Table 2.1-4
Numeric Standards Associated with Chemical-Specific ARARs
Portland Harbor Superfund Site
Portland, Oregon

	Statute/Regulation:		
	Receptor:	Aquatic Life	
		CMC (acute)	CCC (chronic)
	Consumption Rate:		
Contaminant	**CAS #**	**µg/L**	**µg/L**
Acenaphthene	83-32-9	NA	NA
Acenaphthylene	208-96-8	NA	NA
Aldrin	309-00-2	3.0[1]	NA
Anthracene	120-12-7	NA	NA
Arsenic	7440-38-2	340[2]	150[2]
Benzene	71-43-2	NA	NA
Benzo(a)anthracene	56-55-3	NA	NA
Benzo(a)pyrene	50-32-8	NA	NA
Benzo(b)fluoranthene	205-99-2	NA	NA
Benzo(g,h,i)perylene	191-24-2	NA	NA
Benzo(k)fluoranthene	207-08-9	NA	NA
Bis(2-ethylhexyl) phthalate (BEHP)	117-81-7	NA	NA
Cadmium	7440-43-9	0.52[2,3,14]	0.094[2,3,14]
Chlordanes	57-74-9	2.4[1]	0.0043
Chlorobenzene	108-90-7	NA	NA
Chromium	7440-47-3	NA	NA
Chromium (III)	16065-83-1	183[2,3,14]	24[2,3,14]
Chromium (VI)	18540-29-9	16[2]	11[2]
Chrysene	218-01-9	NA	NA
Copper	7440-50-8	5[2,3,14]	4[2,3,14]
Cyanide	57-12-5	22[4]	5.2[4]
DDx		1.1[1,6]	0.001[1,6]
DDD (2,4´- and 4,4-DDD)	72-54-8	NA	NA
2,4'-DDD	53-19-0	NA	NA
4,4'-DDD	72-54-8	NA	NA
DDE (2,4- and 4,4-DDE)	72-55-9	NA	NA
4,4'-DDE	72-55-9	NA	NA
DDT (2,4´- and 4,4´-DDT)	50-29-3	NA	NA
4,4'-DDT	50-29-3	NA	NA
Dibenz(a,h)anthracene	53-70-3	NA	NA

1,1-Dichloroethene (1,1-DCE)	75-35-4	NA	NA
cis-1,2-Dichloroethene (cis-1,2-DCE)	107-06-2	NA	NA
Dieldrin	60-57-1	0.24	0.056
2,4-Dichlorophenoxyacetic acid (2,4-D)	94-75-7	NA	NA
Ethylbenzene	100-41-4	NA	NA
Fluoranthene	206-44-0	NA	NA
Fluorene	7782-41-4	NA	NA
Hexachlorobenzene	118-74-1	NA	NA
gamma-Hexachlorocyclohexane (γ-BHC, or Lindane)	58-89-9	0.095	NA
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	70648-26-9	NA	NA
Indeno(1,2,3-c,d)pyrene	193-39-5	NA	NA
Lead	7439-92-1	14[2,3,14]	0.54[2,3,14]
Manganese	7439-96-5	NA	NA
Methylchlorophenoxypropionic acid (MCPP)	7085-19-0	NA	NA
Mercury	7439-97-6	1.4[2]	0.77[2]
2-Methylnaphthalene	91-57-6	NA	NA
Naphthalene	118-96-7	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	40321-76-4	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF)	57117-31-4	NA	NA
Pentachlorophenol	87-86-5	11[5]	8[5]
Perchlorate	14797-73-0	NA	NA
Phenanthrene	85-01-8	NA	NA
Polybrominated diphenyl ethers (PBDE)	67774-32-7	NA	NA
Polychlorinated Biphenyls (PCBs)	1336-36-3	NA	0.014
Polycyclic Aromatic Hydrocarbons (PAHs)	130498-29-2	NA	NA
Pyrene	129-00-0	NA	NA
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	51207-31-9	NA	NA
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	1746-01-6	NA	NA
Tetrachloroethene (PCE)	127-18-4	NA	NA
Toluene	108-88-3	NA	NA
Total Petroleum Hydrocarbons (TPH) C10-C12 Aliphatic		NA	NA
Tributyltin (TBT)	688-73-3	0.46	0.072
Trichloroethene (TCE)	79-01-6	NA	NA
2-(2,4,5-Trichlorophenoxy)propionic acid (2,4,5-TP)	93-72-1	NA	NA
Vanadium	7440-62-2	NA	NA
Vinyl Chloride	75-01-04	NA	NA
Xylenes	1330-20-7	NA	NA
Zinc	7440-66-6	36[2,3,14]	36[2,3,14]

Notes:

1 - If evaluation is to be done using an averaging period, the acute criteria values given should be divided by 2 to obtain a val

2 - Expressed in terms of dissolved metal in the water column.

3 - Expressed as a function of hardness (mg/L) in the water column. The value given corresponds to a hardness of 25 mg/kg.

4 - Expressed as free cyanide.

5 - Expressed as a function of pH. Value corresponds to a pH of 7.2.

6 - This criterion applies to DDT and its metabolites (i.e., the total concentration of DDT and its metabolites should not excee

7 - This criterion is based on carcinogenicity at a 10^{-6} risk.

8 - This criterion for arsenic refers to the inorganic form only.

9 - This criterion for manganese is not based on toxic effects, but rather is intended to minimize objectionable qualities such

10 - EPA is not updating criteria for this chemical pollutant at this time; thus, the current criterion apply.

11 - Critieria are calculated using the following table:

Chemical	**mA**	**bA**
Cadmium	1.128	-3.828
Chromium (III)	0.819	3.7256
Copper	0.9422	-1.464
Lead	1.273	-1.460
Pentachlorophenol		
Zinc	0.8473	0.884

12 - This criterion is based on carcinogenicity of 10-4 risk.

13 - This criterion is based on carcinogenicity of 10-5 risk.

14 - Critieria are calculated using the following table:

Chemical	**mA**	**bA**
Cadmium	1.0166	-3.924
Chromium (III)	0.819	3.7256
Copper	0.9422	-1.700
Lead	1.273	-1.46
Zinc	0.8473	0.884

ARARs - Applicable or relevant and appropriate requirements

CCC - Criterion Continous Concentration

CMC - Criteria Maximum Concentration

MCL - Maximum Contaminant Level

NA - not available

µg/L - micrograms per liter

µg/kg -micrograms per kilogram

Surface Water					
Clean Water Act, 33 USC 1313 and1314, Section 304(a) List				Oregon Water F	
Human Health				Aquatic Life	
Current (water + organism)	Current (oganism only)	2014 Update (water + oganism)	2014 Update (organism only)	CMC (acute)	CCC (chronic)
17 g/day	17 g/day	22 g/day	22 g/day		
µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
670	990	200	400	NA	NA
NA	NA	NA	NA	NA	NA
0.000049[7]	0.00005[7]	0.0000010	0.0000010	3[1]	NA
NA	NA	NA	NA	NA	NA
0.018[7,8]	0.14[7,8]	Note 10	Note 10	340[7]	150[2]
2.2[7]	51[7]	0.45-1.6	6.2-23	NA	NA
0.0038[7]	0.018[7]	0.011	0.013	NA	NA
0.0038[7]	0.018[7]	0.00077	0.00088	NA	NA
0.0038[7]	0.018[7]	0.00037	0.00038	NA	NA
NA	NA	NA	NA	NA	NA
0.0038[7]	0.018[7]	0.011	0.012	NA	NA
1.2[7]	2.2[7]	0.028	0.029	NA	NA
5	NA	Note 10	Note 10	0.8[3,11]	0.9[2,3,11]
0.00080[7]	0.00081[7]	0.0000068	0.0000068	2.4[1]	0.0043
100	1,600	90	600	NA	NA
100	NA	Note 10	NA	NA	NA
NA	NA	NA	NA	183[2,3,11]	24[2,3,11]
NA	NA	NA	NA	16[2]	11[2]
0.0038[7]	0.018[7]	0.022	0.022	NA	NA
1,300	NA	Note 10	Note 10	5[3,11]	4[3,11]
140	140	3	400	22[4]	5.2[4]
NA	NA	NA	NA	1.1[1,6]	0.001[1,6]
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
0.00031[7]	0.00031[7]	0.000019	0.000019	NA	NA
NA	NA	NA	NA	NA	NA
0.00022[7]	0.00022[7]	0.000038	0.000038	NA	NA
NA	NA	NA	NA	NA	NA
0.00022[7]	0.00022[7]	0.0000072	0.0000072	NA	NA
0.0038[7]	0.018[7]	0.000063	0.000063	NA	NA

330	7,100	200	4,000	NA	NA
0.38[7]	37[7]	0.29	13	NA	NA
0.000052[7]	0.000054[7]	0.000010	0.000010	0.24	0.056
NA	NA	NA	NA	NA	NA
530	2,100	400	1,000	NA	NA
130	140	40	50	NA	NA
1,100	5,300	30	40	NA	NA
0.00028[7]	0.00029[7]	0.0000064	0.0000064	NA	NA
0.98	1.8	2.5	2.8	0.95	0.08
NA	NA	NA	NA	NA	NA
0.0038[7]	0.018[7]	0.0045	0.0046	NA	NA
NA	NA	NA	NA	14[2,3,11]	0.54[2,3,11]
50[9]	100	Note 10	Note 10	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	2.4	0.012
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
0.27[7]	3.0[7]	0.02	0.02	11[5]	8[5]
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
0.000064[7]	0.000064[7]	Note 10	Note 10	2	0.014
NA	NA	NA	NA	NA	NA
830	4,000	20	20	NA	NA
NA	NA	NA	NA	NA	NA
0.000000005[7]	0.0000000051[7]	Note 10	Note 10	NA	NA
0.69[7]	3.3[7]	10	40	NA	NA
1,000	1,500	300	2,000	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	0.46	0.063
2.5[7]	30[7]	0.5	4	NA	NA
NA	NA	NA	NA	NA	NA
NA	NA	NA	NA	NA	NA
0.025[7]	2.4[7]	0.018	0.68	NA	NA
NA	NA	NA	NA	NA	NA
7,400	26,000	Note 10	Note 10	36[2,3,11]	35[2,3,11]

lue that is more comparable to a CMC derived using the 1985 Guidelines.

ed this value).

as laundry stains and objectionable tastes in beverages.

mC	bC	CMC	CCC
0.7409	-4.719	0.8	0.09
0.819	0.6848	183	24
0.8545	-1.465	5	4
1.273	-4.705	14	0.54
		11	8
0.8473	0.884	36	35

mC	bC	CMC	CCC
0.7409	-4.719	0.52	0.094
0.819	0.6848	183	24
0.8545	-1.702	3.6	2.7
1.273	-4.705	14	0.54
0.8473	0.884	36	36

		Surface Water & Groundwater
Pollution Control Act ORS 468B.048		Safe Drinking Water Act 42 USC 300f, 40 CFR Part 141, 143
Human Health		Human Health
Current (water + organism)	Current (oganism only)	MCL
175 g/day	175 g/day	
µg/L	µg/L	µg/L
95	99	NA
NA	NA	NA
0.0000050	0.0000050	NA
NA	NA	NA
2.1[8,12]	2.1[8,13]	10
0.44	1.4	5
0.0013	0.0018	NA
0.0013	0.0018	0.2
0.0013	0.0018	NA
0.0013	0.0018	NA
0.0013	0.0018	NA
0.2	0.22	6
NA	NA	5
0.000081	0.000081	2
74	160	100
NA	NA	100
NA	NA	NA
NA	NA	NA
0.0013	0.0018	NA
1,300	NA	1,300
130	130	200
NA	NA	NA
NA	NA	NA
NA	NA	NA
0.000031	0.000031	NA
NA	NA	NA
0.000022	0.000022	NA
NA	NA	NA
0.000022	0.000022	NA
0.0013	0.0018	NA

230	710	7
NA	NA	70
0.0000053	0.0000054	NA
NA	NA	70
160	210	700
14	14	NA
390	530	NA
0.000029	0.000029	1
0.17	0.18	0.2
NA	NA	NA
0.0013	0.0018	NA
NA	NA	15
NA	NA	NA
NA	NA	NA
NA	NA	2
NA	NA	NA
NA	NA	NA
NA	NA	NA
NA	NA	NA
0.15	0.30	1.0
NA	NA	15
NA	NA	NA
NA	NA	NA
0.0000064	0.0000064	0.5
NA	NA	NA
290	400	NA
NA	NA	NA
0.00000000051	0.00000000051	0.00003
0.24	0.33	5
720	1,500	1,000
NA	NA	NA
NA	NA	NA
1.4	3.0	5
NA	NA	50
NA	NA	NA
0.023	0.24	2
NA	NA	10,000
2,100	2,600	NA

Table 2.2-1
Summary of Portland Harbor PRGs by RAO and Media
Portland Harbor Superfund Site
Portland, Oregon

	HUMAN HEALTH											
	RAO 1			RAO 2			RAO 3		RAO 4		RAO 5	
	Ingestion/Direct Contact			Fish/Shellfish Consumption			Protected Water Uses		Migration of Contaminated Groundwater		Direct Contact/Ingestion	
Contaminant	**Units**	**Beach**	**Sediment**	**Units**	**Tissue**	**Sediment**	**Units**	**Surface Water**	**Units**	**Groundwater**	**Units**	**Sediment**
Aldrin				µg/kg	0.06	2	µg/L	0.000005				
Arsenic	mg/kg	3	3	mg/kg	0.001		µg/L	0.02	µg/L	0.02		
Benzene									µg/L	0.4		
BEHP				ug/kg	72		µg/L	0.2			µg/kg	135
Cadmium											mg/kg	5
Chlordanes				µg/kg	3	1.5	µg/L	0.000081			µg/kg	18
Chlorobenzene									µg/L	74		
Chromium							µg/L	100	µg/L	100		
Copper									µg/L	1,300	mg/kg	149
Cyanide									µg/L	130		
DDx				µg/kg	3	6.1					µg/kg	63
DDD							µg/L	0.000031	µg/L	0.00003		
4,4´-DDE												
DDE							µg/L	0.000031	µg/L	0.00003	µg/kg	31
DDT							µg/L	0.000022	µg/L	0.00002		
1,1-DCE									µg/L	7		
cis-1,2-DCE									µg/L	0.4		
Dieldrin				µg/kg	0.06	0.07					µg/kg	62
2,4-D									µg/L	70		
Ethylbenzene									µg/L	160		
Hexachlorobenzene				µg/kg	0.6	0.3	µg/L	0.00003				
Lindane											µg/kg	5
Lead											mg/kg	128
Manganese									µg/L	50		
MCPP							µg/L	16				
Mercury				mg/kg	0.03						mg/kg	1.1
Pentachlorophenol				µg/kg	130		µg/L	0.2	µg/L	0.2		
Perchlorate									µg/L	15		
PBDEs				µg/kg	26							
PCBs	µg/kg		370	µg/kg	0.3	9	µg/L	0.000006			µg/kg	64
PAHs											µg/kg	23,000
cPAHs (BaP eq)	µg/kg	12	106	µg/kg	7.1	3,950	µg/L	0.001	µg/L	0.0013		
Acenaphthene												
Acenaphthylene												
Anthracene												
Benzo(a)anthracene							µg/L	0.001	µg/L	0.001		
Benzo(a)pyrene							µg/L	0.001	µg/L	0.001		
Benzo(b)fluoranthene							µg/L	0.001	µg/L	0.001		
Benzo(g,h,i)perylene												
Benzo(k)fluoranthene							µg/L	0.001	µg/L	0.001		
Chrysene							µg/L	0.001	µg/L	0.001		
Dibenz(a,h)anthracene							µg/L	0.001	µg/L	0.001		
Fluoranthene												
Fluorene												
Indeno(1,2,3-c,d)pyrene							µg/L	0.001	µg/L	0.001		
2-Methylnaphthalene												
Naphthalene												
Phenanthrene												
Pyrene												
Dioxins/Furans (2,3,7,8-TCDD eq)	µg/kg		0.01				µg/L	0.0000000005				
1,2,3,4,7,8-HxCDF				µg/kg	0.00006	0.000002						
1,2,3,7,8-PeCDD				µg/kg	0.000006	0.0001						
2,3,4,7,8-PeCDF				µg/kg	0.00002	0.0002						
2,3,7,8-TCDF				µg/kg	0.00006	0.0004						
2,3,7,8-TCDD				µg/kg	0.000006	0.0001						
PCE									µg/L	0.2		
Toluene									µg/L	720		

TPH C10-C12 Aliphatic												
TBT											mg/kg	24
TCE									µg/L	1.4		
2,4,5-TP									µg/L	50		
Vanadium												
Vinyl Chloride									µg/L	0.02		
Xylenes									µg/L	10,000		
Zinc											mg/kg	459

Notes:

NA - Not available

1 - Tissue values are for methyl mercury.

2 - The PRG is less than the achievable detection limit; thus, the PRG is evaluated at the established detection limit from the background data set.

3 - This value is for the dissolved fraction.

4 - Criterion is applied as hexavalent chromium.

ECOLOGICAL						HUMAN HEALTH & ECOLOGICAL	
RAO 6		RAO 7		RAO 8		RAO 9	
Biota (Predator) Ingestion		Direct Contact/Ingestion		Direct Contact/Ingestion Migration of Contaminated		Migration of Contaminants	
Units	Sediment	Units	Surface Water	Units	Pore Water	Units	River Bank Soil/Sediment
						µg/kg	2
				µg/L	150	mg/kg	3
				µg/L	130		
		µg/L	3			µg/kg	135
				µg/L	0.091	mg/kg	5
						µg/kg	1.5
				µg/L	64		
				µg/L	11[3,4]		
mg/kg		µg/L	3	µg/L	2.74[3]	mg/kg	149
				µg/L	5.2		
µg/kg	2,849	µg/L	0.01	µg/L	0.001	µg/kg	6.1
µg/kg	2.8						
µg/kg	144						
				µg/L	0.001		
				µg/L	25		
				µg/L	590		
						µg/kg	0.07
		µg/L	7	µg/L	7.3		
						µg/kg	0.3
						µg/kg	5
				µg/L	0.5	mg/kg	128
				µg/L	1,433		
mg/kg	NA					mg/kg	1.1
				µg/L	9,300		
µg/kg	36	µg/L	0.2	µg/L	0.01	µg/kg	9
µg/kg						µg/kg	23,000
						µg/kg	12
				µg/L	23		
				µg/L	0.73		
		µg/L	0.027	µg/L	0.03		
		µg/L	0.014	µg/L	0.01		
				µg/L	0.68		
				µg/L	0.44		
				µg/L	0.64		
				µg/L	2		
				µg/L	0.28		
				µg/L	6.2		
				µg/L	3.9		
				µg/L	0.28		
				µg/L	2.1		
		µg/L	12	µg/L	12		
				µg/L	6.3		
				µg/L	10		
µg/kg							
µg/kg	0.03					µg/kg	0.000002
µg/kg	0.001					µg/kg	0.0001
µg/kg	0.004					µg/kg	0.0002
µg/kg	0.004					µg/kg	0.0004
µg/kg	0.0008					µg/kg	0.0001
				µg/L	9.8		

				µg/L	2.6		
mg/kg		µg/L	0.06			mg/kg	24
				µg/L	47		
				µg/L	20		
				µg/L			
				µg/L	13		
		µg/L	36.5[3]	µg/L	36.5	mg/kg	459

Table 2.2-2
Summary of COC Selection Process
Portland Harbor Superfund Site
Portland, Oregon

Contaminant	CAS RN	BERA	BHHRA	ARAR
Acenaphthene	83-32-9	X		
Acenaphthylene	208-96-8	X		
Aldrin	309-00-2	X	X	X
Aluminum	7429-90-5	X		
Ammonia	7664-41-7	X		
Anthracene	120-12-7	X		X
Antimony	7440-36-0	X	X	
Aroclor 1254	11097-69-1	X		
Arsenic	7440-38-2	X	X	X
Barium	7440-39-3	X		
Benzene	71-43-2	X		X
Benzo(a)anthracene	56-55-3	X	X	X
Benzo(a)pyrene	50-32-8	X	X	X
Benzo(b)fluoranthene	205-99-2	X	X	x
Benzo(g,h,i)perylene	191-24-2	X		X
Benzo(k)fluoranthene	207-08-9	X	X	X
Benzyl alcohol	100-51-6	X		
Beryllium	7440-41-7	X		
Bis(2-ethylhexyl) phthalate (BEHP)	117-81-7	X	X	X
Cadmium	7440-43-9	X		X
Carbazole	86-74-8	X		
Carbon disulfide	75-15-0	X		
Chlordane	57-74-9	X	X	X
cis-Chlordane	5103-71-9	X		
Chlorobenzene	108-90-7	X		X

Chloroethane	75-00-3	X		
Chloroform	67-66-3	X		
Chromium	7440-47-3	X	X	X
Chrysene	218-01-9	X	X	X
Cobalt	7440-48-4	X		
Copper	7440-50-8	X		X
Cyanide	57-12-5	X		X
1,2-Dichlorobenzene	95-50-1	X		
1,4-Dichlorobenzene	106-46-7	X		
DDD (2,4´- and 4,4-DDD)	72-54-8	X	X	X
2,4'-DDD	53-19-0	X		
4,4'-DDD	72-54-8	X		
DDE (2,4- and 4,4-DDE)	72-55-9	X	X	X
4,4'-DDE	72-55-9	X		
DDT (2,4´- and 4,4´-DDT)	50-29-3	X	X	X
4,4'-DDT	50-29-3	X		
Dibenz(a,h)anthracene	53-70-3	X	X	X
Dibenzofuran	132-64-9	X		
1,1-Dichloroethene (1,1-DCE)	75-35-4	X		X
cis-1,2-Dichloroethene (cis-1,2-DCE)	107-06-2	X		X
Dieldrin	60-57-1	X	X	X
Di-n-butyl phthalate	84-74-2	X		
2,4-Dichlorophenoxyacetic acid (2,4-D)	94-75-7			X
Endosulfan	115-29-7	X		
Endrin	72-20-8	X		
Endrin ketone	53494-70-5	X		
Ethylbenzene	100-41-4	X		X
Fluoranthene	206-44-0	X		X
Fluorene	7782-41-4	X		X
Heptachlor epoxide	1024-57-3	X		
Hexachlorobenzene	118-74-1		X	X

beta-Hexachlorocyclohexane (β-BHC)	319-85-7	X		
delta-Hexachlorocyclohexane (δ-BHC)	608-73-1	X		
gamma-Hexachlorocyclohexane (γ-BHC, or Lindane)	58-89-9	X		X
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	70648-26-9			X
Indeno(1,2,3-c,d)pyrene	193-39-5	X	X	X
Iron	7439-89-6	X		
Isopropylbenzene	98-82-8	X		
Lead	7439-92-1	X	X	X
Magnesium	7439-95-4	X		
Manganese	7439-96-5	X		X
Methylchlorophenoxypropionic acid (MCPP)	7085-19-0		X	X
Mercury	7439-97-6	X	X	X
2-Methylnaphthalene	91-57-6	X		
4-Methylphenol (p-Cresol)	106-44-5	X		
Monobutyltin		X		
Naphthalene	118-96-7	X		X
Nickel	7440-02-0	X		
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	40321-76-4			X
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF)	57117-31-4			X
Pentachlorophenol	87-86-5		X	X
Perchlorate	14797-73-0	X		
Phenanthrene	85-01-8	X		
Phenol	108-95-2	X		
Polybrominated diphenyl ethers (PBDE)	67774-32-7		X	
Polychlorinated Biphenyls (PCBs)	1336-36-3	X	X	X
Polycyclic Aromatic Hydrocarbons (PAHs)	130498-29-2	X	X	X
Potassium	7440-09-7	X		
Pyrene	129-00-0	X		
Silver	7440-22-4	X		
Sodium	7440-23-5	X		
Sulfide	18496-25-8	X		

2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	51207-31-9			X
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	1746-01-6	X	X	X
Tetrachloroethene (PCE)	127-18-4			X
Toluene	108-88-3	X		X
Total Petroleum Hydrocarbons (TPH) C10-C12 Aliphatic		X		
Total Petroleum Hydrocarbons (TPH) C4 - C6 Aliphatic		X		
Total Petroleum Hydrocarbons (TPH) C6 - C8 Aliphatic		X		
Total Petroleum Hydrocarbons (TPH) C8 - C10 Aromatic		X		
Total Petroleum Hydrocarbons (TPH), diesel range		X		
Total Petroleum Hydrocarbons (TPH), gasoline-range		X		
Total Petroleum Hydrocarbons (TPH), residual-range		X		
Tributyltin (TBT)	688-73-3	X		X
Trichloroethene (TCE)	79-01-6	X		X
1,2,4-Trimethylbenzene	95-63-6	X		
1,3,5-Trimethylbenzene	108-67-8	X		
2-(2,4,5-Trichlorophenoxy)propionic acid (2,4,5-TP)	93-72-1			X
Vanadium	7440-62-2	X		X
Vinyl Chloride	75-01-04			X
m-Xylene	108-38-3	X		
o-Xylene	95-47-6	X		
p-Xylene	106-42-3	X		
Xylenes	1330-20-7	X		X
Zinc	7440-66-6	X		X

Notes:

BERA - baseline ecological risk assessment

BHHRA - baseline human health risk assessment

COC - contaminant of concern

Identified as a COC	Rationale for Including/Eliminating
Y	Evaluate as PAH
Y	Evaluate as PAH
Y	Human health: shellfish
N	Not ecologically significant
N	Ammonia only has an HQ=3 based on FPM, which does not reliably predict sediment toxicity for individual contaminants.
Y	Evaluate as PAH
N	Infrequent and/or anomalous detections in fish
N	Evaluate as PCBs
Y	Human health: beach, sediment, water, fish/shellfish Known groundwater plumes at site.
N	Not ecologically significant
Y	Known groundwater plume at site.
Y	Human health: beach, sediment, water, fish/shellfish Evaluate as cPAH and PAH
Y	Human health: beach, sediment, water, fish/shellfish Evaluate as cPAH and PAH
Y	Human health: beach, sediment, water, fish/shellfish Evaluate as cPAH and PAH
Y	Evaluate as PAH
Y	Human health: beach, sediment, water, fish/shellfish Evaluate as cPAH and PAH
N	Not ecologically significant
N	Not ecologically significant
Y	Human health: fish Ecologically significant contaminant
Y	Ecologically significant contaminant
N	Not ecologically significant
N	Not ecologically significant
Y	Human health: fish Ecologically significant contaminant
N	Evaluate as Chlordane
Y	Known groundwater plume extending to river and mobilizing DDx. Potential NAPL.

N	Not ecologically significant
N	Not ecologically significant
Y	Human health: surface water Known groundwater plumes at site.
Y	Human health: beach, sediment, water, fish/shellfish Evaluate as cPAH and PAH
N	Not ecologically significant
Y	Ecologically significant contaminant Known groundwater plumes at site
Y	Ecologically significant contaminant Known groundwater plumes at site
N	Not ecologicially significant
N	Not ecologicially significant
Y	Human health: fish/shellfish Ecologically significant contaminant Evaluate as DDx
Y	Evaluate as DDx
Y	Evaluate as DDx
Y	Human Health: fish/shellfish Ecologically significant contaminant Evaluate as DDE and DDx
Y	Evaluate as sum DDE and DDx
Y	Human health: fish/shellfish Ecologically significant contaminant Evaluate as DDx
Y	Evaluate as DDx
Y	Human health: beach, sediment, water, fish/shellfish Evaluate as cPAH and PAH
N	Not ecologically significant
Y	PCE/TCE plumes identified at site. DCE is a breakdown product of PCE/TCE.
Y	PCE/TCE plumes identified at site. DCE is a breakdown product of PCE/TCE.
Y	Human health: fish/shellfish Ecologically significant contaminant
N	Not ecologically significant
Y	Known groundwater plume.
N	Not ecologically significant
N	Not ecologically significant
N	Not ecologically significant
Y	Ecologically significant contaminant Known groundwater plumes at site
Y	Evaluate as PAH
Y	Evaluate as PAH
N	Not ecologically significant
Y	Human health: fish

N	beta-Hexachlorocyclohexane only has an HQ=1.9 based on FPM, which does not reliably predict sediment toxicity for individual contaminants.
N	Not ecologically significant
Y	Ecologically significant contaminant
Y	Dioxin/Furan congener contributing most to 2,3,7,8-TCDD risk
Y	Human health: beach, sediment, water, fish/shellfish Evaluate as PAH
N	Not a hazardous substance
N	Not a hazardous substance
Y	Human health: Infrequent and/or anomalous detections in fish Ecologically significant contaminant. Eliminated for dietary pathway due to infrequent and/or anomalous detections in fish.
N	Not ecologically significant
Y	Ecologically significant contaminant Known groundwater plumes at site
Y	Human health: surface water
Y	Human health: fish tissue Ecologically significant contaminant.
Y	Evaluate as PAH
N	Not ecologically significant
N	Not a hazardous substance
Y	Evaluate as PAH
N	
Y	Dioxin/Furan congener contributing most to 2,3,7,8-TCDD risk
Y	Dioxin/Furan congener contributing most to 2,3,7,8-TCDD risk
Y	Human health: shellfish Known groundwater plumes
Y	Ecologically significant contaminant
Y	Evaluate as PAH
N	Not ecologically significant
Y	Human health: fish
Y	Human health: sediment, fish/shellfish Ecologically significant contaminant.
Y	Human health: beach, sediment, water, fish/shellfish Ecologically significant contaminant
N	Not ecologically significant
Y	Evaluate as PAH
N	Not ecologically significant
N	Not ecologically significant
N	Not ecologically significant

Y	Dioxin/Furan congener contributing most to 2,3,7,8-TCDD risk
Y	Human health: sediment, fish/shellfish Ecologically significant contaminant.
Y	PCE plumes identified at site.
Y	Known groundwater plume at site.
Y	Not a hazardous substance; co-mingled with other hazardous substances Ecologially significant contaminant Known TPH plumes at site
N	Not a hazardous substance; co-mingled with other hazardous substances
N	Not a hazardous substance; co-mingled with other hazardous substances
N	Not a hazardous substance; co-mingled with other hazardous substances
N	Not a hazardous substance; co-mingled with other hazardous substances
N	Not a hazardous substance; co-mingled with other hazardous substances
N	Not a hazardous substance; co-mingled with other hazardous substances
Y	Ecologically significant contaminant
Y	Known groundwater plume extending to river. Potential for others.
N	Not ecologically significant
N	Not ecologically significant
Y	Known groundwater plume
Y	Ecologically significant contaminant
Y	PCE/TCE plumes identified at site. Vinyl chloride is a breakdown product of PCE/TCE.
N	Not ecologically significant
N	Not ecologically significant
N	Not ecologically significant
Y	Known groundwater plume at site.
Y	Ecologically significant contaminant Known groundwater plumes at site

Table 2.2-3
Basis for Portland Harbor COC Selection by RAO and Media
Portland Harbor Superfund Site
Portland, Oregon

	RAO 1	
	Human Health Ingestion/Direct Contact	
Contaminant	**Beach**	**Sediment**
Aldrin		
Arsenic	R	R
Benzene		
BEHP		
Cadmium		
Chlordane		
Chlorobenzene		
Chromium		
Copper		
Cyanide		
DDx		
DDD (2,4- and 4,4-DDD)		
4,4'-DDD		
DDE (2,4- and 4,4-DDE)		
4,4'-DDE		
DDT (2,4- and 4,4-DDT)		
4,4'-DDT		
1,1-DCE		
cis-1,2-DCE		
Dieldrin		
2,4-D acid		
Ethylbenzene		
Hexachlorobenzene		
Lindane		
Lead		
Manganese		
MCPP		
Mercury		
Pentachlorophenol		
Perchlorate		
PBDE		
PCBs		R
PAHs	R	R
Acenaphthene		
Acenaphthylene		
Anthracene		

Benzo(a)anthracene		
Benzo(a)pyrene		
Benzo(b)fluoranthene		
Benzo(g,h,i)perylene		
Benzo(k)fluoranthene		
Chrysene		
Dibenz(a,h)anthracene		
Fluoranthene		
Fluorene		
Indeno(1,2,3-c,d)pyrene		
2-Methylnaphthalene		
Naphthalene		
Phenanthrene		
Pyrene		
2,3,7,8-TCDD Eq		R
1,2,3,4,7,8-HxCDF		
1,2,3,7,8-PeCDD		
2,3,4,7,8-PeCDF		
2,3,7,8-TCDF		
2,3,7,8-TCDD		
PCE		
Toluene		
TPH C10-C12 Aliphatic		
TBT		
TCE		
2,4,5-TP acid		
Vanadium		
Vinyl Chloride		
Xylenes		
Zinc		

Notes:

R - Conclusion from Baseline Risk Assessment

A - ARAR

HUMAN HEALTH			
RAO 2		RAO 3	RAO 4
Human Health Fish/Shellfish Consumption		Human Health Protected Water Uses	Human Health Migration of Contaminated Groundwater
Tissue	Sediment	Surface Water	Groundwater
R	R	A	
R	R	A	A
			A
R	R	A	
R	R	A	
			A
		A	A
			A
			A
R	R		
		R	R
		A	A
		A	A
		R	R
		A	A
			A
			A
R	R		
			A
			A
R	R	A	
			R
		R	
R	R		
R	R	A	A
			A
R	R		
R	R	A	
R	R	A	A

		A	
R	R		
R	R		
R	R		
R	R		
R	R		
			A
			A
			A
			A
			A
			A

		ECOLOGICAL
RAO 5	**RAO 6**	**RAO 7**
Ecological Direct Contact/Ingestion	**Ecological Biota (Predator) Ingestion**	**Ecological Direct Contact/Ingestion**
Sediment	**Sediment**	**Surface Water**
R		R
R		
R		
R	R	R
R	R	R
	R	
R		
		R
R		
R		
R	R	
R	R	R
R	R	

		R
		R
		R
	R	
	R	
	R	
	R	
	R	
	R	
R	R	R
R		R

RAO 8	RAO 9
Ecological Direct Contact/Ingestion	Human Health & Ecological Migration of Contaminants
Pore Water	River Bank Soil/Sediment
	R
A	R
R	
	R
R	R
	R
R	
A	
R	R
R	
R	R
R	
R	
R	
	R
R	
	R
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	R
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	R
R	
R	
	R
R	
R	
R	
R	
R	R

Table 2.2-4
RAO 1 PRG Derivation
Portland Harbor Superfund Site
Portland, Oregon

	RAO 1 Reduce cancer and noncancer fishing, occupational, recreati	
Contaminant	**Units**	**Risk-based PRG (10^{-6})**
Arsenic	mg/kg	0.4
PCBs	µg/kg	
cPAHs (BaP Eq)	µg/kg	12
Dioxins/Furans (2,3,7,8-TCDD eq)	µg/kg	

Notes:

ARAR - Applicable or relevant and appropriate requirement
NA - Not applicable
PRG - Preliminary Remediation Goal
RAO - Remedial Action Objective
HQ - Hazard Quotient

· risks to people from incidental ingestion of and dermal contact with COCs in sediments and beaches to ex
onal, and ceremonial uses.

Beach Sediment						Sedim
Risk-based PRG (HQ=1)	ARAR	Background	PRG	Units	Risk-based PRG (10^{-6})	Risk-based PRG (HQ=1)
37	NA	3	3	mg/kg	1	435
	NA			µg/kg	370	14,760
	NA	12	12	µg/kg	106	
	NA			µg/kg	0.01	1.0

posure levels that are acceptable for

ent

ARAR	Background	PRG
NA	3	3
NA	9	370
NA	12	106
NA		0.01

Table 2.2-5
RAO 2 PRG Derivation
Portland Harbor Superfund Site
Portland, Oregon

Contaminant	RAO 2 Reduce cancer and noncancer risks to acceptable exposure levels (direct a				
	Tissue (fillet)				
	Units	Risk-based PRGs (10-6)	Risk-based PRGs (HQ=1)	ARAR	Target Level
Aldrin	µg/kg	0.06	8	NA	0.06
Arsenic	mg/kg	0.001	0.08	NA	0.001
BEHP	µg/kg	72	5,246	NA	72
Chlordanes	µg/kg	3	131	NA	3
DDx	µg/kg	3	94	NA	3
Dieldrin	µg/kg	0.06	13	NA	0.06
Hexachlorobenzene	µg/kg	0.6	210	NA	0.6
Mercury	mg/kg	--	26[1]	0.03[1]	0.03[1]
Pentachlorophenol	µg/kg	130		NA	130
PBDEs	µg/kg		26	NA	26
PCBs	µg/kg	0.5	0.25	NA	0.25
cPAHs (BaP Eq)	µg/kg	7.1[2]		NA	7.1
1,2,3,4,7,8-HxCDF	µg/kg	0.00008	0.00006	NA	0.00006
1,2,3,7,8-PeCDD	µg/kg	0.000008	0.000006	NA	0.000006
2,3,4,7,8-PeCDF	µg/kg	0.00003	0.00002	NA	0.00002
2,3,7,8-TCDD	µg/kg	0.000008	0.000006	NA	0.000006
2,3,7,8-TCDF	µg/kg	0.00008	0.00006	NA	0.00006

Notes:

ARAR - Appropriate, relavent and applicable requirement

NA - Not available

ND - Not determined or detected

BaP Eq - benzo(a)pyrene equivalent

1 - Tissue values are for methyl mercury.

2 - Tissue concentration is for shellfish assuming a consumption rate of 3.3 g/day

nd indirect) for human consumption of COCs in fish and shellfish.

Sediment					
Units	Risk-based PRG (10-6)	Risk-based PRG (HQ=1)	ARAR	Background	PRG
µg/kg	2	260	NA		2
mg/kg			NA	3	
µg/kg			NA	61	
µg/kg	1.5	181	NA	0.6	1.5
µg/kg	6.1	307	NA	3	6.1
µg/kg	0.07	40	NA		0.07
µg/kg	0.2	63	NA	0.3	0.3
mg/kg			NA	0.034	
µg/kg			NA		
µg/kg			NA		
µg/kg	0.2	0.1	NA	9	9
µg/kg	3,950		NA	12	3,950
µg/kg	0.00001	0.000002	NA		0.000002
µg/kg	0.00001	0.00001	NA	0.0001	0.0001
µg/kg	0.0001	0.0001	NA	0.0002	0.0002
µg/kg	0.00001	0.00001	NA	0.0001	0.0001
µg/kg	0.0005	0.0004	NA	0.0002	0.0004

Table 2.2-6
RAO 3 PRG Derivation
Portland Harbor Superfund Site
Portland, Oregon

Contaminant	RAO 3 Reduce cancer and noncancer risks to people from direct contact (ingestion, inhalation, and dermal contact) with COCs in surface water to exposure levels that are acceptable for fishing, occupational, recreational, and potential drinking water supply.				
	Surface Water				
	Units	Risk (RSL 10^{-6})	MCL	ARAR (AWQC)	PRG
Aldrin	µg/L	0.0046	NA	0.000005	0.000005
Arsenic	µg/L	0.052	10	0.018	0.018
BEHP	µg/L	5.6	6	0.2	0.2
Chlordanes	µg/L	0.22	2	0.000081	0.000081
Chromium	µg/L	NA	100	100	100
DDD	µg/L	0.031	NA	0.000031	0.000031
DDE	µg/L	0.23	NA	0.000031	0.000031
DDT	µg/L	0.23	NA	0.000022	0.000022
Hexachlorobenzene	µg/L	0.49	1	0.000029	0.000029
MCPP	µg/L	16	NA	NA	16
Pentachlorophenol	µg/L	0.04	1	0.15	0.15
PCBs	µg/L	0.039	0.5	0.0000064	0.0000064
cPAHs (BaP Eq)	µg/L	0.0034	0.2	0.0013	0.0013
Benzo(a)anthracene	µg/L	0.034	NA	0.0013	0.0013
Benzo(a)pyrene	µg/L	0.0034	0.2	0.0013	0.0013
Benzo(b)fluoranthene	µg/L	0.034	NA	0.0013	0.0013
Benzo(k)fluoranthene	µg/L	0.34	NA	0.0013	0.0013
Chrysene	µg/L	3.4	NA	0.0013	0.0013
Dibenz(a,h)anthracene	µg/L	0.0034	NA	0.0013	0.0013
Indeno(1,2,3-c,d)pyrene	µg/L	0.034	NA	0.0013	0.0013
Dioxins/Furans (2,3,7,8-TCDD Eq)	µg/L	0.0000006	0.00003	0.0000000005	0.0000000005

Notes:
NA - Not available

Table 2.2-7
RAO 4 PRG Derivation
Portland Harbor Superfund Site
Portland, Oregon

Contaminant	RAO 4 Reduce migrati acceptable in s Units
Arsenic	µg/L
Benzene	µg/L
Chlorobenzene	µg/L
Chromium	µg/L
Copper	µg/L
Cyanide	µg/L
DDD	µg/L
DDE	µg/L
DDT	µg/L
1,1-DCE	µg/L
cis-1,2-DCE	µg/L
2,4-D	µg/L
Ethylbenzene	µg/L
Manganese	µg/L
Pentachlorophenol	µg/L
Perchlorate	µg/L
cPAHs (BaP Eq)	µg/L
Benzo(a)anthracene	µg/L
Benzo(a)pyrene	µg/L
Benzo(b)fluoranthene	µg/L
Benzo(k)fluoranthene	µg/L
Chrysene	µg/L
Dibenz(a,h)anthracene	µg/L
Indeno(1,2,3-c,d)pyrene	µg/L
PCE	µg/L
Toluene	µg/L
TCE	µg/L
2,4,5-TP	µg/L
Vinyl chloride	µg/L
Xylenes	µg/L

Notes:
NA - Not available

ion of COCs in groundwater to sediment and surface water such that levels are
ediment and surface water for human exposure.

Groundwater			
Risk (RSL 10^{-6})	MCL	ARAR (AWQC)	PRG
0.05	10	0.018	0.018
0.5	5	0.44	0.44
78	100	74	74
NA	100	100	100
800	1,300	1,300	1300
1.5	200	130	130
0.031	NA	0.00003	0.00003
0.23	NA	0.00003	0.00003
0.23	NA	0.00002	0.00002
280	7	230	7
36	70	0.38	0.38
170	70	NA	70
1.5	700	160	160
430	NA	50	50
0.04	1.0	0.15	0.15
14	15	NA	15
0.0034	0.2	0.0013	0.0013
0.03	NA	0.0013	0.0013
0.00	0.2	0.0013	0.0013
0.03	NA	0.0013	0.0013
0.34	NA	0.0013	0.0013
3.40	NA	0.0013	0.0013
0.00	NA	0.0013	0.0013
0.03	NA	0.0013	0.0013
11	5	0.24	0.24
1,100	1,000	720	720
0.49	5	1.4	1.4
110	50	NA	50
0.019	2.0	0.023	0.023
190	10,000	NA	10000

Table 2.2-8
RAO 5 PRG Derivation
Portland Harbor Superfund Site
Portland, Oregon

Contaminant	RAO 5 Reduce risk to e riverbank soils t Units
BEHP	µg/kg
Cadmium	mg/kg
Chlordanes	µg/kg
Copper	mg/kg
DDx	µg/kg
DDE	µg/kg
Dieldrin	µg/kg
Lindane	µg/kg
Lead	mg/kg
Mercury	mg/kg
PCBs	µg/kg
PAHs	µg/kg
TBT	mg/kg
Zinc	mg/kg

Notes:
NA - Not available

ecological receptors from ingestions of and direct contact with COCs in sediment and to acceptable exposure levels.

Sediment			
Risk-based PRG (HQ=1)	ARAR	Background	PRG
135	NA	61	135
5	NA	0.12	5
18	NA	0.4	18
149	NA	26	149
63	NA	3	63
31	NA		31
62	NA		62
5	NA		5
128	NA	7.7	128
1.1	NA	0.034	1.1
64	NA	9	64
23,000	NA	73	23,000
24	NA		24
459	NA	77	459

Table 2.2-9
RAO 6 PRG Derivation
Portland Harbor Superfund Site
Portland, Oregon

Contaminant	RAO 6 Reduce risks to ecological receptor exposure levels.	
	Units	Risk-based PRG (HQ=1)
Copper	mg/kg	
DDx	µg/kg	2,849
4,4´-DDE	µg/kg	2.8
DDE	µg/kg	144
Mercury	mg/kg	NA
PCBs	µg/kg	36
PAHs	µg/kg	
1,2,3,4,7,8-HxCDF	µg/kg	0.03
1,2,3,7,8-PeCDD	µg/kg	0.001
2,3,4,7,8-PeCDF	µg/kg	0.004
2,3,7,8-TCDD	µg/kg	0.0008
2,3,7,8-TCDF	µg/kg	0.004
Tributyltin	mg/kg	

Notes:
NA - Not available.

·s that consume COCs in prey to acceptable

Sediment		
ARAR	**Background**	**PRG**
NA	26	
NA	2	2,849
NA		2.8
		144
NA	0.034	NA
NA	9	36
NA	73	
NA		0.03
NA	0.00013	0.001
NA	0.00019	0.004
NA	0.00014	0.0008
NA	0.00021	0.004
NA		

Table 2.2-10
RAO 7 PRG Derivation
Portland Harbor Superfund Site
Portland, Oregon

Contaminant	RAO 7 Reduce risks to ecolog surface water to acce Units
BEHP	µg/L
Copper	µg/L
DDx	µg/L
Ethylbenzene	µg/L
PCBs	µg/L
PAHs	
Benzo(a)anthracene	µg/L
Benzo(a)pyrene	µg/L
Naphthalene	µg/L
TBT	µg/L
Zinc	µg/L

Notes:

NA - Not available

1 - ARAR is more conservative but TRV was selected because of the receptor assumptions in the value.

2 - This value is for the dissolved fraction.

gical receptors from ingestion of and direct contact COCs in
ptable exposure levels.

Surface Water		
Risk TRV from BERA	**ARAR (AWQC)**	**PRG**
3	NA	3
2.74	4	2.74
0.011	0.001	0.011[1]
7.3	NA	7.3
0.19	0.014	0.19[1]
0.027	NA	0.027
0.014	NA	0.014
12	NA	12
NA	0.063	0.063
36.5	35	36.5[2,3]

Table 2.2-11
RAO 8 PRG Derivation
Portland Harbor Superfund Site
Portland, Oregon

Contaminant	RAO 8 Reduce migration of C levels are acceptable Units
Arsenic	µg/L
Benzene	µg/L
Cadmium	µg/L
Chlorobenzene	µg/L
Chromium	µg/L
Copper	µg/L
Cyanide	µg/L
DDx	µg/L
DDT	µg/L
1,1-DCE	µg/L
cis-1,2-DCE	µg/L
Ethylbenzene	µg/L
Lead	µg/L
Manganese	µg/L
Perchlorate	µg/L
PCBs	µg/L
PAHs	µg/L
Acenaphthene	µg/L
Acenaphthylene	µg/L
Anthracene	µg/L
Benzo(a)anthracene	µg/L
Benzo(a)pyrene	µg/L
Benzo(b)fluoranthene	µg/L
Benzo(g,h,i)perylene	µg/L
Benzo(k)fluoranthene	µg/L
Chrysene	µg/L
Dibenz(a,h)anthracene	µg/L
Fluoranthene	µg/L
Fluorene	µg/L
Indeno(1,2,3-c,d)pyrene	µg/L
2-Methylnaphthalene	µg/L
Naphthalene	µg/L
Phenanthrene	µg/L
Pyrene	µg/L
Toluene	µg/L

TPH C10-C12 aliphatic	µg/L
TCE	µg/L
Vanadium	µg/L
Vinyl chloride	µg/L
Xylenes	µg/L
Zinc	µg/L

Notes:

NA - Not available

1 - Criterion is expressed in terms of “dissolved” concentrations in the water column.

2 - Criterion is applied as hexavalent chromium.

3 - This criterion is expressed as µg free cyanide (CN)/L.

4 - This criterion is based on evaluation in Attachment 1 to Appendix B.

COCs in groundwater to sediment and surface water such that
in sediment and surface water for ecological exposure.

Pore Water		
TRV from BERA	ARAR	PRG
	150	150
130	NA	130
0.09[1]	0.094	0.09[1]
64	NA	64
	11[1,2]	11[1,2]
2.74[1]	4	2.74[1]
5.2	5.2	5.2
0.011	0.001	0.001
0.001	NA	0.001
25	NA	25
590	NA	590
7.3	NA	7.3
0.54	0.54	0.54
120	1,433[4]	1,433[4]
9,300	NA	9,300
0.014	0.014	0.014
	NA	
23	NA	23
	NA	
0.73	NA	0.73
0.027	NA	0.027
0.014	NA	0.014
0.68	NA	0.68
0.44	NA	0.44
0.64	NA	0.64
2.0	NA	2
0.28	NA	0.28
6.2	NA	6.2
3.9	NA	3.9
0.28	NA	0.28
2.1	NA	2.1
12	NA	12
6.3	NA	6.3
10	NA	10
9.8	NA	9.8

2.6	NA	2.6
47	NA	47
20	NA	20
	NA	
13	NA	13
36.5	NA	36.5

Table 2.2-12
RAO 9 PRG Derivation
Portland Harbor Superfund Site
Portland, Oregon

Contaminant	Units	RAO 9 Reduce migration of COCs in river banks to sediment and surface wat for human health and ecological exposures. Sedim RAO 1 Beach PRG	RAO 1 Sediment PRG	RAO 2 Sediment PRG
Aldrin	µg/kg			2
Arsenic	mg/kg	3	3	
BEHP	µg/kg			
Cadmium	mg/kg			
Chlordanes	µg/kg			1.5
Copper	mg/kg			
DDx	µg/kg			6.1
Dieldrin	µg/kg			0.07
Hexachlorobenzene	µg/kg			0.3
Lindane	µg/kg			
Lead	mg/kg			
Mercury	mg/kg			
PCBs	µg/kg		370	9
PAHs	µg/kg			
cPAHs (BaP Eq)	µg/kg	12	106	3,950
1,2,3,4,7,8-HxCDF	µg/kg			0.000002
1,2,3,7,8-PeCDD	µg/kg			0.0001
2,3,4,7,8-PeCDF	µg/kg			0.0002
2,3,7,8-TCDD	µg/kg		0.01	0.0001
2,3,7,8-TCDF	µg/kg			0.0004
TBT	mg/kg			
Zinc	mg/kg			

Notes:
NA - Not applicable
BaP Eq - benzo(a)pyrene equivalent

ter such that levels are acceptable in sediment and surface water

ent

RAO 5 Sediment PRG	RAO 6 Sediment PRG	Background	PRG
			2
		3	3
135		61	135
5			5
18		0.6	1.5
149		26	149
63	2,849	3	6.1
62			0.07
		0.3	0.3
5			5
128			128
1.1	NA	0.034	1.1
64	36	9	9
23,000		73	23,000
		12	12
	0.03		0.000002
	0.001	0.0001	0.0001
	0.004	0.0002	0.0002
	0.0008	0.0001	0.0001
	0.004	0.0002	0.0004
24			24
459		77	459