Table ES-1
Summary of Representative Species to be Evaluated in Coeur d'Alene Basin
(Page 1 of 3)

Species		Level of Biological Organization to be Assessed				Habitat Types and CSM Units[a]					
Common Name	Scientific Name	Individual-level	Population-level	Community-level	Habitat/ Ecosystem-level	Riverine	Lacustrine	Palustrine	Riparian	Upland	Agricultural
Birds											
Great blue heron	*Ardea herodias*	X	X			3		345			
Canada goose	*Branta canadensis*	X	X			5		345			3
Tundra swan	*Cygnus columbianus*	X	X				3	34			
Wood duck	*Aix sponsa*	X	X					345			
Mallard	*Anas platyrhynchos*	X	X			5		12345			
Lesser scaup	*Aythya affinis*	X	X				345				
Common goldeneye	*Bucephala clangula*	X	X			5	345				
Common merganser	*Mergus merganser*	X	X			235	345				
Osprey	*Pandion haliaetus*	X	X			235	345				
Bald eagle (T&E)	*Haliaeetus leucocephalus*	X	X			3	345	3			
Northern harrier	*Circus cyaneus*	X	X					34	35		3
American kestrel	*Falco sparverius*	X	X						35		3
Ruffed grouse	*Bonasa umbellus*		X							12	
Wild turkey	*Meleagris gallopavo*		X						1235	12	3
Spotted sandpiper	*Actitis macularia*	X	X			1235					
Common snipe	*Gallinago gallinago*	X	X					234			3
Black tern (species of concern)	*Chlidonias niger*	X	X				34	34			
Great horned owl	*Bubo virginianus*	X	X						1235		3
Belted kingfisher	*Ceryle alcyon*	X	X			345					
Tree swallow	*Tachycineta bicolor*	X	X			1235	345				
American dipper	*Cinclus mexicanus*	X	X			12					
Swainson's thrush	*Catharus ustulatus*	X	X						12	12	
American robin	*Turdus migratorius*	X	X						1235		3
Song sparrow	*Melospiza melodia*	X	X						1235		
Mammals											
Water shrew	*Sorex palustris*		X			12					
Masked shrew	*Sorex cinereus*		X							12	
Vagrant shrew	*Sorex vagrans*		X						235		3
Long-legged myotis (species of concern)	*Myotis volans*	X	X						1235	12	
Little brown myotis	*Myotis lucifugus*		X			35	345	2345			

Table ES-1
Summary of Representative Species to be Evaluated in Coeur d'Alene Basin
(Page 2 of 3)

Species		Level of Biological Organization to be Assessed				Habitat Types and CSM Units[a]					
Common Name	Scientific Name	Individual-level	Population-level	Community-level	Habitat/ Ecosystem-level	Riverine	Lacustrine	Palustrine	Riparian	Upland	Agricultural
Raccoon	*Procyon lotor*		X			1235		12345	1235	12	3
Fisher (species of concern)	*Martes pennanti*	X	X						12	12	
Wolverine (species of concern)	*Gulo gulo luscus*	X	X						12	12	
Mink	*Mustela vison*		X			1235		12345	1235		
River otter	*Lontra canadensis*		X			35	345				
Gray wolf (T&E)	*Canis lupus*	X	X					3	123	12	3
Lynx (T&E proposed)	*Lynx canadensis*	X	X							12	
White-tailed deer	*Odocoileus virginianus*		X					4	1235		3
Mule deer	*Odocoileus hemionus*		X							12	
Beaver	*Castor canadensis*		X					12345	1235		
Muskrat	*Ondatra zibethicus*		X					12345	1235		
Deer mouse	*Peromyscus maniculatus*		X						1235	12	3
Meadow vole	*Microtus pennsylvanicus*		X						1235		3
Fish											
Bull trout (T&E)	*Salvelinus confluentus*	X				1235	345				
Westslope cutthroat trout (species of concern)	*Oncorhynchus clarki lewisi*	X				1235	345				
Chinook salmon	*Oncorhynchus tshawytscha*		X			23	4				
Rainbow trout	*Oncorhynchus mykiss*		X			235					
Mountain whitefish	*Prosopium williamsoni*		X			23					
Large-scale sucker	*Catostomus macrocheilus*		X			35					
Brown bullhead	*Ameiurus melas*		X				3				
Northern pike	*Esox lucius*		X			3	34				
Sculpins			X			12					
Smallmouth bass	*Micropterus dolomieu*		X			3					
Largemouth bass	*Micropterus salmoides*		X				3				
Yellow perch	*Perca flavescens*		X				3				
Walleye	*Stizostedion vitreum*		X				5				
Aquatic Invertebrates											
Mixed invertebrates				X		1235					
Crayfish			X					12345			
Odonates			X					12345			

Table ES-1
Summary of Representative Species to be Evaluated in Coeur d'Alene Basin
(Page 3 of 3)

Species		Level of Biological Organization to be Assessed				Habitat Types and CSM Units[a]					
Common Name	Scientific Name	Individual-level	Population-level	Community-level	Habitat/ Ecosystem-level	Riverine	Lacustrine	Palustrine	Riparian	Upland	Agricultural
Zooplankton				X			345				
Benthic invertebrates				X			345				
Aquatic Plants											
Phytoplankton				X		35	345				
Periphyton				X		125		34			
Wild rice	*Zizania aquatica*		X					34			
Water potato	*Sagittaria* spp.		X					34			
Cattail	*Typha latifolia*		X					12345			
Algae				X			34				
Submerged vegetation				X			345				
Amphibians											
Idaho (Pacific) giant salamander (species of concern)	*Dicamptodon aterrimus*	X	X			12					
Coeur d'Alene salamander (species of concern)	*Plethodon idahoensis*	X	X						12		
Spotted frog (species of concern)	*Rana pretiosa*	X	X					123	2		
Long-toed salamander	*Ambystoma macrodactylum*		X					45	35		
Terrestrial Plants											
Ute ladies'-tresses (T&E)	*Spiranthes diluvialis*		X						1235		
Cottonwood	*Populus* spp.		X					4	1235		
Willow	*Salix spp.*		X					4	1235		
Rocky Mountain maple	*Acer glabrum*		X							12	
Porcupine sedge (state sensitive species)	*Carex hystericina*		X					5	5		
Prairie cordgrass (state sensitive species)	*Spartina pectinata*		X						5		
Plant community				X					1235	12	
Terrestrial Invertebrates											
Mixed invertebrates				X					1235	12	
Soil microbial processes				X					1235	12	
Soil Processes					X				1235	12	
Landscape Characteristics					X	123			123		

[a] The number in the columns below refers to individual CSM Units (1, 2, 3, 4, or 5)

Table ES-2
Summary of Results from the Coeur d'Alene Basin Ecological Risk Assessment
(Page 1 of 2)

Receptor Type	Number of Receptors Evaluated	Lines of Evidence	Risk to Receptors	COPEC Posing Risk (COPECs = As, Cd, Cu, Pb, Hg, Zn)	Receptors with No Identified Risk	Areas with No Identified Risk
Birds	24	single-chemical external exposure, single-chemical internal exposure (blood), single-chemical internal exposure (liver or kidney), ambient toxicity tests, biological surveys	21 of 24 receptors showed risk from at least one metal, maximum LOAEL-based HQ for Pb=387 (spotted sandpiper), HQ for Zn=35 (song sparrow), HQ for Cd=6.12 (song sparrow)	Pb followed by Zn, then Cd and Cu pose greatest risks; risks from Hg are minimal; risks from As are absent; at least one COPEC in almost every CSM Unit or segment presented a risk for all but three avian species	osprey, bald eagle, northern harrier	Beaver and Prichard Creeks in CSM Unit 1
Mammals	18	single-chemical external exposure, single-chemical internal exposure (liver or kidney), ambient toxicity test	12 of 18 receptors showed risk from at least 1 metal; maximum ED_{20}-based HQ for Zn=25.5 (masked shrew), HQ for As=4.4 (muskrat), HQ for Cu=1.55 (masked shrew)	Although no one COPEC was the dominant risk driver, risks from Zn and Pb were most widely distrbuted, followed by Cd, As, Hg, and Cu	fisher, wolverine, river otter, gray wolf, lynx, beaver	Beaver and Prichard Creeks in CSM Unit 1
Fish and Other Aquatic Organisms	13+	single-chemical toxicity testing, site-specific toxicity testing, biological surveys	risks to survival, growth, and reproduction of fish and benthic invertebrates because of concentrations of metals 10 times that of acute and chronic ambient water quality criteria in more than 25 and 50 percent of samples, respectively, from some areas	Cd, Cu, Pb, and Zn pose a risk in surface water to fish and other aquatic organisms; As, Cd, Cu, Pb, and Zn in sediment pose a potential risk to fish and other aquatic organisms	none identified	no areas identified
Amphibians	4	single-chemical toxicity data, ambient media toxicity tests, biological surveys	risk posed to three of four receptors	Cd, Cu, Pb, and Zn pose risks; Cd and Pb present individual risk to three receptors in four locations; Cu presents individual-level risks at six locations; Zn presents individual-level risk at seven locations; Pb presents greatest risk in upper basin, Cd presented greatest risk in lower basin, Zn presents risks throughout	long-toed salamander	no areas identified

Table ES-2
Summary of Results from the Coeur d'Alene Basin Ecological Risk Assessment
(Page 2 of 2)

Receptor Type	Number of Receptors Evaluated	Lines of Evidence	Risk to Receptors	COPEC Posing Risk (COPECs = As, Cd, Cu, Pb, Hg, Zn)	Receptors with No Identified Risk	Areas with No Identified Risk
Terrestrial Plants	6	single-chemical toxicity data, ambient media toxicity tests, biological surveys	all six plant receptors at risk	As, Cd, Pb, Zn, and Cu pose risk to plants at community or population level; As, Cd, Pb, and Zn pose risk to Ute ladies'-tresses in CSM Units 1,2, 3 and 5	none identified	Beaver and Prichard Creeks in CSM Unit 1
Soil Invertebrates	1	single-chemical toxicity data	receptors at risk	Pb and Zn pose risk in CSM Units 1, 2, 3, and 5; Cd poses risk in Canyon Creek and Upper South Fork in CSM 1 and all segments of 2, 3, and 5; Cu poses risk in Big, Canyon, and Ninemile Creeks and the Upper South Fork in CSM Unit 1, and in all segements of Units 2 and 3; As poses risk in Pine Creek and Upper South Fork in CSM Unit 1 and in all of CSM Units 2 and 3	none identified	Beaver and Prichard Creeks in CSM Unit 1
Soil Processes	1	single-chemical toxicity data	receptors at risk	Pb and Zn pose risk in all segments of CSM Units 1, 2, and 3; Cd poses risk in five of six segments in CSM Unit 3; Cu poses risk in Canyon and Ninemile Creeks and the Upper South Fork in CSM Unit 1 and in 2 segments of CSM Unit 3; As poses risk in CSM Unit 3	none identified	Beaver and Prichard Creeks in CSM Unit 1

Notes:
NA = not applicable
No soil data were available from the Beaver or Prichard Creek watersheds.

Table ES-3
Preliminary Remedial Goals for Soil (mg/kg) for Terrestrial Biota[a]

Analytes Evaluated	Soil Biota[b]	Wildlife[b]			90th Percentile of Soil-Sediment Background		
	Population/ Community	Individual/ NOAEL-based	Population/ LOAEL-based	Population/ ED20-based	Upper Basin[b]	Lower Basin[c]	Spokane River[d]
Arsenic	16.8	14	67	40	22	12.6	9.34
Cadmium	10	9.8	105	386	2.7	0.68	0.72
Copper	100	496	751	1021	53	25	24
Lead	450	2.5	159	522	171	47	14.9
Zinc	106	27	434	261	280	97	66.4

Notes: ED_{20} = effective dose - 20 percent response
LOAEL = lowest observed adverse effect level
NOAEL = no observed adverse effect level

[a] Birds and mammals occurring in upland, agricultural, and riparian habitats; terrestrial plants and invertebrates; and soil processes.

[b] Based on various lines of evidence available for evaluation (such as comparisons to single-chemical laboratory toxicity studies; toxicity testing using soil, sediment, or water from the Coeur d'Alene Basin; and field studies in the Basin).

[c] Gott and Cathrall (1980)

[d] URSG and CH2M HILL (2000)

[e] WDOE (1994)

Table ES-4
Preliminary Remedial Goals for Sediment (mg/kg) for Aquatic Birds and Mammals[a]

Analytes Evaluated	Wildlife[b]			Site-specific Individual-level PRG for Waterfowl[b]	90th Percentile of Soil-sediment Background		
	Individual/ NOAEL-based	Population/ LOAEL-based	Population/ ED20-based		Upper Basin[c]	Lower Basin[d]	Spokane River[e]
Arsenic	54	222	138	NA	22	12.6	9.34
Cadmium	11.7	173	664	NA	2.7	0.68	0.72
Copper	1606	2157	2209	NA	53	25	24
Mercury	0.2	2.5	7	NA	0.3	-[h]	0.032
Lead	3.65[f]	249[f]	718[f]	93.3[g]	171	47	14.9
Zinc	5.3	519	390	NA	280	97	66.4

Notes: ED_{20} = effective dose - 20 percent response
LOAEL = lowest observed adverse effect level
NOAEL = no observed adverse effect level

[a] Birds and mammals occurring in palustrine, lacustrine, and riverine habitats.

[b] Based on various lines of evidence available for evaluation (such as comparisons to single-chemical laboratory toxicity studies; toxicity testing using soil, sediment, or water from the Coeur d'Alene Basin; and field studies in the Basin).

[c] Gott and Cathrall (1980)

[d] URSG and CH2M HILL (2000)

[e] WDOE (1994)

[f] For comparison, Beyer et al. (2000) derived a waterfowl no-effect concentration of 24 mg/kg and a lowest-effect concentration of 530 mg/kg and concluded that waterfowl mortality would occur if concentrations exceed 1,800 mg/kg.

[g] 10th percentile of individual-level sediment PRGs calculated for tundra swans, Canada geese, mallards, and wood ducks.

[h] Mercury was not measured in lower Basin sediment samples. Therefore, a background concentration could not be calculated.

Table ES-5
Preliminary Remedial Goals for Surface Water for Aquatic Organisms

Analytes Evaluated	Acute PRGs (µg/L)					Chronic PRGs (µg/L)					
	Hardness-adjusted Values					Hardness-adjusted Values					Aquatic Plant - Lowest Chronic Value
	10	25	30	50	100	10	25	30	50	100	
Cadmium	0.3[a]	0.9	1.2	2	4.3	0.3[a]	0.8	0.9	1.3	2.2	2
Copper	1.5[a]	3.6	4.3	7	13	1.3[a]	2.7	3.2	5	9	1
Lead	4.9	13.9	17	30	64	0.2[a]	0.4[a]	0.66[a]	1.1	2.5	500
Zinc	16.7[a]	36.2	43	65	117	16.7[a]	36.2	43	65	117	30

Note: Hardness values (10, 25, 30, 50, and 100) are as mg/L $CaCO_3$

[a] Background surface water concentrations are greater than the hardness-adjusted PRG values in certain locations and selected background statistical percentiles. See Table 2-14 for specific areas where background concentrations may exceed the PRG.

Table ES-6
Preliminary Remedial Goals for Sediment for Aquatic Organisms

Analytes Evaluated	Preliminary Remedial Goal (mg/kg dw)		
	CSM Units 1 and 2	CSM Units 3 and 4	CSM Unit 5
Arsenic	22	13	9.3
Cadmium	2.7	0.68	0.7
Copper	53	28[a]	28[a]
Lead	171	47	35[a]
Mercury	0.3	0.17[a]	0.17[a]
Silver	1.1	0.73[a]	0.73[a]
Zinc	280	98[a]	98[a]

[a] PRGs based on toxicity reference values; other PRGs default to background concentrations for those portions of the Basin.

Table ES-7
Preliminary Remediation Goals for Physical and Biological Characteristics

Physical Characteristic	CSM Unit	PRG
Riparian Habitat		
Habitat suitability index	1	Habitat suitability index for the riparian habitat that is either within the range of historical conditions prior to mining activities or within the range of conditions currently found in selected reference areas
Spatial distribution and connectivity	1	Spatial distribution and connectivity of riparian habitat that is either within the range of historical conditions prior to mining activities or within the range of conditions currently found in selected reference areas
Riverine Habitat		
Bank stability	1 and 2	Bank stability that is either within the range of historical conditions prior to mining activities or within the range of conditions currently found in selected reference areas
Substrate composition and mobility	1 and 2	Substrate composition and mobility that is either within the range of historical conditions prior to mining activities or within the range of conditions currently found in selected reference areas
Water temperature	1 and 2	Water temperature that is either within the range of historical conditions prior to mining activities or within the range of conditions currently found in selected reference areas
Spatial distribution and connectivity	1 and 2	Spatial distribution and connectivity of riverine habitat that is either within the range of historical conditions present in the basin or within the range of conditions currently found in selected reference areas
Total suspended solids	3	Total suspended solids that are either within the range of historical conditions prior to mining activities or within the range of conditions currently found in selected reference areas
Lacustrine Habitat		
Sediment deposition rate	4	Sediment deposition rate that is either within the range of historical conditions prior to mining activities or within the range of conditions currently found in selected reference areas