter & Tsao 1996)[d]
gamma-BHC (Lindane)	58-89-9	8.00E-02	NAWQC Chronic (Suter & Tsao 1996)[d]	8.00E-02	NAWQC Chronic (Suter & Tsao 1996)[d]
Heptachlor	76-44-8	3.80E-03	EPA 1999[f]	3.80E-03	EPA 1999[f]
Isodrin	465-73-6	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors	
		Benthic Organisms	
		NOAEL TRV	Source
Trifluralin	1582-09-8	No TRV	
Triphenylamine	603-34-9	No TRV	
Herbicides and Organochlorinated Pesticides			
2,4,5-T	93-76-5	No TRV	
2,4-D and esters	94-75-7	No TRV	
4,4'-DDD	72-54-8	8.00E+00	Persaud and others (1993)[k]
4,4'-DDE	72-55-9	5.00E+00	EPA 1999[f]
4,4'-DDT	50-29-3	8.00E+00	Persaud and others (1993)[k]
Aldrin	309-00-2	2.00E+00	Persaud and others (1993)[k]
alpha-BHC	319-84-6	6.00E+00	Persaud and others (1993)[k]
beta-BHC	319-85-7	5.00E+00	Persaud and others (1993)[k]
Chlordane	57-74-9	7.00E+00	Persaud and others (1993)[k]
Delta-BHC	319-86-8	2.48E-01	EqP method (Jones and others 1997)[i]
Dieldrin	60-57-1	2.00E+00	Persaud and others (1993)[k]
Endothall	145-73-3	No TRV	Persaud and others (1993)[k]
Endrin	72-20-8	3.00E+00	Persaud and others (1993)[k]
gamma-BHC (Lindane)	58-89-9	3.00E+00	Persaud and others (1993)[k]
Heptachlor	76-44-8	3.08E-01	EPA 1999[f]
Isodrin	465-73-6	No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Exposure, Terrestrial Receptors			
		Plant		Terrestrial Invertebrate	
		TRV	Source	TRV	Source
Methoxychlor	72-43-5	No TRV		No TRV	
Silvex (2,4,5-TP)	93-72-1	No TRV		No TRV	
Toxaphene	8001-35-2	No TRV		No TRV	
Inorganic Chemicals and Compounds					
	Metals				
Aluminum	7429-90-5	5.00E+00	EPA 1999[f]	No TRV	
Antimony	7440-36-0	5.00E-01	EPA 1999[f]	No TRV	
Arsenic	7440-38-2	1.00E+00	EPA 1999[f]	2.50E-01	EPA 1999[f]
Barium	7440-39-3	5.00E+00	EPA 1999[f]	No TRV	
Beryllium	7440-41-7	1.00E-01	EPA 1999[f]	No TRV	
Bismuth	7440-69-9	No TRV		No TRV	
Boron	7440-42-8	5.00E-01	Efroymson and others (1997a)[e]	No TRV	
Cadmium	7440-43-9	2.00E-01	EPA 1999[f]	1.00E+01	EPA 1999[f]
Calcium	7440-70-2	No TRV		No TRV	
Chromium[1]	18540-29-9	1.80E-02	EPA 1999[f]	2.00E-01	EPA 1999[f]
Cobalt	7440-48-4	2.00E+01	Efroymson and others (1997a)[e]	No TRV	
Copper	7440-50-8	1.00E+00	EPA 1999[f]	3.20E+01	EPA 1999[f]
Iron	7439-89-6	No TRV		No TRV	
Lead	7439-92-1	4.60E+00	EPA 1999[f]	1.00E+02	EPA 1999[f]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Mule Deer		Mourning Dove	
		NOAEL TRV	Source	NOAEL TRV	Source
Methoxychlor	72-43-5	5.01E+03	Kincaid Enterprises (1986) in IRIS (2002)[a]	No TRV	
Silvex (2,4,5-TP)	93-72-1	7.50E+02	Mullison (1966), Gehring and Betso (1978) in IRIS (2002)[a]	No TRV	
Toxaphene	8001-35-2	8.00E+03	Kennedy and others (1973) in Sample and others (1996)[c]	No TRV	
Inorganic Chemicals and Compounds		(mg/kgBW/d)			
	Metals				
Aluminum	7429-90-5	1.93E+00	EPA 1999[f]	1.00E+02	EPA 1999[f]
Antimony	7440-36-0	6.60E-02	EPA 1999[f]	No TRV	
Arsenic	7440-38-2	1.25E+00	EPA 1999[f]	2.46E+00	EPA 1999[f]
Barium	7440-39-3	5.10E-01	EPA 1999[f]	2.08E+01	EPA 1999[f]
Beryllium	7440-41-7	6.60E-01	EPA 1999[f]	No TRV	
Bismuth	7440-69-9	No TRV		No TRV	
Boron	7440-42-8	2.80E+01	Weir and Fisher (1972) in Sample and others (1996)[c]	2.88E+01	Smith and Anders (1989) in Sample and others (1996)[c]
Cadmium	7440-43-9	2.52E-02	EPA 1999[f]	1.45E+00	EPA 1999[f]
Calcium	7440-70-2	No TRV		No TRV	
Chromium[l]	18540-29-9	3.50E+00	EPA 1999[f]	1.00E+00	EPA 1999[f]
Cobalt	7440-48-4	2.86E-01	Underhill and others (1931) in Clayton and Clayton (1981)[m]	No TRV	
Copper	7440-50-8	1.20E+01	EPA 1999[f]	4.70E+01	EPA 1999[f]
Iron	7439-89-6	No TRV		No TRV	
Lead	7439-92-1	3.75E-02	EPA 1999[f]	2.50E-02	EPA 1999[f]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Great Basin Pocket Mouse		Western Meadowlark	
		NOAEL TRV	Source	NOAEL TRV	Source
Methoxychlor	72-43-5	5.01E+03	Kincaid Enterprises (1986) in IRIS (2002)[a]	No TRV	
Silvex (2,4,5-TP)	93-72-1	7.50E+02	Mullison (1966), Gehring and Betso (1978) in IRIS (2002)[a]	No TRV	
Toxaphene	8001-35-2	8.00E+03	Kennedy and others (1973) in Sample and others (1996)[c]	No TRV	
Inorganic Chemicals and Compounds		(mg/kgBW/d)			
	Metals				
Aluminum	7429-90-5	1.93E+00	EPA 1999[f]	1.00E+02	EPA 1999[f]
Antimony	7440-36-0	6.60E-02	EPA 1999[f]	No TRV	
Arsenic	7440-38-2	1.25E+00	EPA 1999[f]	2.46E+00	EPA 1999[f]
Barium	7440-39-3	5.10E-01	EPA 1999[f]	2.08E+01	EPA 1999[f]
Beryllium	7440-41-7	6.60E-01	EPA 1999[f]	No TRV	
Bismuth	7440-69-9	No TRV		No TRV	
Boron	7440-42-8	2.80E+01	Weir and Fisher (1972) in Sample and others (1996)[c]	2.88E+01	Smith and Anders (1989) in Sample and others (1996)[c]
Cadmium	7440-43-9	2.52E-02	EPA 1999[f]	1.45E+00	EPA 1999[f]
Calcium	7440-70-2	No TRV		No TRV	
Chromium[l]	18540-29-9	3.50E+00	EPA 1999[f]	1.00E+00	EPA 1999[f]
Cobalt	7440-48-4	2.86E-01	Underhill and others (1931) in Clayton and Clayton (1981)[m]	No TRV	
Copper	7440-50-8	1.20E+01	EPA 1999[f]	4.70E+01	EPA 1999[f]
Iron	7439-89-6	No TRV		No TRV	
Lead	7439-92-1	3.75E-02	EPA 1999[f]	2.50E-02	EPA 1999[f]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Coyote		Burrowing Owl	
		NOAEL TRV	Source	NOAEL TRV	Source
Methoxychlor	72-43-5	5.01E+03	Kincaid Enterprises (1986) in IRIS (2002)[a]	No TRV	
Silvex (2,4,5-TP)	93-72-1	7.50E+02	Mullison (1966), Gehring and Betso (1978) in IRIS (2002)[a]	No TRV	
Toxaphene	8001-35-2	8.00E+03	Kennedy and others (1973) in Sample and others (1996)[c]	No TRV	
Inorganic Chemicals and Compounds		(mg/kgBW/d)			
	Metals				
Aluminum	7429-90-5	1.93E+00	EPA 1999[f]	1.00E+02	EPA 1999[f]
Antimony	7440-36-0	6.60E-02	EPA 1999[f]	No TRV	
Arsenic	7440-38-2	1.25E+00	EPA 1999[f]	2.46E+00	EPA 1999[f]
Barium	7440-39-3	5.10E-01	EPA 1999[f]	2.08E+01	EPA 1999[f]
Beryllium	7440-41-7	6.60E-01	EPA 1999[f]	No TRV	
Bismuth	7440-69-9	No TRV		No TRV	
Boron	7440-42-8	2.80E+01	Weir and Fisher (1972) in Sample and others (1996)[c]	2.88E+01	Smith and Anders (1989) in Sample and others (1996)[c]
Cadmium	7440-43-9	2.52E-02	EPA 1999[f]	1.45E+00	EPA 1999[f]
Calcium	7440-70-2	No TRV		No TRV	
Chromium[l]	18540-29-9	3.50E+00	EPA 1999[f]	1.00E+00	EPA 1999[f]
Cobalt	7440-48-4	2.86E-01	Underhill and others (1931) in Clayton and Clayton (1981)[m]	No TRV	
Copper	7440-50-8	1.20E+01	EPA 1999[f]	4.70E+01	EPA 1999[f]
Iron	7439-89-6	No TRV		No TRV	
Lead	7439-92-1	3.75E-02	EPA 1999[f]	2.50E-02	EPA 1999[f]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures		Ingestion, Aquatic Exposures	
		Red-tailed Hawk		Canada Goose	
		NOAEL TRV	Source	NOAEL TRV	Source
Methoxychlor	72-43-5	No TRV		No TRV	
Silvex (2,4,5-TP)	93-72-1	No TRV		No TRV	
Toxaphene	8001-35-2	No TRV		No TRV	
Inorganic Chemicals and Compounds					
Metals					
Aluminum	7429-90-5	1.00E+02	EPA 1999[f]	1.00E+02	EPA 1999[f]
Antimony	7440-36-0	No TRV		No TRV	
Arsenic	7440-38-2	2.46E+00	EPA 1999[f]	2.46E+00	EPA 1999[f]
Barium	7440-39-3	2.08E+01	EPA 1999[f]	2.08E+01	EPA 1999[f]
Beryllium	7440-41-7	No TRV		No TRV	
Bismuth	7440-69-9	No TRV		No TRV	
Boron	7440-42-8	2.88E+01	Smith and Anders (1989) in Sample and others (1996)[c]	2.88E+01	Smith and Anders (1989) in Sample and others (1996)[c]
Cadmium	7440-43-9	1.45E+00	EPA 1999[f]	1.45E+00	EPA 1999[f]
Calcium	7440-70-2	No TRV		No TRV	
Chromium[l]	18540-29-9	1.00E+00	EPA 1999[f]	1.00E+00	EPA 1999[f]
Cobalt	7440-48-4	No TRV		No TRV	
Copper	7440-50-8	4.70E+01	EPA 1999[f]	4.70E+01	EPA 1999[f]
Iron	7439-89-6	No TRV		No TRV	
Lead	7439-92-1	2.50E-02	EPA 1999[f]	2.50E-02	EPA 1999[f]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Spotted Sandpiper		Great Blue Heron	
		NOAEL TRV	Source	NOAEL TRV	Source
Methoxychlor	72-43-5	No TRV		No TRV	
Silvex (2,4,5-TP)	93-72-1	No TRV		No TRV	
Toxaphene	8001-35-2	No TRV		No TRV	
Inorganic Chemicals and Compounds					
Metals					
Aluminum	7429-90-5	1.00E+02	EPA 1999[f]	1.00E+02	EPA 1999[f]
Antimony	7440-36-0	No TRV		No TRV	
Arsenic	7440-38-2	2.46E+00	EPA 1999[f]	2.46E+00	EPA 1999[f]
Barium	7440-39-3	2.08E+01	EPA 1999[f]	2.08E+01	EPA 1999[f]
Beryllium	7440-41-7	No TRV		No TRV	
Bismuth	7440-69-9	No TRV		No TRV	
Boron	7440-42-8	2.88E+01	Smith and Anders (1989) in Sample and others (1996)[c]	2.88E+01	Smith and Anders (1989) in Sample and others (1996)[c]
Cadmium	7440-43-9	1.45E+00	EPA 1999[f]	1.45E+00	EPA 1999[f]
Calcium	7440-70-2	No TRV		No TRV	
Chromium[l]	18540-29-9	1.00E+00	EPA 1999[f]	1.00E+00	EPA 1999[f]
Cobalt	7440-48-4	No TRV		No TRV	
Copper	7440-50-8	4.70E+01	EPA 1999[f]	4.70E+01	EPA 1999[f]
Iron	7439-89-6	No TRV		No TRV	
Lead	7439-92-1	2.50E-02	EPA 1999[f]	2.50E-02	EPA 1999[f]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Bald Eagle		Mink	
		NOAEL TRV	Source	NOAEL TRV	Source
Methoxychlor	72-43-5	No TRV		5.01E+03	Kincaid Enterprises (1986) in IRIS (2002)[a]
Silvex (2,4,5-TP)	93-72-1	No TRV		7.50E+02	Mullison (1966), Gehring and Betso (1978) in IRIS (2002)[a]
Toxaphene	8001-35-2	No TRV		8.00E+03	Kennedy and others (1973) in Sample and others (1996)[c]
Inorganic Chemicals and Compounds				(mg/kgBW/d)	
		Metals			
Aluminum	7429-90-5	1.00E+02	EPA 1999[f]	1.93E+00	EPA 1999[f]
Antimony	7440-36-0	No TRV		6.60E-02	EPA 1999[f]
Arsenic	7440-38-2	2.46E+00	EPA 1999[f]	1.25E+00	EPA 1999[f]
Barium	7440-39-3	2.08E+01	EPA 1999[f]	5.10E-01	EPA 1999[f]
Beryllium	7440-41-7	No TRV		6.60E-01	EPA 1999[f]
Bismuth	7440-69-9	No TRV		No TRV	
Boron	7440-42-8	2.88E+01	Smith and Anders (1989) in Sample and others (1996)[c]	2.80E+01	Weir and Fisher (1972) in Sample and others (1996)[c]
Cadmium	7440-43-9	1.45E+00	EPA 1999[f]	2.52E-02	EPA 1999[f]
Calcium	7440-70-2	No TRV		No TRV	
Chromium[l]	18540-29-9	1.00E+00	EPA 1999[f]	3.50E+00	EPA 1999[f]
Cobalt	7440-48-4	No TRV		2.86E-01	Underhill and others (1931) in Clayton and Clayton (1981)[m]
Copper	7440-50-8	4.70E+01	EPA 1999[f]	1.20E+01	EPA 1999[f]
Iron	7439-89-6	No TRV		No TRV	
Lead	7439-92-1	2.50E-02	EPA 1999[f]	3.75E-02	EPA 1999[f]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors			
		Aquatic Biota		Chinook Salmon and Other Salmonids	
		NOAEL TRV	Source	NOAEL TRV	Source
Methoxychlor	72-43-5	1.90E-02	NAWQC Chronic (Suter & Tsao 1996)[d]	1.90E-02	NAWQC Chronic (Suter & Tsao 1996)[d]
Silvex (2,4,5-TP)	93-72-1	No TRV		No TRV	
Toxaphene	8001-35-2	1.75E+02	EPA 1987[b]	1.00E-03	Chronic LOAEL for brook trout (Suter and Tsao 1996[d] Table C-1) × 0.1 for LOAEL-to-NOAEL conversion
Inorganic Chemicals and Compounds		(mg/L)		(mg/L)	
	Metals				
Aluminum	7429-90-5	8.70E-02	EPA 1999[f]	7.50E-02	Sensitive Species Test EC_{20} (Suter and Tsao 1996[d], Table 2)
Antimony	7440-36-0	3.00E-02	EPA 1999[f]	3.00E-02	EPA 1999[f]
Arsenic	7440-38-2	1.50E-01	EPA 1999[f]	5.50E-02	Sensitive Species Test EC_{20} (Suter and Tsao 1996[d], Table 2)
Barium	7440-39-3	4.00E-03	Tier II Chronic (Suter & Tsao 1996)[d]	4.00E-03	Tier II Chronic (Suter & Tsao 1996)[d]
Beryllium	7440-41-7	6.60E-04	EPA 1999[f]	6.60E-04	EPA 1999[f]
Bismuth	7440-69-9	No TRV		No TRV	
Boron	7440-42-8	1.60E-03	Tier II Chronic (Suter & Tsao 1996)[d]	1.60E-03	Tier II Chronic (Suter & Tsao 1996)[d]
Cadmium	7440-43-9	2.20E-03	EPA 1999[f]	1.30E-05	Sensitive Species Test EC_{20} (Suter and Tsao 1996[d], Table 2)
Calcium	7440-70-2	No TRV		No TRV	
Chromium[l]	18540-29-9	1.10E-02	EPA 1999[f]	2.66E-04	Sensitive Species Test EC_{20} (Suter and Tsao 1996[d], Table 2)
Cobalt	7440-48-4	2.30E-02	Tier II Chronic (Suter & Tsao 1996)[d]	2.30E-02	Tier II Chronic (Suter & Tsao 1996)[d]
Copper	7440-50-8	9.00E-03	EPA 1999[f]	2.60E-04	Sensitive Species Test EC_{20} (Suter and Tsao 1996[d], Table 2)
Iron	7439-89-6	1.00E+00	NAWQC Chronic (Suter & Tsao 1996)[d]	1.00E+00	NAWQC Chronic (Suter & Tsao 1996)[d]
Lead	7439-92-1	2.50E-03	EPA 1999[f]	3.50E-04	Sensitive Species Test EC_{20} (Suter and Tsao 1996[d], Table 2)

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors	
		Benthic Organisms	
		NOAEL TRV	Source
Methoxychlor	72-43-5	6.08E+01	EqP method (Jones and others 1997)[i]
Silvex (2,4,5-TP)	93-72-1	No TRV	
Toxaphene	8001-35-2	3.50E+01	EqP method (Jones and others 1997)[i]
Inorganic Chemicals and Compounds		(mg/kg)	
	Metals		
Aluminum	7429-90-5	1.40E+04	EPA 1999[f]
Antimony	7440-36-0	6.40E+01	EPA 1999[f]
Arsenic	7440-38-2	6.00E+00	EPA 1999[f]
Barium	7440-39-3	2.00E+01	EPA 1999[f]
Beryllium	7440-41-7	No TRV	
Bismuth	7440-69-9	No TRV	
Boron	7440-42-8	No TRV	
Cadmium	7440-43-9	6.00E-01	EPA 1999[f]
Calcium	7440-70-2	No TRV	
Chromium[l]	18540-29-9	2.60E+01	EPA 1999[f]
Cobalt	7440-48-4	No TRV	
Copper	7440-50-8	1.60E+01	EPA 1999[f]
Iron	7439-89-6	2.00E+04	Persaud and others (1993)
Lead	7439-92-1	3.10E+01	EPA 1999[f]

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Exposure, Terrestrial Receptors			
		Plant		Terrestrial Invertebrate	
		TRV	Source	TRV	Source
Lithium	7439-93-2	2.00E+00	Efroymson and others (1997a)[e]	No TRV	
Magnesium	7439-95-4	No TRV		No TRV	
Manganese	7439-96-5	5.00E+02	Efroymson and others (1997a)[e]	No TRV	
Mercury	7439-97-6	No TRV		No TRV	
Mercury - Hg+2	7487-94-7	3.49E-01	EPA 1999[f]	2.50E+00	EPA 1999[f]
Methylmercury	22967-92-6	No TRV		2.50E+00	EPA 1999[f]
Molybdenum	7439-98-7	2.00E+00	Efroymson and others (1997a)[e]	No TRV	
Nickel	7440-02-0	2.50E+01	EPA 1999[f]	1.00E+02	EPA 1999[f]
Potassium	7440-09-7	No TRV		No TRV	
Rhodium	7440-16-6	No TRV		No TRV	
Selenium	7782-49-2	5.00E-02	EPA 1999[f]	7.70E+00	EPA 1999[f]
Silicon	7440-21-3	No TRV		No TRV	
Silver	7440-22-4	2.00E-02	EPA 1999[f]	No TRV	
Sodium	7440-23-5	No TRV		No TRV	
Strontium	7440-24-6	No TRV		No TRV	
Tantalum	7440-25-7	No TRV		No TRV	
Thallium	7440-28-0	1.00E-02	EPA 1999[f]	No TRV	
Tin	7440-31-5	5.00E+01	Efroymson and others (1997a)[e]	No TRV	
Tungsten	7440-33-7	No TRV		No TRV	
Uranium	7440-61-1	5.00E+00	Efroymson and others (1997a)[e]	No TRV	
Vanadium	7440-62-2	2.00E+00	Efroymson and others (1997a)[e]	No TRV	
Yttrium	7440-65-5	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Mule Deer		Mourning Dove	
		NOAEL TRV	Source	NOAEL TRV	Source
Lithium	7439-93-2	9.39E+00	Marathe and Thomas (1986) in Sample and others (1996)[e]	No TRV	
Magnesium	7439-95-4	No TRV		No TRV	
Manganese	7439-96-5	8.80E+01	Laskey and others (1982) in Sample and others (1996)[e]	9.77E+02	Laskey and Edens (1985) in Sample and others (1996)[e]
Mercury	7439-97-6	No TRV		No TRV	
Mercury - Hg+2	7487-94-7	1.01E+00	EPA 1999[f]	3.25E+00	EPA 1999[f]
Methylmercury	22967-92-6	3.20E-02	EPA 1999[f]	6.40E-03	EPA 1999[f]
Molybdenum	7439-98-7	2.58E-01	Schroeder and Mitchner (1971) in Sample and others (1996)[e]	3.53E+00	Lepore and Miller (1965) in Sample and others (1996)[e]
Nickel	7440-02-0	5.00E+01	EPA 1999[f]	6.50E+01	EPA 1999[f]
Potassium	7440-09-7	No TRV		No TRV	
Rhodium	7440-16-6	No TRV		No TRV	
Selenium	7782-49-2	7.60E-02	EPA 1999[f]	5.00E-01	EPA 1999[f]
Silicon	7440-21-3	No TRV		No TRV	
Silver	7440-22-4	3.75E-01	EPA 1999[f]	1.78E+02	EPA 1999[f]
Sodium	7440-23-5	No TRV		No TRV	
Strontium	7440-24-6	2.63E+02	Skoryna (1981) in Sample and others (1996)	No TRV	
Tantalum	7440-25-7	No TRV		No TRV	
Thallium	7440-28-0	1.31E-02	EPA 1999[f]	3.50E-01	EPA 1999[f]
Tin	7440-31-5	No TRV		No TRV	
Tungsten	7440-33-7	No TRV		No TRV	
Uranium	7440-61-1	3.07E+00	Paternain and others (1989) in Sample and others (1996)[e]	1.60E+01	Haseltine and Sileo (1983) in Sample and others (1996)[e]
Vanadium	7440-62-2	2.10E-01	Domingo and others (1986) in Sample and others (1996)[e]	1.14E+01	White and Dieter (1978) in Sample and others (1996)[e]
Yttrium	7440-65-5	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Great Basin Pocket Mouse		Western Meadowlark	
		NOAEL TRV	Source	NOAEL TRV	Source
Lithium	7439-93-2	9.39E+00	Marathe and Thomas (1986) in Sample and others (1996)[c]	No TRV	
Magnesium	7439-95-4	No TRV		No TRV	
Manganese	7439-96-5	8.80E+01	Laskey and others (1982) in Sample and others (1996)[c]	9.77E+02	Laskey and Edens (1985) in Sample and others (1996)[c]
Mercury	7439-97-6	No TRV		No TRV	
Mercury - Hg+2	7487-94-7	1.01E+00	EPA 1999[f]	3.25E+00	EPA 1999[f]
Methylmercury	22967-92-6	3.20E-02	EPA 1999[f]	6.40E-03	EPA 1999[f]
Molybdenum	7439-98-7	2.58E-01	Schroeder and Mitchner (1971) in Sample and others (1996)[c]	3.53E+00	Lepore and Miller (1965) in Sample and others (1996)[c]
Nickel	7440-02-0	5.00E+01	EPA 1999[f]	6.50E+01	EPA 1999[f]
Potassium	7440-09-7	No TRV		No TRV	
Rhodium	7440-16-6	No TRV		No TRV	
Selenium	7782-49-2	7.60E-02	EPA 1999[f]	5.00E-01	EPA 1999[f]
Silicon	7440-21-3	No TRV		No TRV	
Silver	7440-22-4	3.75E-01	EPA 1999[f]	1.78E+02	EPA 1999[f]
Sodium	7440-23-5	No TRV		No TRV	
Strontium	7440-24-6	2.63E+02	Skoryna (1981) in Sample and others (1996)	No TRV	
Tantalum	7440-25-7	No TRV		No TRV	
Thallium	7440-28-0	1.31E-02	EPA 1999[f]	3.50E-01	EPA 1999[f]
Tin	7440-31-5	No TRV		No TRV	
Tungsten	7440-33-7	No TRV		No TRV	
Uranium	7440-61-1	3.07E+00	Paternain and others (1989) in Sample and others (1996)[c]	1.60E+01	Haseltine and Sileo (1983) in Sample and others (1996)[c]
Vanadium	7440-62-2	2.10E-01	Domingo and others (1986) in Sample and others (1996)[c]	1.14E+01	White and Dieter (1978) in Sample and others (1996)[c]
Yttrium	7440-65-5	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures			
		Coyote		Burrowing Owl	
		NOAEL TRV	Source	NOAEL TRV	Source
Lithium	7439-93-2	9.39E+00	Marathe and Thomas (1986) in Sample and others (1996)[c]	No TRV	
Magnesium	7439-95-4	No TRV		No TRV	
Manganese	7439-96-5	8.80E+01	Laskey and others (1982) in Sample and others (1996)[c]	9.77E+02	Laskey and Edens (1985) in Sample and others (1996)[c]
Mercury	7439-97-6	No TRV		No TRV	
Mercury - Hg+2	7487-94-7	1.01E+00	EPA 1999[f]	3.25E+00	EPA 1999[f]
Methylmercury	22967-92-6	3.20E-02	EPA 1999[f]	6.40E-03	EPA 1999[f]
Molybdenum	7439-98-7	2.58E-01	Schroeder and Mitchner (1971) in Sample and others (1996)[c]	3.53E+00	Lepore and Miller (1965) in Sample and others (1996)[c]
Nickel	7440-02-0	5.00E+01	EPA 1999[f]	6.50E+01	EPA 1999[f]
Potassium	7440-09-7	No TRV		No TRV	
Rhodium	7440-16-6	No TRV		No TRV	
Selenium	7782-49-2	7.60E-02	EPA 1999[f]	5.00E-01	EPA 1999[f]
Silicon	7440-21-3	No TRV		No TRV	
Silver	7440-22-4	3.75E-01	EPA 1999[f]	1.78E+02	EPA 1999[f]
Sodium	7440-23-5	No TRV		No TRV	
Strontium	7440-24-6	2.63E+02	Skoryna (1981) in Sample and others (1996)	No TRV	
Tantalum	7440-25-7	No TRV		No TRV	
Thallium	7440-28-0	1.31E-02	EPA 1999[f]	3.50E-01	EPA 1999[f]
Tin	7440-31-5	No TRV		No TRV	
Tungsten	7440-33-7	No TRV		No TRV	
Uranium	7440-61-1	3.07E+00	Paternain and others (1989) in Sample and others (1996)[c]	1.60E+01	Haseltine and Sileo (1983) in Sample and others (1996)[c]
Vanadium	7440-62-2	2.10E-01	Domingo and others (1986) in Sample and others (1996)[c]	1.14E+01	White and Dieter (1978) in Sample and others (1996)[c]
Yttrium	7440-65-5	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Terrestrial Exposures		Ingestion, Aquatic Exposures	
		Red-tailed Hawk		Canada Goose	
		NOAEL TRV	Source	NOAEL TRV	Source
Lithium	7439-93-2	No TRV		No TRV	
Magnesium	7439-95-4	No TRV		No TRV	
Manganese	7439-96-5	9.77E+02	Laskey and Edens (1985) in Sample and others (1996)[c]	9.77E+02	Laskey and Edens (1985) in Sample and others (1996)[c]
Mercury	7439-97-6	No TRV		No TRV	
Mercury - Hg+2	7487-94-7	3.25E+00	EPA 1999[f]	3.25E+00	EPA 1999[f]
Methylmercury	22967-92-6	6.40E-03	EPA 1999[f]	6.40E-03	EPA 1999[f]
Molybdenum	7439-98-7	3.53E+00	Lepore and Miller (1965) in Sample and others (1996)[c]	3.53E+00	Lepore and Miller (1965) in Sample and others (1996)[c]
Nickel	7440-02-0	6.50E+01	EPA 1999[f]	6.50E+01	EPA 1999[f]
Potassium	7440-09-7	No TRV		No TRV	
Rhodium	7440-16-6	No TRV		No TRV	
Selenium	7782-49-2	5.00E-01	EPA 1999[f]	5.00E-01	EPA 1999[f]
Silicon	7440-21-3	No TRV		No TRV	
Silver	7440-22-4	1.78E+02	EPA 1999[f]	1.78E+02	EPA 1999[f]
Sodium	7440-23-5	No TRV		No TRV	
Strontium	7440-24-6	No TRV		No TRV	
Tantalum	7440-25-7	No TRV		No TRV	
Thallium	7440-28-0	3.50E-01	EPA 1999[f]	3.50E-01	EPA 1999[f]
Tin	7440-31-5	No TRV		No TRV	
Tungsten	7440-33-7	No TRV		No TRV	
Uranium	7440-61-1	1.60E+01	Haseltine and Sileo (1983) in Sample and others (1996)[c]	1.60E+01	Haseltine and Sileo (1983) in Sample and others (1996)[c]
Vanadium	7440-62-2	1.14E+01	White and Dieter (1978) in Sample and others (1996)[c]	1.14E+01	White and Dieter (1978) in Sample and others (1996)[c]
Yttrium	7440-65-5	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Spotted Sandpiper		Great Blue Heron	
		NOAEL TRV	Source	NOAEL TRV	Source
Lithium	7439-93-2	No TRV		No TRV	
Magnesium	7439-95-4	No TRV		No TRV	
Manganese	7439-96-5	9.77E+02	Laskey and Edens (1985) in Sample and others (1996)[c]	9.77E+02	Laskey and Edens (1985) in Sample and others (1996)[c]
Mercury	7439-97-6	No TRV		No TRV	
Mercury - Hg+2	7487-94-7	3.25E+00	EPA 1999[f]	3.25E+00	EPA 1999[f]
Methylmercury	22967-92-6	6.40E-03	EPA 1999[f]	6.40E-03	EPA 1999[f]
Molybdenum	7439-98-7	3.53E+00	Lepore and Miller (1965) in Sample and others (1996)[c]	3.53E+00	Lepore and Miller (1965) in Sample and others (1996)[c]
Nickel	7440-02-0	6.50E+01	EPA 1999[f]	6.50E+01	EPA 1999[f]
Potassium	7440-09-7	No TRV		No TRV	
Rhodium	7440-16-6	No TRV		No TRV	
Selenium	7782-49-2	5.00E-01	EPA 1999[f]	5.00E-01	EPA 1999[f]
Silicon	7440-21-3	No TRV		No TRV	
Silver	7440-22-4	1.78E+02	EPA 1999[f]	1.78E+02	EPA 1999[f]
Sodium	7440-23-5	No TRV		No TRV	
Strontium	7440-24-6	No TRV		No TRV	
Tantalum	7440-25-7	No TRV		No TRV	
Thallium	7440-28-0	3.50E-01	EPA 1999[f]	3.50E-01	EPA 1999[f]
Tin	7440-31-5	No TRV		No TRV	
Tungsten	7440-33-7	No TRV		No TRV	
Uranium	7440-61-1	1.60E+01	Haseltine and Sileo (1983) in Sample and others (1996)[c]	1.60E+01	Haseltine and Sileo (1983) in Sample and others (1996)[c]
Vanadium	7440-62-2	1.14E+01	White and Dieter (1978) in Sample and others (1996)[c]	1.14E+01	White and Dieter (1978) in Sample and others (1996)[c]
Yttrium	7440-65-5	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Ingestion, Aquatic Exposures			
		Bald Eagle		Mink	
		NOAEL TRV	Source	NOAEL TRV	Source
Lithium	7439-93-2	No TRV		9.39E+00	Marathe and Thomas (1986) in Sample and others (1996)[c]
Magnesium	7439-95-4	No TRV		No TRV	
Manganese	7439-96-5	9.77E+02	Laskey and Edens (1985) in Sample and others (1996)[c]	8.80E+01	Laskey and others (1982) in Sample and others (1996)[c]
Mercury	7439-97-6	No TRV		No TRV	
Mercury - Hg+2	7487-94-7	3.25E+00	EPA 1999[f]	1.01E+00	EPA 1999[f]
Methylmercury	22967-92-6	6.40E-03	EPA 1999[f]	3.20E-02	EPA 1999[f]
Molybdenum	7439-98-7	3.53E+00	Lepore and Miller (1965) in Sample and others (1996)[c]	2.58E-01	Schroeder and Mitchner (1971) in Sample and others (1996)[c]
Nickel	7440-02-0	6.50E+01	EPA 1999[f]	5.00E+01	EPA 1999[f]
Potassium	7440-09-7	No TRV		No TRV	
Rhodium	7440-16-6	No TRV		No TRV	
Selenium	7782-49-2	5.00E-01	EPA 1999[f]	7.60E-02	EPA 1999[f]
Silicon	7440-21-3	No TRV		No TRV	
Silver	7440-22-4	1.78E+02	EPA 1999[f]	3.75E-01	EPA 1999[f]
Sodium	7440-23-5	No TRV		No TRV	
Strontium	7440-24-6	No TRV		2.63E+02	Skoryna (1981) in Sample and others (1996)
Tantalum	7440-25-7	No TRV		No TRV	
Thallium	7440-28-0	3.50E-01	EPA 1999[f]	1.31E-02	EPA 1999[f]
Tin	7440-31-5	No TRV		No TRV	
Tungsten	7440-33-7	No TRV		No TRV	
Uranium	7440-61-1	1.60E+01	Haseltine and Sileo (1983) in Sample and others (1996)[c]	3.07E+00	Paternain and others (1989) in Sample and others (1996)[c]
Vanadium	7440-62-2	1.14E+01	White and Dieter (1978) in Sample and others (1996)[c]	2.10E-01	Domingo and others (1986) in Sample and others (1996)[c]
Yttrium	7440-65-5	No TRV		No TRV	

Table C3-8 Toxicity Reference Values (TRVs) for COPCs and ROPCs

Constituent of Potential Concern	CAS Registry Number	Direct Contact, Aquatic Receptors			
		Aquatic Biota		Chinook Salmon and Other Salmonids	
		NOAEL TRV	Source	NOAEL TRV	Source
Lithium	7439-93-2	1.40E-02	Tier II Chronic (Suter & Tsao 1996)[d]	1.40E-02	Tier II Chronic (Suter & Tsao 1996)[d]
Magnesium	7439-95-4	No TRV		No TRV	
Manganese	7439-96-5	1.20E-01	Tier II Chronic (Suter & Tsao 1996)[d]	1.20E-01	Tier II Chronic (Suter & Tsao 1996)[d]
Mercury	7439-97-6	No TRV		No TRV	
Mercury - Hg+2	7487-94-7	7.70E-04	EPA 1999[f]	1.80E-04	Sensitive Species Test EC_{20} (Suter and Tsao 1996[d], Table 2)
Methylmercury	22967-92-6	2.80E-06	EPA 1999[f]	2.80E-06	EPA 1999[f]
Molybdenum	7439-98-7	3.70E-01	Tier II Chronic (Suter & Tsao 1996)[d]	3.70E-01	Tier II Chronic (Suter & Tsao 1996)[d]
Nickel	7440-02-0	5.20E-02	EPA 1999[f]	1.10E-02	Sensitive Species Test EC_{20} (Suter and Tsao 1996[d], Table 2)
Potassium	7440-09-7	No TRV		No TRV	
Rhodium	7440-16-6	No TRV		No TRV	
Selenium	7782-49-2	5.00E-03	EPA 1999[f]	2.60E-03	Sensitive Species Test EC_{20} (Suter and Tsao 1996[d], Table 2)
Silicon	7440-21-3	No TRV		No TRV	
Silver	7440-22-4	1.20E-04	EPA 1999[f]	1.20E-04	EPA 1999[f]
Sodium	7440-23-5	No TRV		No TRV	
Strontium	7440-24-6	1.50E+00	Tier II Chronic (Suter & Tsao 1996)[d]	1.50E+00	Tier II Chronic (Suter & Tsao 1996)[d]
Tantalum	7440-25-7	No TRV		No TRV	
Thallium	7440-28-0	4.00E-03	EPA 1999[f]	4.00E-03	EPA 1999[f]
Tin	7440-31-5	7.30E-02	Tier II Chronic (Suter & Tsao 1996)[d]	7.30E-02	Tier II Chronic (Suter & Tsao 1996)[d]
Tungsten	7440-33-7	No TRV		No TRV	
Uranium	7440-61-1	2.60E-03	Tier II Chronic (Suter & Tsao 1996)[d]	2.60E-03	Tier II Chronic (Suter & Tsao 1996)[d]
Vanadium	7440-62-2	2.00E-02	Tier II Chronic (Suter & Tsao 1996)[d]	2.00E-02	Tier II Chronic (Suter & Tsao 1996)[d]
Yttrium	7440-65-5	No TRV		No TRV	