Table 1. Human Health Sediment PRGs for Direct Exposure to Sediment

Chemical	Exposure Route: / Receptor: / Target Risk Level	Units of PRGs	Beach Sediment (Direct Contact)							In-Water Sediment (Direct Contact)					
			Dockside Worker	Transient	Adult Recreational Beach User	Child Recreational Beach User	High Frequency Fisher	Low Frequency Fisher	Tribal Fisher	In-water Worker	Low Frequency Fisher	High Frequency Fisher	Tribal Fisher	Diver in Wet Suit	Diver in Dry Suit
Metals															
Arsenic	10^{-6} Risk	mg/kg dw			2.8E+00	9.5E-01	1.7E+00	2.5E+00	4.3E-01			1.5E+01	3.9E+00		
Arsenic	10^{-5} Risk	mg/kg dw			2.8E+01	9.5E+00	1.7E+01	2.5E+01	4.3E+00			1.5E+02	3.9E+01		
Arsenic	10^{-4} Risk	mg/kg dw			2.8E+02	9.5E+01	1.7E+02	2.5E+02	4.3E+01			1.5E+03	3.9E+02		
Arsenic	HQ = 1	mg/kg dw			5.4E+02	3.7E+01	3.2E+02	4.9E+02	1.9E+02			2.9E+03	1.7E+03		
PAHs															
Benzo(a)anthracene	10^{-6} Risk	mg/kg dw	6.9E+00								2.5E+01	1.6E+01	4.2E+00	2.6E+01	
Benzo(a)anthracene	10^{-5} Risk	mg/kg dw	6.9E+01								2.5E+02	1.6E+02	4.2E+01	2.6E+02	
Benzo(a)anthracene	10^{-4} Risk	mg/kg dw	6.9E+02								2.5E+03	1.6E+03	4.2E+02	2.6E+03	
Benzo(a)anthracene	HQ = 1	mg/kg dw													
Benzo(a)pyrene	10^{-6} Risk	mg/kg dw	6.9E-01			6.6E-02	1.6E-01		4.2E-02	8.6E+00	2.5E+00	1.6E+00	4.2E-01	2.6E+00	1.3E+01
Benzo(a)pyrene	10^{-5} Risk	mg/kg dw	6.9E+00			6.6E-01	1.6E+00		4.2E-01	8.6E+01	2.5E+01	1.6E+01	4.2E+00	2.6E+01	1.3E+02
Benzo(a)pyrene	10^{-4} Risk	mg/kg dw	6.9E+01			6.6E+00	1.6E+01		4.2E+00	8.6E+02	2.5E+02	1.6E+02	4.2E+01	2.6E+02	1.3E+03
Benzo(a)pyrene	HQ = 1	mg/kg dw													
Benzo(b)fluoranthene	10^{-6} Risk	mg/kg dw	6.9E+00								2.5E+01	1.6E+01	4.2E+00	2.6E+01	
Benzo(b)fluoranthene	10^{-5} Risk	mg/kg dw	6.9E+01								2.5E+02	1.6E+02	4.2E+01	2.6E+02	
Benzo(b)fluoranthene	10^{-4} Risk	mg/kg dw	6.9E+02								2.5E+03	1.6E+03	4.2E+02	2.6E+03	
Benzo(b)fluoranthene	HQ = 1	mg/kg dw													
Dibenzo(a,h)anthracene	10^{-6} Risk	mg/kg dw	6.9E-01								2.5E+00	1.6E+00	4.2E-01	2.6E+00	
Dibenzo(a,h)anthracene	10^{-5} Risk	mg/kg dw	6.9E+00								2.5E+01	1.6E+01	4.2E+00	2.6E+01	
Dibenzo(a,h)anthracene	10^{-4} Risk	mg/kg dw	6.9E+01								2.5E+02	1.6E+02	4.2E+01	2.6E+02	
Dibenzo(a,h)anthracene	HQ = 1	mg/kg dw													
Indeno(1,2,3-cd)pyrene	10^{-6} Risk	mg/kg dw	6.9E+00								2.5E+01	1.6E+01	4.2E+00	2.6E+01	
Indeno(1,2,3-cd)pyrene	10^{-5} Risk	mg/kg dw	6.9E+01								2.5E+02	1.6E+02	4.2E+01	2.6E+02	
Indeno(1,2,3-cd)pyrene	10^{-4} Risk	mg/kg dw	6.9E+02								2.5E+03	1.6E+03	4.2E+02	2.6E+03	
Indeno(1,2,3-cd)pyrene	HQ = 1	mg/kg dw													
Total cPAH	10^{-6} Risk	mg/kg dw	6.9E-01		2.7E-01	6.6E-02	1.6E-01	2.4E-01	4.2E-02	8.6E+00	2.5E+00	1.6E+00	4.2E-01	2.6E+00	1.3E+01
Total cPAH	10^{-5} Risk	mg/kg dw	6.9E+00		2.7E+00	6.6E-01	1.6E+00	2.4E+00	4.2E-01	8.6E+01	2.5E+01	1.6E+01	4.2E+00	2.6E+01	1.3E+02
Total cPAH	10^{-4} Risk	mg/kg dw	6.9E+01		2.7E+01	6.6E+00	1.6E+01	2.4E+01	4.2E+00	8.6E+02	2.5E+02	1.6E+02	4.2E+01	2.6E+02	1.3E+03
Total cPAH	HQ = 1	mg/kg dw													
PCBs															
Total PCBs	10^{-6} Risk	mg/kg dw									8.6E+00	5.7E+00	1.5E+00	8.8E+00	
Total PCBs	10^{-5} Risk	mg/kg dw									8.6E+01	5.7E+01	1.5E+01	8.8E+01	
Total PCBs	10^{-4} Risk	mg/kg dw									8.6E+02	5.7E+02	1.5E+02	8.8E+02	
Total PCBs	HQ = 1	mg/kg dw									1.5E+02	9.8E+01	5.9E+01	1.3E+02	
Total PCB TEQ	10^{-6} Risk	mg/kg dw										8.8E-05	2.3E-05		
Total PCB TEQ	10^{-5} Risk	mg/kg dw										8.8E-04	2.3E-04		
Total PCB TEQ	10^{-4} Risk	mg/kg dw										8.8E-03	2.3E-03		
Total PCB TEQ	HQ = 1	mg/kg dw										4.9E-03	3.0E-03		
Dioxin/Furans															
Total Dioxin TEQ	10^{-6} Risk	mg/kg dw								6.3E-04	2.6E-04	1.7E-04	4.5E-05	5.2E-04	1.5E-03
Total Dioxin TEQ	10^{-5} Risk	mg/kg dw								6.3E-03	2.6E-03	1.7E-03	4.5E-04	5.2E-03	1.5E-02
Total Dioxin TEQ	10^{-4} Risk	mg/kg dw								6.3E-02	2.6E-02	1.7E-02	4.5E-03	5.2E-02	1.5E-01
Total Dioxin TEQ	HQ = 1	mg/kg dw								1.2E-02	1.4E-02	9.7E-03	5.8E-03	2.4E-02	7.0E-02

Notes:
COC = chemical of concern
HQ = hazard quotient
PRG = preliminary remediation goal
mg/kg dw = milligrams per kilogram on a dry weight basis

PRG not developed because analyte is not evaluated for the non-cancer endpoint.
PRG not developed because analyte is not a chemical of concern for this scenario.

Table 2. Human Health Sediment PRGs for Fish and Shellfish Consumption[a]

Chemical	Exposure Route:		Fish Consumption																Shellfish Consumption			
	Receptor:		Adult Fish Consumption, Single Species Diet - Large Home-Range Resident Fish				Adult Fish Consumption, Single Species Diet - Smallmouth Bass		Child Fish Consumption, Single Species Diet - Large Home-Range Resident Fish				Child Fish Consumption, Single Species Diet - Smallmouth Bass		Tribal Adult Fish Consumption, Multi-species Diet[b]		Tribal Child Fish Consumption, Multi-species Diet[c]		Adult Shellfish Consumption - Clam		Adult Shellfish Consumption - Crayfish	
	Ingestion Rate (g/day):		17.5		142		17.5	142	7		60		7	60	86.8[c]		36.2[c]		3.3	18	3.3	18
Chemical	Target Risk Level	Units of PRGs	Low Bioaccum	High Bioaccum	Low Bioaccum	High Bioaccum			Low Bioaccum	High Bioaccum	Low Bioaccum	High Bioaccum			Low Bioaccum	High Bioaccum	Low Bioaccum	High Bioaccum				
Metals																						
Antimony	10^{-6} Risk	mg/kg dw																				
Antimony	10^{-5} Risk	mg/kg dw																				
Antimony	10^{-4} Risk	mg/kg dw																				
Antimony[d]	HQ = 1	mg/kg dw					NC	NC					NC	NC	NC	NC	NC	NC				
Arsenic	10^{-6} Risk	mg/kg dw	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Arsenic	10^{-5} Risk	mg/kg dw	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Arsenic	10^{-4} Risk	mg/kg dw	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Arsenic	HQ = 1	mg/kg dw	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Lead[d]	5% prob - 10 ug/dl	mg/kg dw	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC				
Mercury	10^{-6} Risk	mg/kg dw																				
Mercury	10^{-5} Risk	mg/kg dw																				
Mercury	10^{-4} Risk	mg/kg dw																				
Mercury	HQ = 1	mg/kg dw	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC				
Selenium	10^{-6} Risk	mg/kg dw																				
Selenium	10^{-5} Risk	mg/kg dw																				
Selenium	10^{-4} Risk	mg/kg dw																				
Selenium	HQ = 1	mg/kg dw					NC	NC					NC	NC								
Zinc	10^{-6} Risk	mg/kg dw																				
Zinc	10^{-5} Risk	mg/kg dw																				
Zinc	10^{-4} Risk	mg/kg dw																				
Zinc	HQ = 1	mg/kg dw							NC	NC	NC	NC										
PAHs[e, f]																						
Benzo(a)anthracene	10^{-6} Risk	mg/kg-OC					NC	NC											1.4E+01	8.1E-01	NC	NC
Benzo(a)anthracene	10^{-5} Risk	mg/kg-OC					NC	NC											7.3E+02	4.1E+01	NC	NC
Benzo(a)anthracene	10^{-4} Risk	mg/kg-OC					NC	NC											3.7E+04	2.0E+03	NC	NC
Benzo(a)anthracene	HQ = 1	mg/kg-OC																				
Benzo(a)pyrene	10^{-6} Risk	mg/kg-OC	NC	NC	NC	NC	NC	NC					NC	NC	NC	NC			2.2E+00	1.3E-01	2.2E+02	4.0E+01
Benzo(a)pyrene[g]	10^{-5} Risk	mg/kg-OC	NC	NC	NC	NC	NC	NC					NC	NC	NC	NC			1.0E+02	5.9E+00	2.3E+03	4.1E+02
Benzo(a)pyrene[g]	10^{-4} Risk	mg/kg-OC	NC	NC	NC	NC	NC	NC					NC	NC	NC	NC			4.7E+03	2.8E+02	2.4E+04	4.3E+03
Benzo(a)pyrene	HQ = 1	mg/kg-OC																				
Benzo(b)fluoranthene	10^{-6} Risk	mg/kg-OC																	NC	NC	NC	NC
Benzo(b)fluoranthene	10^{-5} Risk	mg/kg-OC																	NC	NC	NC	NC
Benzo(b)fluoranthene	10^{-4} Risk	mg/kg-OC																	NC	NC	NC	NC
Benzo(b)fluoranthene	HQ = 1	mg/kg-OC																				
Benzo(k)fluoranthene[h]	10^{-6} Risk	mg/kg-OC																	1.6E+03	1.5E+02	NC	NC
Benzo(k)fluoranthene[h]	10^{-5} Risk	mg/kg-OC																	4.2E+04	3.8E+03	NC	NC
Benzo(k)fluoranthene[h]	10^{-4} Risk	mg/kg-OC																	1.1E+06	1.0E+05	NC	NC
Benzo(k)fluoranthene	HQ = 1	mg/kg-OC																				
Dibenzo(a,h)anthracene	10^{-6} Risk	mg/kg-OC	NC	NC	NC	NC	NC	NC											NC	NC	NC	NC
Dibenzo(a,h)anthracene	10^{-5} Risk	mg/kg-OC	NC	NC	NC	NC	NC	NC											NC	NC	NC	NC
Dibenzo(a,h)anthracene	10^{-4} Risk	mg/kg-OC	NC	NC	NC	NC	NC	NC											NC	NC	NC	NC
Dibenzo(a,h)anthracene	HQ = 1	mg/kg-OC																				
Indeno(1,2,3-cd)pyrene	10^{-6} Risk	mg/kg-OC																	NC	NC	NC	NC
Indeno(1,2,3-cd)pyrene	10^{-5} Risk	mg/kg-OC																	NC	NC	NC	NC
Indeno(1,2,3-cd)pyrene	10^{-4} Risk	mg/kg-OC																	NC	NC	NC	NC
Indeno(1,2,3-cd)pyrene	HQ = 1	mg/kg-OC																				
Phalates and SVOCs																						
Bis(2-ethylhexyl)phthalate	10^{-6} Risk	mg/kg-OC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC				
Bis(2-ethylhexyl)phthalate	10^{-5} Risk	mg/kg-OC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC				
Bis(2-ethylhexyl)phthalate	10^{-4} Risk	mg/kg-OC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC				
Bis(2-ethylhexyl)phthalate	HQ = 1	mg/kg-OC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC				
Hexachlorobenzene	10^{-6} Risk	mg/kg-OC	3.7E-01	1.2E-01	4.6E-02	1.5E-02	NC	NC	1.0E+00	3.2E-01	1.2E-01	3.8E-02	NC	NC	3.2E-02	1.0E-02	1.9E-01	6.2E-02				
Hexachlorobenzene	10^{-5} Risk	mg/kg-OC	3.7E+00	1.2E+00	4.6E-01	1.5E-01	NC	NC	1.0E+01	3.2E+00	1.2E+00	3.8E-01	NC	NC	3.2E-01	1.0E-01	1.9E+00	6.2E-01				
Hexachlorobenzene	10^{-4} Risk	mg/kg-OC	3.7E+01	1.2E+01	4.6E+00	1.5E+00	NC	NC	1.0E+02	3.2E+01	1.2E+01	3.8E+00	NC	NC	3.2E+00	1.0E+00	1.9E+01	6.2E+00				
Hexachlorobenzene	HQ = 1	mg/kg-OC	2.0E+02	6.6E+01	2.5E+01	8.1E+00	NC	NC	1.1E+02	3.5E+01	1.3E+01	4.1E+00	NC	NC	4.1E+01	1.3E+01	2.1E+01	6.8E+00				
Pentachlorophenol	10^{-6} Risk	mg/kg-OC																			NC	NC
Pentachlorophenol	10^{-5} Risk	mg/kg-OC																			NC	NC
Pentachlorophenol	10^{-4} Risk	mg/kg-OC																			NC	NC
Pentachlorophenol	HQ = 1	mg/kg-OC																			NC	NC
PCBs																						
PCB-126[i]	10^{-6} Risk	mg/kg dw	<0	<0	<0	<0	<0	<0	6.0E-07	2.4E-07	<0	<0	<0	<0	<0	<0	<0	<0	3.4E-06	<0	1.2E-06	<0
PCB-126[i]	10^{-5} Risk	mg/kg dw	3.3E-06	3.1E-06	<0	<0	4.1E-07	<0	1.0E-05	7.5E-06	7.8E-07	4.2E-07	2.6E-06	<0	<0	<0	2.5E-07	2.5E-07	4.5E-05	7.2E-06	1.9E-05	2.9E-06
PCB-126[i]	10^{-4} Risk	mg/kg dw	4.2E-05	2.2E-05	4.3E-06	3.8E-06	1.2E-05	7.0E-07	1.2E-04	4.9E-05	1.2E-05	8.6E-06	3.6E-05	3.2E-06	1.0E-06	1.0E-06	1.1E-05	1.1E-05	4.8E-04	8.5E-05	1.8E-04	3.4E-05
PCB-126[i]	HQ = 1	mg/kg dw	2.3E-05	1.4E-05	2.1E-06	2.0E-06	6.4E-06	1.7E-08	1.2E-05	8.3E-06	9.1E-07	5.7E-07	3.0E-06	<0	1.6E-06	1.6E-06	3.8E-07	3.8E-07	2.6E-04	4.6E-05	1.0E-04	1.9E-05
Total PCBs	10^{-6} Risk	mg/kg dw	<0	<0	<0	<0	<0	<0	<0	<0	<0	<0	<0	<0	<0	<0	<0	<0	4.4E-02	3.0E-03	2.2E-02	<0
Total PCBs	10^{-5} Risk	mg/kg dw	9.2E-03	1.3E-03	<0	<0	<0	<0	3.2E-02	1.2E-02	<0	<0	4.4E-03	<0	<0	<0	<0	<0	4.9E-01	8.6E-02	2.8E-01	4.6E-02
Total PCBs	10^{-4} Risk	mg/kg dw	1.3E-01	6.0E-02	1.2E-02	2.8E-03	3.0E-02	<0	3.7E-01	1.7E-01	3.9E-02	1.5E-02	8.7E-02	5.9E-03	3.8E-04	3.8E-04	2.7E-02	2.7E-02	5.0E+00	9.1E-01	2.8E+00	5.1E-01
Total PCBs	HQ = 1	mg/kg dw	1.9E-02	6.0E-03	<0	<0	1.1E-03	<0	8.0E-03	8.0E-04	<0	<0	<0	<0	<0	<0	<0	<0	8.5E-01	1.5E-01	4.8E-01	8.3E-02
Dioxin/Furans																						
2,3,4,7,8 PCDF[j]	10^{-6} Risk	mg/kg dw	<0	<0	<0	<0	<0	<0	6.5E-09	<0	<0	<0	1.1E-07	<0	<0	<0	<0	<0	2.4E-06	1.3E-07	2.0E-06	8.0E-08

Chemical	Exposure Route:		Fish Consumption																Shellfish Consumption			
	Receptor:		Adult Fish Consumption, Single Species Diet - Large Home-Range Resident Fish				Adult Fish Consumption, Single Species Diet - Smallmouth Bass		Child Fish Consumption, Single Species Diet - Large Home-Range Resident Fish				Child Fish Consumption, Single Species Diet - Smallmouth Bass		Tribal Adult Fish Consumption, Multi-species Diet[b]		Tribal Child Fish Consumption, Multi-species Diet[c]		Adult Shellfish Consumption - Clam		Adult Shellfish Consumption - Crayfish	
	Ingestion Rate (g/day):		17.5		142		17.5	142	7		60		7	60	86.8[c]		36.2[c]		3.3	18	3.3	18
Chemical	Target Risk Level	Units of PRGs	Low Bioaccum	High Bioaccum	Low Bioaccum	High Bioaccum			Low Bioaccum	High Bioaccum	Low Bioaccum	High Bioaccum			Low Bioaccum	High Bioaccum	Low Bioaccum	High Bioaccum				
2,3,4,7,8 PCDF[j]	10^{-5} Risk	mg/kg dw	5.4E-07	2.5E-07	<0	<0	1.1E-06	<0	2.4E-06	2.2E-06	3.3E-08	<0	3.9E-06	1.5E-07	<0	<0	4.0E-07	4.0E-07	4.8E-05	5.4E-06	3.7E-05	4.5E-06
2,3,4,7,8 PCDF[j]	10^{-4} Risk	mg/kg dw	2.8E-05	1.2E-05	7.4E-07	4.5E-07	2.0E-05	1.4E-06	1.7E-04	4.2E-05	3.2E-06	2.6E-06	7.0E-05	4.8E-06	8.8E-07	8.8E-07	9.2E-06	9.2E-06	9.1E-04	1.1E-04	6.2E-04	7.8E-05
2,3,4,7,8 PCDF[j]	HQ = 1	mg/kg dw	9.5E-06	5.6E-06	2.9E-07	4.9E-08	9.9E-06	6.2E-07	2.9E-06	2.5E-06	5.5E-08	<0	4.5E-06	1.9E-07	1.3E-06	1.3E-06	4.8E-07	4.8E-07	4.3E-04	5.0E-05	3.0E-04	3.8E-05
Pesticides																						
Aldrin	10^{-6} Risk	mg/kg dw	6.9E-03	1.4E-03	8.4E-04	1.7E-04													1.2E-02	2.3E-03	3.5E-02	6.5E-03
Aldrin	10^{-5} Risk	mg/kg dw	7.0E-02	1.4E-02	8.6E-03	1.8E-03													1.2E-01	2.3E-02	3.5E-01	6.5E-02
Aldrin	10^{-4} Risk	mg/kg dw	7.0E-01	1.4E-01	8.6E-02	1.8E-02													1.2E+00	2.3E-01	3.5E+00	6.5E-01
Aldrin	HQ = 1	mg/kg dw	1.5E+00	3.1E-01	1.9E-01	3.8E-02													2.7E+00	5.0E-01	7.7E+00	1.4E+00
Dieldrin	10^{-6} Risk	mg/kg dw	<0	<0	<0	<0	<0	<0	9.3E-04	<0	<0	<0	<0	<0	<0	<0	<0	<0	1.0E-02	7.7E-04	1.6E-02	1.4E-03
Dieldrin	10^{-5} Risk	mg/kg dw	7.2E-03	2.5E-03	<0	<0	3.5E-03	<0	2.2E-02	1.0E-02	1.3E-03	<0	1.3E-02	<0	<0	<0	1.1E-03	1.1E-03	1.1E-01	1.9E-02	1.8E-01	3.1E-02
Dieldrin	10^{-4} Risk	mg/kg dw	8.4E-02	4.3E-02	9.2E-03	3.6E-03	5.2E-02	4.8E-03	2.3E-01	1.2E-01	2.5E-02	1.2E-02	1.4E-01	1.5E-02	3.1E-03	3.1E-03	2.8E-02	2.8E-02	1.1E+00	2.0E-01	1.8E+00	3.3E-01
Dieldrin	HQ = 1	mg/kg dw	2.9E-01	1.5E-01	3.5E-02	1.7E-02	1.8E-01	2.1E-02	1.6E-01	8.1E-02	1.7E-02	7.7E-03	9.7E-02	9.7E-03	3.8E-02	3.8E-02	1.8E-02	1.8E-02	3.9E+00	7.1E-01	6.2E+00	1.1E+00
Heptachlor Epoxide	10^{-6} Risk	mg/kg dw	3.0E-03	2.2E-03	2.4E-04	1.5E-04																
Heptachlor Epoxide	10^{-5} Risk	mg/kg dw	3.1E-02	2.3E-02	3.7E-03	2.7E-03																
Heptachlor Epoxide	10^{-4} Risk	mg/kg dw	3.1E-01	2.3E-01	3.8E-02	2.8E-02																
Heptachlor Epoxide	HQ = 1	mg/kg dw	1.6E-01	1.2E-01	1.9E-02	1.4E-02																
Total Chlordane	10^{-6} Risk	mg/kg dw	2.1E-02	8.5E-03	1.9E-03	1.5E-04	7.4E-03	5.6E-05	5.9E-02	2.4E-02	6.1E-03	1.9E-03	2.1E-02	1.6E-03	<0	<0	4.9E-03	4.9E-03				
Total Chlordane	10^{-5} Risk	mg/kg dw	2.2E-01	9.4E-02	2.7E-02	1.1E-02	8.3E-02	9.3E-03	5.9E-01	2.5E-01	6.9E-02	2.9E-02	2.2E-01	2.5E-02	8.8E-03	8.8E-03	5.8E-02	5.8E-02				
Total Chlordane	10^{-4} Risk	mg/kg dw	2.2E+00	9.5E-01	2.7E-01	1.2E-01	8.3E-01	1.0E-01	5.9E+00	2.5E+00	6.9E-01	3.0E-01	2.2E+00	2.6E-01	9.7E-02	9.7E-02	5.8E-01	5.8E-01				
Total Chlordane	HQ = 1	mg/kg dw	1.7E+00	7.1E-01	2.0E-01	8.7E-02	6.3E-01	7.6E-02	8.9E-01	3.8E-01	1.0E-01	4.4E-02	3.3E-01	3.8E-02	1.7E-01	1.7E-01	8.7E-02	8.7E-02				
Sum DDD	10^{-6} Risk	mg/kg dw	2.6E-02	1.0E-02	2.4E-03	3.9E-04	8.1E-03	1.6E-04	7.1E-02	2.9E-02	7.5E-03	2.5E-03	2.3E-02	1.9E-03	1.6E-04	1.6E-04	5.8E-03	5.8E-03	5.8E-01	1.1E-01	5.4E-01	9.7E-02
Sum DDD	10^{-5} Risk	mg/kg dw	2.7E-01	1.1E-01	3.2E-02	1.3E-02	8.9E-02	1.0E-02	7.2E-01	3.0E-01	8.3E-02	3.5E-02	2.4E-01	2.7E-02	1.0E-02	1.0E-02	6.7E-02	6.7E-02	5.8E+00	1.1E+00	5.4E+00	9.8E-01
Sum DDD	10^{-4} Risk	mg/kg dw	2.7E+00	1.1E+00	3.3E-01	1.4E-01	9.0E-01	1.1E-01	7.2E+00	3.0E+00	8.4E-01	3.5E-01	2.4E+00	2.8E-01	1.1E-01	1.1E-01	6.8E-01	6.8E-01	5.8E+01	1.1E+01	5.4E+01	9.8E+00
Sum DDD	HQ = 1	mg/kg dw	1.4E+00	5.8E-01	1.7E-01	7.1E-02	4.6E-01	5.6E-02	7.4E-01	3.1E-01	8.5E-02	3.6E-02	2.5E-01	2.8E-02	1.3E-01	1.3E-01	6.9E-02	6.9E-02	3.0E+01	5.5E+00	2.8E+01	5.1E+00
Sum DDE	10^{-6} Risk	mg/kg dw	3.0E-03	7.4E-04	<0	<0	<0	<0	1.1E-02	5.0E-03	<0	<0	1.1E-03	<0	<0	<0	<0	<0	2.2E-01	3.9E-02	9.4E-02	1.6E-02
Sum DDE	10^{-5} Risk	mg/kg dw	4.5E-02	2.3E-02	4.1E-03	1.3E-03	8.8E-03	<0	1.2E-01	6.6E-02	1.3E-02	6.1E-03	2.6E-02	1.6E-03	8.2E-05	8.2E-05	9.1E-03	9.1E-03	2.2E+00	4.1E-01	9.6E-01	1.7E-01
Sum DDE	10^{-4} Risk	mg/kg dw	4.7E-01	2.5E-01	5.6E-02	2.9E-02	1.0E-01	1.1E-02	1.2E+00	6.7E-01	1.4E-01	7.7E-02	2.8E-01	3.1E-02	1.6E-02	1.6E-02	1.1E-01	1.1E-01	2.3E+01	4.1E+00	9.6E+00	1.8E+00
Sum DDE	HQ = 1	mg/kg dw	3.4E-01	1.8E-01	4.0E-02	2.1E-02	7.4E-02	7.7E-03	1.8E-01	9.6E-02	2.0E-02	9.7E-03	3.9E-02	3.1E-03	2.9E-02	2.9E-02	1.4E-02	1.4E-02	1.6E+01	3.0E+00	7.0E+00	1.3E+00
Sum DDT	10^{-6} Risk	mg/kg dw	3.0E-02	1.8E-02	2.4E-03	1.1E-03	1.1E-02	1.1E-04	8.2E-02	5.0E-02	8.2E-03	4.7E-03	3.1E-02	2.4E-03	3.0E-04	3.0E-04	8.8E-03	8.8E-03	3.3E-01	5.9E-02	2.2E-01	3.9E-02
Sum DDT	10^{-5} Risk	mg/kg dw	3.1E-01	1.9E-01	3.7E-02	2.2E-02	1.2E-01	1.4E-02	8.3E-01	5.2E-01	9.6E-02	5.9E-02	3.3E-01	3.7E-02	1.6E-02	1.6E-02	1.0E-01	1.0E-01	3.3E+00	6.1E-01	2.2E+00	4.0E-01
Sum DDT	10^{-4} Risk	mg/kg dw	3.1E+00	1.9E+00	3.8E-01	2.4E-01	1.2E+00	1.5E-01	8.3E+00	5.2E+00	9.7E-01	6.0E-01	3.3E+00	3.8E-01	1.7E-01	1.7E-01	1.0E+00	1.0E+00	3.3E+01	6.1E+00	2.2E+01	4.0E+00
Sum DDT	HQ = 1	mg/kg dw	2.3E+00	1.4E+00	2.8E-01	1.7E-01	8.9E-01	1.1E-01	1.2E+00	7.5E-01	1.4E-01	8.7E-02	4.7E-01	5.4E-02	2.9E-01	2.9E-01	1.5E-01	1.5E-01	2.4E+01	4.4E+00	1.6E+01	2.9E+00

Notes:
BSAF = biota-sediment accumulation factor
BSAR = biota-sediment accumulation regression
COC = chemical of concern
HQ = hazard quotient
PRG = preliminary remediation goal
mg/kg dw = milligrams per kilogram on a dry weight basis
mg/kg-OC = milligrams per kilogram on an organic carbon normalized basis

a For chemicals evaluated using the food web model, the water concentration input to the food web model is assumed to be equal to the background surface water concentration. OC-normalized PRGs were developed for organic COCs where BSAFs/BSARs were used i
b For multispecies diet PRGs based on BSAR/Fs (see Table 1 of Appendix A), the range of PRGs is inclusive only of those fish for which BSAR/Fs could be developed. For multispecies diet PRGs based on the FWM, a single PRG was developed through the FWM ba

c The ingestion rates used to develop PRGs for the Tribal multi-species fish consumption scenarios are based on the dietary fraction of fish that consists of resident fish species.
d Antimony and lead were identified as COCs based on detections in smallmouth bass. Because a sediment-tissue relationship could not be developed for smallmouth bass, PRGs were not calculated for other fish species.
e PRGs were not developed for PAHs in fish due to weak sediment-tissue relationships. PAHs contribute less than 1 percent of the cumulative cancer risk from fish consumption.
f PRGs were developed for individual cPAHs instead of total cPAH for shellfish consumption due to differences in bioaccumulation for individual cPAHs.
g PRGs for clam 10-4 risk for 3.3. g/day and 18 g/day ingestion rates and for crayfish 10-5 and 10-4 risk for 3.3. g/day and 18 g/day ingestion rates were extrapolated outside the range of data.
h PRGs for all risk levels and ingestion rates were extrapolated outside the range of data.
i PRG developed for PCB congener 126 as surrogate for PCB TEQ for fish and shellfish consumption.
j PRG developed for 2,3,4,7,8 PCDF as surrogate for dioxin/furan TEQ for fish and shellfish consumption.

PRG not developed because analyte is not evaluated for the cancer endpoint.
PRG not developed because analyte is not evaluated for the non-cancer endpoint.
PRG not developed because analyte is not a chemical of concern for this scenario.

NC — Analyte is a chemical of concern for this scenario, but a PRG was not calculated because a sediment-tissue relationship could not be established. See Appendix A for additional details.

Table 4. Ecological PRGs for Tissue and Dietary Dose Lines of Evidence

		Tissue Residue Assessment									Fish Dietary Assessment										Wildlife Dietary Assessment																	
																					Bird Dietary Assessment													Mammals Dietary Assessment					
		Benthic			Invertivore		Omnivore	Piscivore		Detritivore	Invertivore			Omnivore			Piscivore			Detritivore	Piscivore						Omnivore			Belted Kingfisher	Sediment probing invertivore		Aquatic-Dependent Carnivore					
Receptor →											Sculpin	Peamouth	Juvenile Chinook [a]	Largescale Sucker	Carp	White Sturgeon	Northern Pikeminnow		Smallmouth Bass	Pacific Lamprey	Osprey			Bald Eagle [b]			Hooded Merganser				Spotted Sandpiper [c]		Mink			River Otter		
Receptor Diet → (if applicable)		Clams	Crayfish	Worms	Sculpin	Peamouth	Largescale Sucker	Northern Pikeminnow	Smallmouth Bass	Pacific Lamprey	clams, sculpin, worms	clams, sculpin, worms	clams, multiplates, worms	clams, worms		clams, worms	carp, crayfish, largescale sucker, northern pikeminnow, peamouth, sculpin, worms		crayfish, sculpin, worms		brown bullhead, carp, largescale sucker, northern pikeminnow, smallmouth bass			carp, largescale sucker, northern pikeminnow, peamouth			clams, peamouth, sculpin, worms				clams	worms	crayfish, sculpin, smallmouth bass, carp			carp, crayfish, sculpin, smallmouth bass, clams		
Chemical	**Units of PRGs**																High Bioaccum	Low Bioaccum			High Bioaccum	Low Bioaccum	Refined multi sp. diet	High Bioaccum	Low Bioaccum	Refined multi sp. diet	High Bioaccum	Low Bioaccum	Refined multi sp. diet				High Bioaccum	Low Bioaccum	Refined multi sp. diet	High Bioaccum	Low Bioaccum	Refined multi sp. diet
Metals																																						
Arsenic	mg/kg dw			NC																																		
Cadmium	mg/kg dw	NC									NC		NC																									
Copper	mg/kg dw	NC	NC	NC	NC					NC	NC		NC				NC	NC													NC							
Lead	mg/kg dw					3.63E+01			NC												1.90E+03	4.31E+04											1.31E+06	1.31E+06		1.10E+04	3.04E+06	
Mercury	mg/kg dw							NC																NC	NC													
Zinc	mg/kg dw	NC		NC																																		
Butyltins																																						
Tributyltin ion	mg/kg-OC	NC		2.44E+01							3.78E+00	4.99E+00	3.49E+00	6.46E+00		8.96E+00	6.09E+00	8.92E+01	5.93E+00																		
PAHs																																						
Benzo(a)pyrene	mg/kg-OC																															4.65E+02						
Phthalates																																						
Bis(2-ethylhexyl) phthalate	mg/kg-OC	NC																																				
Dibutyl phthalate	mg/kg-OC																														NC							
PCBs																																						
PCB-77 [d]	mg/kg dw																															2.72E-03						
PCB-126 [e]	mg/kg dw																																2.44E-05	8.00E-05	4.50E-05	4.25E-05	1.36E-04	8.40E-05
Total PCBs	mg/kg dw	2.42E+00	1.37E+00	1.47E+00	2.72E-01		1.52E-01	8.55E-02	6.37E-02												1.98E-01	4.62E-01	4.23E-01	4.65E-01	1.43E+00	7.30E-01	4.62E-01	3.17E+00	6.18E-01		9.96E-01	6.06E-01	1.17E-02	6.19E-02	3.10E-02	2.28E-02	7.52E-01	6.80E-02
Dioxins/Furans																																						
2,3,4,7,8 PCDF (birds) [f]	mg/kg dw																															5.41E-05						
2,3,4,7,8 PCDF (mammals) [g]	mg/kg dw																																2.61E-05	1.71E-04	5.60E-05			
Pesticides																																						
Aldrin	mg/kg dw																															1.39E-01						
Total DDTs	mg/kg dw	2.39E+00		1.59E+00	7.62E-01																											3.18E+00						

Note:
For cases where the high and low bioaccum PRGs are the same value, only one dietary constituent could be evaluated. For metals, butyltins, PAHs, and phthalates, it may not have been possible to develop for all selected dietary constituents (see Table 8 of Appendix A).
[a] For tributyltin, the PRG based on the LOAEL value for juvenile chinook is provided (PRG based on the NOAEL is 0.662 mg/kg OC).
[b] For total PCBs, the PRG based on the LOAEL value for bald eagle is presented (PRGs based on the NOAEL value for high and low bioaccum are 2.31E+02 and 7.15E+02, respectively)
[c] PRGs are presented separately for clams and worms because the sandpiper diet was assessed separately in the BERA.
[d] PCB-77 is the surrogate for PCB TEQ - birds
[e] PCB-126 is the surrogate for PCB TEQ - mammals
[f] 2,3,4,7,8-PCDF is the surrogate for Dioxin TEQ - birds
[g] 2,3,4,7,8-PCDF is the surrogate for Dioxin TEQ - mammals

	PRG not developed because analyte is not a chemical of concern for this scenario.
NC	Analyte is a chemical of concern or on early PRG list, but a BSAR/F could not be developed. Details and rationale are provided in Appendix A.

Table 4-5. Final Sets of High and Low SQGs

Chemical		EPA 2009 SQGs	
		Low Toxicity Threshold	**High Toxicity Threshold**
Metals (mg/kg dw)		1	4
Cadmium		493	562
Copper		0	0
Mercury		0	2
Silver			
PAHs (µg/kg)			
Total benzofluoranthenes		53000	53000
Total HPAHs		22000	610000
Total LPAHs		1600	9300
SVOCs (µg/kg)			
4-methyl phenol		NA	96
Benzyl alcohol		36	36
Carbazole		1100	1100
Phthalates (µg/kg)			
Diethyl phthalate		120	NA
Phenols (µg/kg)			
Phenol		34	120
PCBs (µg/kg)			
Total PCBsa		250	500
Pesticides (µg/kg)			
delta-HCH		1.26	2.35
Dieldrin		21.5	21.5
Endrin		20.7	20.8
Endrin ketone		8.5	8.5
Total DDx		218	218
Conventionals			
Ammonia		117	171
Sulfide		38.5	38.5
Total organic carbon		13	NA

Sources: MacDonald Environmental (2002), Windward (2009), EPA (2009a, b)
a Total PCBs are based on Aroclors.
dw - dry weight
EPA - US Environmental Protection Agency
HCH - hexachlorocyclohexane
HPAH - high-molecular-weight polycyclic aromatic hydrocarbon
LPAH - low-molecular-weight polycyclic aı - not available
PAH - polycyclic aromatic hydrocarbon
PCB - polychlorinated biphenyl
SQG - sediment quality guideline
SVOC - semivolatile organic compound
Total DDx - sum of all six DDT isomers (2,4?-DDD, 4,4?-DDD, 2,4?-DDE, 4,4?-DDE, 2,4?-DDT, and 4,4?-DDT)

Table 6. Upriver Surface Sediment Central Tendency and Upper Threshold Statistics, Dry Weight Concentrations, Primary Outliers Removed.

Chemical	Units	Upper Threshold Statistic - UPL	Central Tendency Statistic - UCL
Metals			
Aluminum	mg/kg	3.38E+04	2.49E+04
Arsenic	mg/kg	3.97E+00	3.01E+00
Chromium	mg/kg	3.21E+01	2.38E+01
Copper	mg/kg	3.73E+01	2.59E+01
Mercury	mg/kg	5.32E-02	3.37E-02
Nickel	mg/kg	2.61E+01	2.14E+01
Zinc	mg/kg	1.10E+02	7.90E+01
Butyltins			
Tributyltin ion	mg/kg	NC	NC
PAHs			
Benzo(a)anthracene	mg/kg	1.57E-02	6.94E-03
Benzo(a)pyrene	mg/kg	1.53E-02	7.09E-03
Benzo(b)fluoranthene	mg/kg	2.02E-02	9.32E-03
Benzo(k)fluoranthene	mg/kg	1.05E-02	4.60E-03
Dibenzo(a,h)anthracene	mg/kg	3.20E-03	1.70E-03
Indeno(1,2,3-cd)pyrene	mg/kg	1.14E-02	5.70E-03
Naphthalene	mg/kg	6.21E-03	3.36E-03
Total cPAH	mg/kg	2.28E-02	1.10E-02
SVOCs			
Bis(2-ethylhexyl) phthalate	mg/kg	1.18E-01	6.72E-02
Hexachlorobenzene	mg/kg	2.79E-02	1.70E-02
PCBs			
PCB077	mg/kg	2.52E-05	1.08E-05
PCB126	mg/kg	3.92E-06	2.01E-06
Total PCBs[a]	mg/kg	1.70E-02	6.85E-03
PCB TEQ - Mammals 2006	mg/kg	6.06E-07	3.76E-07
Dioxins/Furans			
2,3,4,7,8-Pentachlorodibenzofuran	mg/kg	5.00E-07	1.48E-07
TCDD TEQ - Mammals 2006	mg/kg	2.16E-06	1.25E-06
Pesticides			
Aldrin	mg/kg	3.39E-04	2.67E-04
alpha-Hexachlorocyclohexane	mg/kg	NC	NC
beta-Hexachlorocyclohexane	mg/kg	1.05E-03	4.46E-04
Dieldrin	mg/kg	2.15E-04	1.37E-04
gamma-Hexachlorocyclohexane	mg/kg	NC	NC
Heptachlor	mg/kg	NC	NC
Heptachlor epoxide	mg/kg	NC	NC
Sum DDD	mg/kg	1.31E-03	6.89E-04
Sum DDE	mg/kg	1.72E-03	9.51E-04
Sum DDT	mg/kg	1.10E-03	5.44E-04
Total Chlordane	mg/kg	6.98E-04	3.80E-04
Total DDx - EPA case	mg/kg	3.03E-03	1.64E-03
Total DDx - LWG case	mg/kg	3.59E-03	1.85E-03

Notes:

[a] Total PCBs are calculated as the sum of individual congeners, where available. The sum of individual Aroclors was used for samples in which congeners were not analyzed.
cPAH - carcinogenic polycyclic aromatic hydrocarbon
NC - not calculated due to low detection frequency
PAH - polycyclic aromatic hydrocarbon
PCB - polcychlorinated biphenyl
TEQ - toxic equivalent concentration

Table 7. Upriver Surface Sediment Central Tendency and Upper Threshold Statistics, OC-Equivalent Dry Weight Concentrations, Primary Outliers Removed.

Chemical	Units	Upper Threshold Statistic - UPL	Central Tendency Statistic - UCL
Butyltins			
Tributyltin ion	mg/kg	NC	NC
PAHs			
Benzo(a)anthracene	mg/kg	2.42E-02	1.07E-02
Benzo(a)pyrene	mg/kg	2.36E-02	1.09E-02
Benzo(b)fluoranthene	mg/kg	3.10E-02	1.44E-02
Benzo(k)fluoranthene	mg/kg	1.61E-02	7.08E-03
Dibenzo(a,h)anthracene	mg/kg	4.92E-03	2.61E-03
Indeno(1,2,3-cd)pyrene	mg/kg	1.75E-02	8.77E-03
Naphthalene	mg/kg	9.57E-03	5.18E-03
Total cPAH	mg/kg	3.52E-02	1.70E-02
SVOCs			
Bis(2-ethylhexyl) phthalate	mg/kg	1.82E-01	1.03E-01
Hexachlorobenzene	mg/kg	4.30E-02	2.61E-02
PCBs			
PCB077	mg/kg	3.88E-05	1.66E-05
PCB126	mg/kg	6.04E-06	3.09E-06
Total PCBs[a]	mg/kg	2.62E-02	1.05E-02
PCB TEQ - Mammals 2006	mg/kg	9.34E-07	5.79E-07
Dioxins/Furans			
2,3,4,7,8-Pentachlorodibenzofuran	mg/kg	7.70E-07	2.28E-07
TCDD TEQ - Mammals 2006	mg/kg	3.32E-06	1.93E-06
Pesticides			
Aldrin	mg/kg	5.22E-04	4.11E-04
alpha-Hexachlorocyclohexane	mg/kg	NC	NC
beta-Hexachlorocyclohexane	mg/kg	1.62E-03	6.87E-04
Dieldrin	mg/kg	3.31E-04	2.11E-04
gamma-Hexachlorocyclohexane	mg/kg	NC	NC
Heptachlor	mg/kg	NC	NC
Heptachlor epoxide	mg/kg	NC	NC
Sum DDD	mg/kg	2.02E-03	1.06E-03
Sum DDE	mg/kg	2.65E-03	1.47E-03
Sum DDT	mg/kg	1.69E-03	8.38E-04
Total Chlordane	mg/kg	1.08E-03	5.85E-04
Total DDx - EPA case	mg/kg	4.66E-03	2.52E-03
Total DDx - LWG case	mg/kg	5.53E-03	2.85E-03

Notes:

[a] Total PCBs are calculated as the sum of individual congeners, where available. The sum of individual Aroclors was used for samples in which congeners were not analyzed.
cPAH - carcinogenic polycyclic aromatic hydrocarbon
NC - not calculated due to low detection frequency
PAH - polycyclic aromatic hydrocarbon
PCB - polcychlorinated biphenyl
TEQ - toxic equivalent concentration

Table 8. Upriver Surface Sediment Central Tendency and Upper Threshold Statistics, OC-normalized Concentrations, Primary Outliers Removed.

Chemical	Units	Upper Threshold Statistic - UPL	Central Tendency Statistic - UCL
Butyltins			
Tributyltin ion	mg/kgOC	NC	NC
PAHs			
Benzo(a)anthracene	mg/kgOC	1.99E+00	8.25E-01
Benzo(a)pyrene	mg/kgOC	1.90E+00	1.03E+00
Benzo(b)fluoranthene	mg/kgOC	2.55E+00	1.11E+00
Benzo(k)fluoranthene	mg/kgOC	1.93E+00	9.69E-01
Dibenzo(a,h)anthracene	mg/kgOC	7.95E-01	4.11E-01
Indeno(1,2,3-cd)pyrene	mg/kgOC	1.68E+00	7.10E-01
Naphthalene	mg/kgOC	8.78E-01	4.21E-01
Total cPAH	mg/kgOC	5.05E+00	2.52E+00
SVOCs			
Bis(2-ethylhexyl) phthalate	mg/kgOC	1.15E+01	6.86E+00
Hexachlorobenzene	mg/kgOC	7.92E+00	4.62E+00
PCBs			
PCB077	mg/kgOC	2.17E-03	1.01E-03
PCB126	mg/kgOC	3.63E-04	1.81E-04
Total PCBs[a]	mg/kgOC	1.58E+00	6.94E-01
PCB TEQ - Mammals 2006	mg/kgOC	5.55E-05	3.77E-05
Dioxins/Furans			
2,3,4,7,8-Pentachlorodibenzofuran	mg/kgOC	7.83E-06	3.62E-06
TCDD TEQ - Mammals 2006	mg/kgOC	5.45E-04	3.62E-04
Pesticides			
Aldrin	mg/kgOC	2.10E-02	1.59E-02
alpha-Hexachlorocyclohexane	mg/kgOC	NC	NC
beta-Hexachlorocyclohexane	mg/kgOC	1.16E-01	4.67E-02
Dieldrin	mg/kgOC	2.32E-02	1.16E-02
gamma-Hexachlorocyclohexane	mg/kgOC	NC	NC
Heptachlor	mg/kgOC	NC	NC
Heptachlor epoxide	mg/kgOC	NC	NC
Sum DDD	mg/kgOC	1.04E-01	5.98E-02
Sum DDE	mg/kgOC	1.28E-01	8.30E-02
Sum DDT	mg/kgOC	7.94E-02	3.73E-02
Total Chlordane	mg/kgOC	6.20E-02	3.34E-02
Total DDT - EPA case	mg/kgOC	2.40E-01	1.59E-01
Total DDx - LWG case	mg/kgOC	2.58E-01	1.65E-01

Notes:

[a] Total PCBs are calculated as the sum of individual congeners, where available. The sum of individual Aroclors was used for samples in which congeners were not analyzed.
cPAH - carcinogenic polycyclic aromatic hydrocarbon
NC - not calculated due to low detection frequency
PAH - polycyclic aromatic hydrocarbon
PCB - polcychlorinated biphenyl
TEQ - toxic equivalent concentration