TABLE 1-1
List of Chemicals of Potential Concern for the Smoky Canyon Mine RI/FS

Surface Water	Sediment and Soil	Vegetation/Biota
Aluminum	Aluminum	Aluminum
Antimony	Antimony	Antimony
Arsenic	Arsenic	Arsenic
Barium	Barium	Barium
Beryllium	Beryllium	Beryllium
Boron	Boron	Boron
Cadmium	Cadmium	Cadmium
Chromium III	Chromium	Chromium
Chromium VI		
Cobalt	Cobalt	Cobalt
Copper	Copper	Copper
Iron	Iron	Iron
Lead	Lead	Lead
Manganese	Manganese	Manganese
Mercury	Mercury	Mercury
Molybdenum	Molybdenum	Molybdenum
Nickel	Nickel	Nickel
Selenium, total recoverable	Selenium	Selenium
Silver	Silver	Silver
Thallium	Thallium	Thallium
Uranium	Uranium	Uranium
Vanadium	Vanadium	Vanadium
Zinc	Zinc	Zinc

Notes:

RI/FS - Remedial Investigation/ Feasibility Study

TABLE 2-1
Vegetation Species Summary for Transect Locations, July 2010

Common Name (*Species*)	Location						
	Pole Canyon ODA	Panel A Area 1	Panel A Area 2	Panel D North	Panel D South	Panel E Area 1	Panel E Area 2
Brome (*Bromus sp.)*	√	√	√	√	√	√	√
Intermediate wheatgrass (*Agropyron intermedium)*	√	√	√	√	√	√	
Orchard grass (*Dactylis glomerata)*	√	√	√	√	√	√	√
Prickly lettuce (*Lactuca serriola)*	√	√	√		√	√	√
Silversheath knotweed (*Polygonum agryrocoleon)*		√					√
Slender wheatgrass (*Agropyron trachycaulum)*	√	√		√	√	√	√
Sterile wheat (*Sterile triticale)*		√					√
Western wheatgrass (*Pascopyron smithii)*	√	√	√	√	√	√	√
Yellow sweet clover (*Melilotus officinales)*	√	√	√	√	√		√
Bilobed speedwell (*Veronica biloba)*	√	√		√	√	√	√
Sandberg bluegrass (*Poa secunda)*		√				√	√
Silver lupine (*Lupinus argenteus*)		√	√				
Small burnet (*Sanguisorba minor)*		√		√		√	√
Thistle (*Cirsium sp.)*		√	√	√	√	√	√
Sweet clover (*Melilotus sp.)*		√					
Field pennycress (*Thlaspi arvense)*		√				√	√
Madwort (*Asperugo procumbens)*		√					
Mountain trumpet (*Collomia sp.)*	√	√		√	√	√	√
Sheep fescue (*Festuca ovina)*		√			√	√	
Willow herb (*Epilobium sp.)*	√	√	√	√	√	√	√
Blue flax (*Linum lewisii)*	√	√				√	√
Curly dock (*Rumex crispus)*		√					
Dandelion (*Taraxacum officinale)*	√	√	√		√	√	√
Great Basin wildrye (*Leymus cinereus)*		√				√	
Mountain hollyhock (*Lliamna rivularis)*		√	√				√
Western salsify (*Tragopogon dubius)*	√	√	√		√	√	
Western yarrow (*Achillea millefolium)*	√	√	√	√		√	√
Alfalfa (*Medicago sativa)*	√	√	√	√	√		
Rocky mountain penstemon (*Penstemon montanus)*		√					
Shepherd's purse (*Capsella bursa-pastoris)*		√			√	√	√
Showy goldeneye (*Heliomeris multiflora)*		√				√	√
Wheatgrass (*Agropyron sp.)*	√		√	√	√		√
Lodgepole pine (*Pinus contorta)*			√				
Sainfoin (*Onobrychis viciifolia)*	√		√	√	√		
Carex (*Carex sp.)*			√				
Kentucky/Canadian bluegrass (*Poa pratensis/Poa compressa)*			√				
Sagebrush (*Artemisia tridentata)*			√	√	√		
Timothy grass (*Phleum pratense)*	√		√	√	√	√	
White cinquefoil (*Potentilla arguta)*			√				
Fendler's Meadowrue (*Talictrum fendleri)*			√				
Sticky geranium (*Geranium viscosissimum)*			√				
Unknown forb	√		√		√	√	
Douglas fir (*Pseudotsuga menziesii)*			√	√		√	√
Orange hawkweed (*Hieracium aurantiacum)*			√				
Rosy pussytoes (*Antennaria rosea)*			√				
Snowberry (*Symphoricarpos occidentalis)*			√				
Rose (*Rosa sp.)*	√		√		√		
Penstemon (*Penstemon sp.)*	√			√	√	√	√

TABLE 2-1
Vegetation Species Summary for Transect Locations, July 2010

Common Name (*Species*)	Location						
	Pole Canyon ODA	Panel A Area 1	Panel A Area 2	Panel D North	Panel D South	Panel E Area 1	Panel E Area 2
Festuca sp				√	√		
Red clover (*Trifolium pratense)*				√	√		
White clover (*Trifolium repens)*				√			√
Moss				√	√		
Yampeh (*Perideridia gairdneri)*	√			√	√		
Field mustard (*Brassica rapa)*					√		√
Cinquefoil (*Potentilla sp.)*	√					√	
Waterleaf (*Phacelia sp.)*						√	√
Buckbrush (*Ceanothus velutinus)*						√	
Cheat (*Bromus tectorum)*						√	√
Western sticktight (*Lappula occidentalis)*						√	√
Green needlegrass (*Nassella viridula)*							√
Tansymustard (*Descurainia sp.)*							√
Blue wildrye (*Elymus glaucus)*							√
Bluegrass (*Poa sp.)*	√						√
Idaho fescue (*Festuca idahoensis)*	√						√
Lupine (*Lupinus sp.)*	√						
White knapweed (*Centaurea diffusa)*	√						
Crested wheatgrass (*Agropyron cristatum)*	√						
Standing Dead	√	√	√	√	√	√	√
Bare Ground/Rock	√	√	√	√	√	√	√

Notes:

ODA - Overburden Disposal Area

TABLE 2-2
Summary of General Composite Vegetation Sample Composition for Mine Panel Locations - Dominant Species Information, June 2010

Common Name (*Species*)	Location						
	Pole Canyon ODA	Panel A Area 1	Panel A Area 2	Panel D North	Panel D South	Panel E Area 1	Panel E Area 2
Orchard Grass (*Dactylis glomerata)*	√	√	√	√	√	√	√
Slender wheatgrass (*Agropyron trachycaulum)*	√	√	√	√	√	√	√
Fescue (*Festuca ovina)*	√				√	√	
Brome (*Bromus sp.)*	√		√	√	√	√	√
Sainfoin (*Onobrychis viciifolia)*	√			√			
Sagebrush (*Artemisia tridentata)*	√						
Timothy grass (*Phleum pratense)*	√			√	√	√	
Alfalfa (*Medicago sativa)*	√		√	√	√		√
Wheatgrass (*Agropyron sp.)*	√				√	√	√
Clover (*Trifolium sp.)*	√			√	√		√
Intermediate wheatgrass (*Agropyron intermedium)*	√						
Dandelion (*Taraxacum officinale)*			√			√	
Sedge (*Carex sp.)*			√				
Waterleaf (*Phacelia sp.)*			√				
Common Yarrow (*Achillea millefolium)*				√		√	
Burnet (*Sanguisorba sp.)*				√			√
Penstemon (*Penstemon sp.)*					√		√
Alsike clover (*Trifolium hybridum)*					√		
Great Basin Wildrye (*Leymus cinereus)*						√	
Snowbrush ceanothus (*Ceanothus velutinus)*						√	
Rocky Mountain penstemon (*Penstemon montanus)*						√	
Ballhead waterleaf (*Hydrophyllum capitatum)*						√	
Lodgepole pine (*Pinus contorta)*						√	
Bluegrass (*Poa sp.)*						√	
Alyssum (*Alyssum sp.)*						√	
Shepard's purse (*Capsella bursa-pastoris)*						√	
Whitetop (*Cardaria draba)*							√
Oniongrass (*Melica bulbosa)*							√
Tansymustard (*Descurainia sp.)*							√
Western wheatgrass (*Pascopyron smithii)*						√	√
Prickly lettuce (*Lactuca serriola)*							√
Mustard (*Brassica sp.)*							√
Phacelia (*Phacelia hastata)*							√
Willow herb (*Epilobium sp.)*							√

Notes:

ODA - Overburden Disposal Area

TABLE 2-3
Summary of General Composite Vegetation Sample Composition for Northern Sage Valley, Seeps, and Riparian Locations - Dominant Species Information, June 2010

Common Name (*Species*)	Sampling Area								
	Northern Sage Valley - Irrigated Area	Panel D - Seep	Panel E - Seeps	Hoopes Springs Complex Area	Smoky Creek - Riparian	Pole Canyon Creek - Riparian	Sage Creek - Riparian	Hoopes Spring (HS-3) - Riparian	South Fork Sage Creek - Riparian
Orchard Grass (*Dactylis glomerata)*		√	√			√			
Slender wheatgrass (*Agropyron trachycaulum)*									
Fescue (*Festuca ovina)*	√	√							
Brome (*Bromus sp.)*			√						
Sainfoin (*Onobrychis viciifolia)*									
Sagebrush (*Artemisia tridentata)*	√		√	√	√	√	√		√
Timothy grass (*Phleum pratense)*	√	√	√	√		√			
Alfalfa (*Medicago sativa)*		√							
Wheatgrass (*Agropyron sp.)*									
Clover (*Trifolium sp.)*	√	√				√			
Intermediate wheatgrass (*Agropyron intermedium)*									
Dandelion (*Taraxacum officinale)*	√		√	√		√	√	√	
Sedge (*Carex sp.)*	√	√	√	√	√	√	√	√	√
Waterleaf (*Phacelia sp.)*									
Common Yarrow (*Achillea millefolium)*	√								
Burnet (*Sanguisorba sp.)*									
Penstemon (*Penstemon sp.)*									
Alsike clover (*Trifolium hybridum)*									
Great Basin Wildrye (*Leymus cinereus)*									
Snowbrush ceanothus (*Ceanothus velutinus)*									
Rocky Mountain penstemon (*Penstemon montanus)*									
Ballhead waterleaf (*Hydrophyllum capitatum)*						√			
Lodgepole pine (*Pinus contorta)*									
Bluegrass (*Poa sp.)*		√	√	√			√		
Alyssum (*Alyssum sp.)*									
Shepard's purse (*Capsella bursa-pastoris)*									
Whitetop (*Cardaria draba)*									
Oniongrass (*Melica bulbosa)*									
Tansymustard (*Descurainia sp.)*									
Western wheatgrass (*Pascopyron smithii)*									
Prickly lettuce (*Lactuca serriola)*									
Mustard (*Brassica sp.)*									

TABLE 2-3
Summary of General Composite Vegetation Sample Composition for Northern Sage Valley, Seeps, and Riparian Locations - Dominant Species Information, June 2010

Common Name (*Species*)	Sampling Area								
	Northern Sage Valley - Irrigated Area	Panel D - Seep	Panel E - Seeps	Hoopes Springs Complex Area	Smoky Creek - Riparian	Pole Canyon Creek - Riparian	Sage Creek - Riparian	Hoopes Spring (HS-3) - Riparian	South Fork Sage Creek - Riparian
Phacelia (*Phacelia hastata)*									
Willow herb (*Epilobium sp.)*									√
Rush (*Juncus sp.)*	√			√	√			√	√
Buttercup (*Ranunculus sp.)*	√								√
Kentucky blugrass (*Poa pratensis)*	√					√			
Unknown forb	√								
Willow (*Salix sp.)*	√			√	√		√		√
Shrubby cinquefoil (*Dasiphora fruticosa)*	√			√	√				
Lupine (*Lupinus sp.)*	√								
Dock (*Rumex sp.)*	√								
Broom snakeweed (*Gutierrezia sarothrae)*	√								
Groundsel (*Senecio sp.)*	√								
White clover (*Trifolium repens)*	√								
Broadleaf cattail (*Typha latifolia)*		√							
Knotweed (*Polygonum sp.)*		√							
American speedwell (*Veronica americana)*			√						
Snowberry (*Symphoricarpos occidentalis)*			√			√			
Nettle (*Urtica sp.)*			√						
Silver sagebrush (*Artemisia cana)*									
Watercress (*Nasturtium officinale)*				√					√
Currant (*Ribes sp.)*				√					
American bistort (*Polygonum bistortoides)*				√			√		
Starry false lily of the valley (*Maianthemum stellatum)*					√		√		
Virginia strawberry (*Fragaria virginiana)*					√				
Twinberry honeysuckle (*Lonicera involucrata)*							√		
Slender cinquefoil (*Potentilla gracilis)*					√				

Note:
The species identified in this table were representative of the dominant species found in the plot at the time of sampling in 2010.

TABLE 2-4
Potential Terrestrial and Riparian/Aquatic Species Present at Smoky Canyon Mine Site

Mammals	
Common Name	***Scientific Name***
Grazers	
Elk	***Cervus elaphus***
Browsers	
Moose	***Alces alces***
Mule deer	***Odocoileus hemionus***
Omnivores	
Raccoon	*Procyon lotor*
Red fox	***Vulpes vulpes***
Striped skunk	*Mephitis mephitis*
Black bear	***Ursus americanus***
Carnivores	
Mink	*Mustela vison*
Coyote	***Canis latrans***
Grey Wolf	***Canis lupus***
North American Wolverine	*Gulo gulo*
Bobcat	***Lynx rufus***
Badger	***Taxidea taxus***
Mountain lion	***Felis concolor***
American marten	*Martes americana*
Long-tailed weasel	***Mustela frenata***
Ermine	***Mustela erminea***
Small Herbivores & Rodents	
Deer mouse	***Peromyscus maniculatus***
Western harvest mouse	*Reithrodontomys megaloti*
Bushy-tailed woodrat	*Neotoma cinerea*
Long-tailed vole	***Microtus longicaudus***
Meadow vole	***Microtus pennsylvanicus***
Montane vole	***Microtus montanus***
Southern red-backed vole	*Clethrionomys gapperi*
Sagebrush vole	*Lemmiscus curtatus*
Shrew	***Sorex* spp.**
American beaver	***Castor canadensis***
Muskrat	*Ondatra zibethicus*
Porcupine	*Erithizon dorsatum*
Least chipmunk	***Tamias minimus***
Yellow pine chipmunk	*Tamias amoenus*
Yellow-bellied marmot	***Marmota flaviventris***
Pine squirrel	*Tamiasciurus hudsonicus*
Northern flying squirrel	*Glaucomys abrinus*
Uinta ground squirrel	*Spermophilus armatus*
Nuttall's cottontail	*Sylvilagus nuttalli*
Black-tailed jackrabbit	*Lepus californicus*
Snowshoe hare	*Lepus americanus*
Bats	
Big brown bat	***Eptesicus fuscus***
Little brown bat	***Myotis lucifugus***
Long-legged myotis	***Myotis volans***
Silver-haired bat	***Lasionycteris noctivagans***
Western long-eared myotis	***Myotis evotis***
Reptiles	
Common Name	***Scientific Name***
Rubber boa	*Charina bottae*
Western terrestrial garter snake	***Thamnophis elegans***

Birds	
Common Name	***Scientific Name***
Herbivores	
Chipping sparrow*	*Spizella passerina**
Song sparrow*	*Melospiza melodia**
Cassin's finch*	*Carpodacus cassinii**
Dark-eyed junco*	*Junco hyemalis**
Vesper sparrow*	*Pooecetes gramineus**
Pine siskin*	*Carduelis pinus**
Red crossbill*	*Loxia curvirostra**
White-crowned sparrow*	*Zonotrichia leucophrys**
Omnivores	
American robin*	*Turdus migratorius**
Yellow-headed blackbird*	*Xanthocephalus xanthocephalus**
Red-winged blackbird*	*Agelaius phoeniceus**
Brewer's blackbird*	*Euphagus cyanocephalus**
Brown-headed cowbird*	*Molothrus ater**
Black-billed magpie*	*Pica hudsonia**
Three-toed woodpecker	***Picoides tridactylus***
Common raven*	*Corvus corax**
Gray jay*	*Perisoreus canadensis**
Green-tailed towhee*	*Pipilo chlorurus**
Hairy woodpecker*	***Picoides villosus****
Red-naped sapsucker*	***Sphyrapicus nuchalis****
Williamson's sapsucker*	***Sphyrapicus thyroideus****
Sandhill crane*	***Grus canadensis****
Swainson's thrush*	*Catharus ustulatus**
Townsend's solitaire*	*Myadestes townsendi**
Western meadowlark*	*Sturnella neglecta**
Western tanager*	*Piranga ludoviciana**
Western wood-pewee*	*Contopus sordidulus**
Belted kingfisher*	***Megaceryle alcyon****
Insectivores	
Bank swallow*	*Riparia riparia**
Tree swallow*	*Tachycineta bicolor**
Black-capped chickadee*	*Poecile atricapillus**
Mountain chickadee*	*Poecile gambeli**
Common nighthawk*	*Chordeiles minor**
MacGillivray's warbler*	*Oporornis tolmiei**
Mountain bluebird*	*Sialia currucoides**
Northern flicker*	*Colaptes auratus**
Red-breasted nuthatch*	*Sitta carolinensis**
White-breasted nuthatch*	*Sitta carolinensis**
Yellow warbler*	*Dendroica petechia**
Yellow-rumped warbler*	*Dendroica coronata**
House wren*	*Troglodytes aedon**
Raptors	
Northern harrier*	***Circus cyaneus****
Bald eagle*	***Haliaeetus leucocephalus****
Northern goshawk*	***Accipiter gentilis****
Golden eagle*	***Aquila chrysaetos****
Red-tailed hawk*	***Buteo jamaicensis****
Swainson's hawk *	***Buteo swainsoni****
Cooper's hawk*	*Accipiter cooperii**
American kestrel*	***Falco sparverius****

TABLE 2-4
Potential Terrestrial and Riparian/Aquatic Species Present at Smoky Canyon Mine Site

Amphibians	
Common Name	***Scientific Name***
Tiger salamander	***Ambystoma tigrinum***
Boreal chorus frog	***Pseudacris maculata***
Northern leopard frog	*Rana pipiens*
Fish	
Common Name	***Scientific Name***
Yellowstone cutthroat trout	***Oncorhynchus clarki bouvieri***
Rainbow trout	***Oncorhynchus mykiss***
Brown trout	***Salmo trutta***
Brook trout	***Salvelinus fontinalis***
Mountain whitefish	***Prosopium williamsoni***
Utah chub	*Gila atraria*
Longnose dace	***Rhinichthys cataractae***
Speckled dace	***Rhinichthys osculus***
Redside shiner	***Richardsonius balteatus***
Utah sucker	***Catostomus ardens***
Mountain sucker	*Catostomus platyrhynchus*
Bluehead sucker	*Catostomus discobolus*
Mottled sculpin	***Cottus bairdi***
Fish	
Common Name	***Scientific Name***
Paiute sculpin	***Cottus beldingi***
Black bullhead	*Ictalurus melas*
Fathead minnow	*Pimephales promelas*
Carp	*Cyprinus carpio*
Northern leatherside chub	*Lepidomeda copei*

Game Birds	
Ruffed grouse	***Bonasa umbellus***
Blue grouse	***Dendragapus obscurus***
Mourning dove*	*Zenaida macroura**
Hungarian partridge	*Perdix perdix*
Chukar partridge	*Alectoris chukar*
Greater sage grouse	***Centrocercus urophasianus***
Sharp-tailed grouse	*Tympanuchus phasianellus*
Aquatic	
Great blue heron*	***Ardea heroidas****
Mallard*	***Anas platyrhynchos****
American widgeon*	***Anas americana****
Canada goose*	***Branta canadensis****
American coot*	***Fulica americana****
Franklin's gull*	***Larus pipixcan****
Gadwall*	***Anas strepera****
Lesser scaup*	***Aythya affinis****
Birds	
Common Name	***Scientific Name***
Eared grebe*	***Podiceps nigricolli****
Western grebe*	***Aechmophorus occidentalis****
Pied-billed grebe*	***Podilymbus podiceps****
Redhead*	***Aythya americana****
Green-winged teal*	***Anas crecca****
Cinnamon teal*	***Anas cyanoptera****
Common goldeneye*	***Bucephala clangula****
American white pelican*	***Pelecanus erythrorhynchos****
Owls	
Boreal owl*	*Aegolius funereus**
Flammulated owl*	***Otus flammeolus****
Great gray owl*	***Strix nebulosa****
Great-horned owl*	***Bubo virginianus****
Shore Birds	
Common snipe*	*Gallinago gallinago**
American avocet*	***Recurvirostra americana****
Long-billed curlew*	***Numenius americanus****
Spotted sandpiper*	***Actitis macularius****
Killdeer*	***Charadrius vociferus****
Scavengers	
Turkey vulture*	***Cathartes aura****

Notes:
This list includes species known, suspected, or possible to occur in the region (e.g., Blackfoot River subbasin) including the project area, based on regional documents. These species, or their habitats, may not definitively occur at Smoky, nor is this list all inclusive.

Species or evidence of species (e.g., scat, tracks, recent beaver dams) definitively seen during sampling activities at Smoky are noted in boldface.

(*) Indicates species protected by the Migratory Bird Treaty Act (MBTA) (USFWS 2012).

U.S. Fish and Wildlife Service (USFWS). 2012. Birds Protected by the Migratory Bird Treaty Act: List of Migratory Birds. U.S Fish and Wildlife Service, Migratory Bird Program. Available at http://www.fws.gov/migratorybirds/RegulationsPolicies/mbta/mbtandx.html. Accessed April 2012.

List of reviewed documents:
- Smoky Canyon Mine, Panels F & G Final Environmental Impact Statement. October 2007.
- Smoky Canyon Mine Draft Area B (Tailings Ponds Area) Baseline Ecological Risk Assessment Report. July 2003.
- Smoky Canyon Mine Remedial Investigation/Feasibility Study 2010 Data Summary Report. October 2011.
- Smoky Canyon Mine Remedial Investigation/Feasibility Study (RI/FS) Final Remedial Investigation Report. September 2014.

TABLE 2-5
Summary of Tygee Creek and Sage Creek Basin Characteristics

Location	Headwater Elavation (feet)	Mouth Elevation (feet)	Creek Distance (mile)	Weighted Average Gradient Based on Stream Length (feet/foot)	Basin Area (mile)
Tygee Creek Basin					
Smoky Creek	8,294	6,339	7.11	0.052	6.3
Roberts Creek	7,530	6,391	3.06	0.07	1
East Tygee Creek	7,083	6,506	1.86	0.059	1.2
Tygee Creek[1]	6,896	6,309	6.12	0.018	9.3
Tygee Creek Basin[2]	8,294	6,309	-	0.044	17.8
Sage Creek Basin					
Pole Canyon Creek	8,091	6,660	4.33	0.063	2.7
North Fork Sage Creek	7,254	6,594	4.42	0.028	3.6
Sage Creek[3]	8,458	6,391	10.25	0.038	11.2
South Fork Sage Creek	7,972	6,496	4.79	0.058	6.1
Sage Creek Basin[2]	8,458	6,391	-	0.045	23.6

Notes:

[1]Tygee Creek to confluence with Draney Creek not including Roberts Creek, East Tygee Creek, or Smoky Creek.

[2]Tygee Creek basin and Sage Creek basin values represent the entire basin.

[3]Sage Creek to confluence with Crow Creek; this does not include Pole Canyon Creek, North Fork Sage Creek, or South Fork Sage Creek.

TABLE 2-6
Presence/Absence of Fish Species by Location, Fall 2006 - Fall 2012

Family/Common Name (*Species*)	Upstream Crow Creek			Deer Creek						Hoopes Spring		Sage Creek			South Fork Sage Creek		Downstream Crow Creek	
	CC-75	CC-150	CC-350	DC-100	DC-200	DC-600	NFDC-200AQ	NFDC-700	SFDC-900	HS	HS-3	LS	LSV-2C	LSV-4	LSS-US	LSS	CC-1A	CC-3A
Salmonidae																		
Brook Trout *(Salvelinus fontinalis)*																	√	√
Cuttbow: Rainbow Trout (*Oncorhynchus mykiss*)/ Cutthroat Trout (*Oncorhynchus clarki bouvieri*)																	√	
Rainbow Trout *(Oncorhynchus mykiss)*																		
Brown Trout *(Salmo trutta)*	√	√	√							√	√	√	√	√		√	√	√
Cutthroat Trout (*Oncorhynchus clarki bouvieri*)	√	√	√	√	√	√		√			√	√	√	√		√	√	√
Mountain Whitefish *(Prosopium williamsoni)*		√	√											√			√	√
Cottidae																		
Paiute Sculpin *(Cottus beldingi)*	√	√	√			√				√	√		√	√		√	√	√
Mottled Sculpin *(Cottus bairdi)*	√	√															√	√
Cyprinidae																		
Leatherside Chub *(Snyderichtys copei)*			√															
Longnose Dace *(Rhinichthys cataractae)*		√	√														√	√
Speckled Dace (*Rhinichthys osculus*)		√	√														√	√
Chub Species		√															√	√
Cyprinid species		√																√
Redside Shiner *(Richardsonius balteatus)*		√	√														√	√
Catostomidae																		
Utah Sucker *(Catostomus ardens)*		√	√														√	√
Mountain Sucker *(Catostomus platyrhynchus)*			√															

TABLE 2-7
Special Status Species Potentially Present in the Vicinity of the Site

Common Name[1]	Scientific Name[1]	USFWS (Caribou County) January 2013[2]	IDAPA 2012[3] (Idaho)	IDFG-IFWIS 2012[4] (Site vicinity)	USFS (Caribou NF) July 2011[5]
Birds					
American White Pelican	*Pelecanus erythrorhynchos*				
Bald Eagle	*Haliaeetus leucocephalus*		Protected Non Game	G4; S3B,S4N	Sensitive
Boreal Owl	*Aegolius funereus*			G5; S2	Sensitive
Black Tern	*Chlidonias niger*				
Brewer's Sparrow	*Spizella breweri*				
Calliope Hummingbird	*Stellula calliope*				
Columbian Sharp-Tailed Grouse	*Tympanuchus phasianellus columbianus*			G4; S1	Sensitive
Flammulated Owl	*Otus flammeolus*				Sensitive
Ferruginous Hawk	*Buteo regalis*				
Greater Sage-Grouse	*Centrocercus urophasianus*	Candidate		G3G4; S2	Sensitive
Great Gray Owl	*Strix nebulosa*				Sensitive
Hammond's Flycatcher	*Empidonax hammondii*				
Harlequin Duck	*Histrionicus histrionicus*				Sensitive
Lewis' Woodpecker	*Melanerpes lewis*				
Loggerhead Shrike	*Lanius ludovicianus*				
Northern Goshawk	*Accipiter gentilis*				Sensitive
Olive-sided Flycatcher	*Contopus borealis*				
Peregrine Falcon	*Falco peregrinus anatum*		Protected Non Game		Sensitive
Prairie Falcon	*F. mexicanus*				
Sage Sparrow	*Amphispiza belli*				
Three-Toed Woodpecker	*Picoides tridactylus*				Sensitive
Trumpeter Swan	*Cygnus buccinator*			G4; S1B, S2N	Sensitive
White-faced Ibis	*Plegadis chihi*				
Williamson's Sapsucker	*Sphyrapicus throideus*				
Willow Flycatcher	*Empidonax traillii*				
Yellow-Billed Cuckoo	*Coccyzus americanus*				
Long-Billed Curlew	*Numenius americanus*			G5; S2B	
Virginia's Warbler	*Vermivora virginae*				
Merlin	*Falco columbarius*			G5; S2B, S2N	
Mammals					
Gray Wolf (Rocky Mountain DPS)	*Canis lupus*				Sensitive
Rock Squirrel	*Spermophilus variegatus*		Protected Non Game		
North American Wolverine	*Gulo gulo luscus*		Protected Non Game		Sensitive
Pygmy Rabbit	*Brachylagus idahoensis*				Sensitive
Woodland Caribou (Selkirk Mountain Caribou)	*Rangifer tarandus caribou*		Endangered		
Canada Lynx	*Lynx canadensis*	Threatened (no designated Critical Habitat in Caribou County)	Threatened	G5; S1 (no critical habitat in Site vicinity)	Threatened
Grizzly Bear	*Ursus arctos horribilis*				Threatened
Northern Idaho Ground Squirrel	*Spermophilus brunneus brunneus*		Threatened		
American Pika	*Ochotona princeps*		Protected Non Game		
Bats	all species		Protected Non Game		Sensitive[a]
Chipmunks	*Neotamias* spp.		Protected Non Game		
Columbia Plateau (Merriam's) Ground Squirrel	*Spermophilus canus vigilis*		Protected Non Game		
Golden-Mantled Ground Squirrel	*Spermophilus lateralis*		Protected Non Game		
Great Basin (piute) Ground Squirrel	*Spermophilus canus vigilis*		Protected Non Game		

TABLE 2-7
Special Status Species Potentially Present in the Vicinity of the Site

Common Name[1]	Scientific Name[1]	USFWS (Caribou County) January 2013[2]	IDAPA 2012[3] (Idaho)	IDFG-IFWIS 2012[4] (Site vicinity)	USFS (Caribou NF) July 2011[5]
Kit Fox	*Vulpes macrotis*		Protected Non Game		
Northern Flying Squirrel	*Glaucomys sabrinus*		Protected Non Game		
Red Squirrel	*Tamiasciurus hudsonicus.*		Protected Non Game		
Southern Idaho Ground Squirrel	*Spermophilus brunneus endemicus*		Protected Non Game		
Wyoming Ground Squirrel	*Spermophilus elegans nevadensis*		Protected Non Game		
Fish					
Bear Lake Cutthroat Trout	*Oncorhynchus clarki pop 3*				
Bear Lake Sculpin	*Cottus extensus*		Protected Non Game		
Bear Lake Whitefish	*Prosopium abyssicola*				
Bluehead Sucker	*Catostomus discobolus*		Protected Non Game		
Bonneville Cisco	*Prosopium gemmifer*				
Bonneville Whitefish	*Prosopium spilonotus*				
Bonneville Cutthroat Trout	*Oncorhynchus clarki utah*				
Burbot, Ling	*Lota lota.*		Endangered		
Bull Trout	*Salvelinus confluentus*		Threatened		
Chinook Salmon (spring, summer, and fall)	*Oncorhynchus tshawytscha*		Threatened		
Leatherside Chub	*Gila copei*				
Northern Leatherside Chub	*Lepidomeda copei*		Protected Non Game		Sensitive
Pacific Lamprey	*Lampetra tridentata*		Endangered		
Sand Roller	*Percopsis transmontana*		Protected Non Game		
Shoshone Sculpin	*Cottus greenei*		Protected Non Game		
Sockeye Salmon	*Oncorhynchus nerka*		Endangered		
Yellowstone Cutthroat Trout	*Oncorhynchus clarki bouvieri*				Sensitive [b]
Steelhead Trout (Snake River summer)	*Oncorhynchus mykiss gairdneri*		Threatened		
White Sturgeon (Kootenai River population)	*Acipenser transmontanus*		Endangered		
Wood River Sculpin	*Cottus leiopomus*		Protected Non Game		
Amphibians/Reptiles					
Boreal Toad	*Bufo boreas boreas*				Sensitive
Columbia Spotted Frog (Great Basin population)	*Rana luteiventris*				Sensitive
Common Garter Snake	*Thamnophis sirtalis*			G5; S3	
Western Toad	*Bufo boreas*				
Northern Leopard Frog	*Rana pipiens*			G5; S2	
Invertebrates					
Utah Valvata Snail	*Valvata utahensis*				
Bliss Rapids Snail	*Taylorconcha serpenticola*				
Bear Lake Springsnail	*Pyrgulopsis pilsbryana*			G2; S2	
Western Pearlshell	*Margaritifera falcata*			G4; S3	
Columbia Pebblesnail	*Fluminicola fuscus*			G4; SNR	
Plants					
Whitebark Pine	*Pinus albicaulis*	Candidate			
Alderleaf Mountain Mahogany	*Cercocarpus montanus*				

TABLE 2-7
Special Status Species Potentially Present in the Vicinity of the Site

Common Name[1]	Scientific Name[1]	USFWS (Caribou County) January 2013[2]	IDAPA 2012[3] (Idaho)	IDFG-IFWIS 2012[4] (Site vicinity)	USFS (Caribou NF) July 2011[5]
Cooper's Hymenoxys	*Hymenoxys cooperi* var.*canescens*				
Iodinebush	*Alenrolfea occidentalis*				
Red Glasswort	*Salicornia rubra*				
Silky Cryptantha	*Cryptantha sericea*				
Idaho Sedge	*Carex idahoa*				
Ute Ladies' Tresses Orchid	*Spiranthes diluvialis*				Threatened - ? (suspected/ potential habitat)
Meadow Milkvetch	*Astragalus diversifolius A. Gray*				
Starveling Milkvetch	*Astragalus jejunus* var. *jejunus*				Sensitive
Payson Bladderpod	*Lesquerella paysonii*				Sensitive
Cache Beardtongue	*Penstemon compactus*				Sensitive
Hoary Willow	*Salix candida*			G5; S2	

Notes:

[1] These species are identfied for the region; not all species in the table definitely occur at the Site.

U.S. Fish and Wildlife Service (USFWS)

[2] U.S. Fish and Wildlife Service (USFWS). 2013. U.S Fish and Wildlife Service – Idaho Fish and Wildlife Office, Endangered, Threatened, Proposed, and Candidate Species (With Associated Proposed and Critical Habitats), updated 11/28/2012 and dated 1/4/2013. USFWS, Idaho Fish and Wildlife Office, Boise, ID. Includes species identified for Caribou County only.

Idaho Administrative Procedures Act (IDAPA)

[3] Idaho Administrative Procedures Act (IDAPA). 2012. 13.01.06 – Rules Governing Classification and Protection of Wildlife. Idaho Department of Fish and Game. Available at http://adminrules.idaho.gov/rules/2012/13/0106.pdf

Definitions from IDAPA (2013) for Threatened/Endangered species:
Endangered: Any native species in danger of extinction throughout all or a significant portion of its Idaho range.
Threatened Species: Any native species likely to be classified as Endangered within the foreseeable future throughout all or a significant portion of its Idaho range.

Idaho Department of Fish and Game (IDFG)-Idaho Fish and Wildlife Information System (IFWIS)
Table lists only the species in Site vicinity from IDFG (2012), as presented on Figure 5.9-1.

[4] Idaho Department of Fish and Game (IDFG). 2012. Location information for Idaho at-risk species designated by the Comprehensive Wildlife Conservation Strategy (CWCS). Data are part of the Idaho Fish and Wildlife Information System (IFWIS) managed by the Idaho Department of Fish and Game (IDFG). Data for Caribou County, ID received October 30, 2012. Refer to Figure 5.9-1 for more information.

Definitions from IDFG & IFWIS (Nature Serve Explorer 2010)
G2: Nature Serve Global Conservation Status Rank, Imperiled
G3: Nature Serve Global Conservation Status Rank,Vulnerable
G4: Nature Serve Global Conservation Status Rank, Apparently Secure
G5: Nature Serve Global Conservation Status Rank, Secure
S1: Nature Serve Subnational Conservation Status Rank, Critically Imperiled
S2: Nature Serve Subnational Conservation Status Rank, Imperiled
S3: Nature Serve Subnational Conservation Status Rank, Vulnerable
S4: Nature Serve Subnational Conservation Status Rank, Apparently Secure
B: Breeding- Conservation status refers to the breeding population of the species in
SNR: not ranked
N: Nonbreeding- Conservation status refers to the non-breeding population of the species in the nation or state/province

U.S. Forest Service (USFS)

[5] U.S. Forest Service (USFS). 2011. Intermountain Region (R4) Threatened, Endangered, Proposed, and Sensitive Species, July 27, 2011 update, Known/Suspected Distribution by Forest. Table presents information for Caribou National Forest (NF) only. Available at http://www.fs.fed.us/r4/resources/tes/r4_tes_lst.pdf. July 27, 2011.

a - Species listed in USFS (2011) include: Spotted bat (*Euderma maculatum*), Townsend's Western Big-Eared Bat (*Corynorhinus townsendii townsendii*)

b - Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*) and Bonneville cutthroat trout (*Oncorhynchus clarki utah*) are lumped together.

Caribou NF Fish Biologist Jim Capurso (USFS 2010) indicated that Snake River fine-spotted and Bonneville cutthroat trout can be lumped and referred to as Yellowstone cutthroat trout. He also verified that the northern leatherside chub is a sensitive species.

U.S. Forest Service (USFS). 2010. Telephone communication from James Capurso (USFS fisheries biologist) to Formation Environmental; regarding species of concern listed on USFS's 10/30/2009 list from A. Keysor. May 5, 2010.

TABLE 2-8
Screening-Level Sediment Benchmarks

ECOPC			SQAGS[1a,b]		NOAA SQUIRTS[2]				Literature Derived Benchmarks			Benchmark	
CASNo	Analyte	Units	TEC	PEC	LELs	SELs	UETs	ARCS	Value	Type	Source	TRV_{low}	TRV_{high}
7429-90-5	Aluminum	mg/kg	---	---	---	---	---	25,500	---	---		25,500	
7440-36-0	Antimony	mg/kg	---	---	---	---	3	---	---	---			3
7440-38-2	Arsenic	mg/kg	9.8	33	6	33	17	---	---	---		9.8	33
7440-39-3	Barium	mg/kg	20	---	---	---	---	---	---	---		20	
7440-41-7	Beryllium	mg/kg	---	---	---	---	---	---	---	---		---	---
7440-42-8	Boron	mg/kg	---	---	---	---	---	---	235.5 - 310.6	IC_{25}	3	235.5	310.6
7440-43-9	Cadmium	mg/kg	1	4.98	0.6	10	3	---	---	---		1	4.98
7440-47-3	Chromium	mg/kg	43	111	26	110	95	---	---	---		43	111
7440-48-4	Cobalt	mg/kg	50	---	---	---	---	---	80	PRG	4	50	80
7440-50-8	Copper	mg/kg	32	149	16	110	86	---	---	---		32	149
7439-89-6	Iron	mg/kg	---	---	20,000	40,000	40,000	---	---	---		20,000	40,000
7439-92-1	Lead	mg/kg	36	128	31	250	127	---	---	---		36	128
7439-96-5	Manganese	mg/kg	---	---	460	1,100	1,100	---	1800	AET	5	460	1100
7439-97-6	Mercury	mg/kg	0.18	1.06	0.2	2	0.56	---	---	---		0.18	1.06
7439-98-7	Molybdenum	mg/kg	---	---	---	---	---	---	3742	NOEC	6	3742	
7440-02-0	Nickel	mg/kg	23	48.6	16	75	43	---	---	---		23	48.6
7782-49-2	Selenium	mg/kg	---	---	---	---	---	---	2 - 4	Higher trophic levels	7 and 8	2	4
7440-22-4	Silver	mg/kg	1	---	0.5	---	4.5	---	4.5	AET	5	1	4.5
7440-28-0	Thallium	mg/kg	---	---	---	---	---	---	0.858	2% LB25	9	0.858	0.858
7440-61-1	Uranium	mg/kg	---	---	---	---	---	---	100	PNEC	10	100	
7440-62-2	Vanadium	mg/kg	---	---	---	---	---	---	---	---		---	---
7440-66-6	Zinc	mg/kg	120	459	120	820	520	---	---	---		120	459

Notes:

ECOPC - Ecological Chemical of Potential Concern, mg/kg - milligram per kilogram
TEC values were used as the selected screening benchmark when available.
ARCS - Assessment and Remediation of Contaminated Sediments
LELs- Lowest Effect Levels
"---" = No applicable screening benchmark
NOAA - National Oceanic and Atmospheric Administration
NOEC - No Observed Effect Concentration
PNEC - Predicted No-Effect Concentration
PRG - Preliminary Remediation Goal
SELs - Severe Effect Levels
SQAGS - sediment quality assessment guidelines
SQUIRTS - screening quick reference tables
TEC - Threshold Effect Concentration
AET - Apparent Effect Threshold
UETs - Upper Effect Levels

TABLE 2-8
Screening-Level Sediment Benchmarks

Sources:

[1a] MacDonald, D.D., C.G. Ingersoll, D.E. Smorong, R.A. Lindskoog, G. Sloane, and T. Biernacki. 2003. Development and Evaluation of Numerical Sediment Quality Assessment Guidelines (SQAGs) for Florida

[1b] MacDonald, D.D., C.G. Ingersoll, and T.A. Berger. 2000a. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Archives of Environmental Contamination and Toxicology 39:20-31.

[2] U.S. National Oceanic and Atmospheric Association (NOAA). 2008. Screening Quick Reference Tables (SQuiRTs). NOAA Office of Response and Restoration Division, NOAA OR&R Report 08-1, Seattle, WA. Available at http://response.restoration.noaa.gov/book_shelf/122_NEW-SQuiRTs.pdf.

[3] Hall, S. and R. Lockwood. 2014. Chronic Toxicity of Boron to freshwater worms and Mussels in a unique test Design. Presented at the 27th Annual Meeting of the Rocky Mountain Chapter of the Society of Environmental Toxicology and Chemistry, Denver CO, April 2014. (IC25 - L. Variegatus and L. siliquoidea)

[4] United States Environmental Protection Agency (USEPA). 2003b. Blackbird Mine Superfund Site Record of Decision, Lemhi County, Idaho. Prepared By USEPA, Region 10.

[5] Cubbage, J., D. Batts, and S. Breidenbach. 1997. Creation and Analysis of Freshwater Sediment Quality Values in Washington State. Washington State Department of Ecology. Olympia, Washington. (Apparent Effect Threshold H. azteca)

[6] Liber K, Doig LE, White-Sobey SL. 2011. Toxicity of uranium, molybdenum, nickel, and arsenic to Hyalella azteca and Chironomus dilutus in water-only and spiked sediment toxicity tests. Ecotoxicology and Environmental Safety, 74(5), 1171-1179. (NOEC 10 day survival and growth H. azteca)

[7] Lemley, A.D. 2002. Selenium assessment in aquatic ecosystems. A guide for Hazard Evaluation and Water Quality Criteria. Springer-Verlag, New York, NY.

[8] Vanderveer, W.D., and S.P. Canton. 1997. Selenium Sediment Toxicity Thresholds and Derivation of a Water Quality Criteria for Freshwater Biota of Western Streams. Environmental Toxicology and

[9] Borgmann, U., V. Cheam, W.P. Norwood, and J.Lechner. 1998. Toxicity and bioaccumulation of thallium in Hyallela azteca, with comparison to other metals and prediction of environmental impact. Env Pollution 99: 105-114. (Threshold is sediment concentration resulting in 2% of the Lethal Body concentration (25) for 4 week Hyallela bioaccumulation test)

[10] Sheppard, S.C., M.I. Sheppard, M.O. Gallerand, B. Sanipelli. 2005. Derivation of ecotoxicity thresholds for uranium. Journal of Environmental Radioactivity 79(1):55-83.

TABLE 2-9
Screening-Level Benchmarks for Surface Water

RI Chemicals of Potential Concern (RI COPCs)			USEPA National Recommended Water Quality Criteria[1]		Idaho Surface Water Quality Standards[2]		Alternative Chronic Value			Site-Specific Water Quality Criteria Calculation	Surface Water Screening Benchmark for Aquatic Life
			Freshwater CCC (Chronic) Criteria		Aquatic Life CCC (Chronic) Criteria					5th Percentile Hardness (mg/L) =	
CAS No.	Analyte	Units	Value	Notes	Value	Notes	Value	Notes	Source	127.2	Value
7429-90-5	Aluminum	mg/L	0.087	f	---		1.37	g	[6]Parametrix 2009	1.91	0.087
7440-36-0	Antimony	mg/L	---		---		1.60		[3]USEPA 1986	--	1.60
7440-38-2	Arsenic, Dissolved	mg/L	0.15		0.15	a	---		---	--	0.15
7440-39-3	Barium	mg/L	---		---		0.57	g	[4]MDEQ 2014 - FCV	0.57	0.57
7440-41-7	Beryllium	mg/L	---		---		0.01	g	[4]MDEQ 2014 - FCV	0.010	0.010
7440-42-8	Boron	mg/L	---		---		7.20		[4]MDEQ 2014 - FCV	--	7.20
7440-43-9	Cadmium, Dissolved	mg/L	0.00025	d	0.0006	c	---		---	0.00029	0.00029
184-540-299	Chromium VI, Dissolved	mg/L	0.011		0.011	a	--		--	0.0110	0.0110
160-658-31	Chromium III, Dissolved	mg/L	0.074	d	0.074	d	--		--	0.0903	0.0903
7440-48-4	Cobalt	mg/L	---		---		0.10		[4]MDEQ 2014 - FCV	--	0.10
7440-50-8	Copper, Dissolved	mg/L	BLM	i	0.011	c	---		---	0.0139	0.0139
7439-89-6	Iron	mg/L	1	f	---		1.00		[3]USEPA 1986	--	1.00
7439-92-1	Lead, Dissolved	mg/L	0.0025	d	0.0025	c	---		---	0.0033	0.0033
7439-96-5	Manganese, Dissolved	mg/L	---		---		1.65	g, h	[5]CDPHE 2009	1.79	1.79
7439-97-6	Mercury, Dissolved	mg/L	0.00077		- -		---		---	--	0.00077
7439-98-7	Molybdenum	mg/L	---		---		3.20		[4]MDEQ 2014 - FCV	--	3.20
7440-02-0	Nickel, Dissolved	mg/L	0.052	d	0.052	c	---		---	0.0637	0.0637
7782-49-2	Selenium	mg/L	0.005	f	0.005	e	---		---	--	0.005
7440-22-4	Silver, Dissolved	mg/L	0.0032	d, b	0.0034	b,c	---		---	0.0052	0.0052
7440-28-0	Thallium	mg/L	---		---		0.0072		[4]MDEQ 2014 - FCV	--	0.0072
7440-61-1	Uranium, Dissolved	mg/L	---		---		1.50	g, h	[5]CDPHE 2009	1.96	1.96
7440-62-2	Vanadium	mg/L	---		---		0.027		[4]MDEQ 2014 - FCV	--	0.027
7440-66-6	Zinc, Dissolved	mg/L	0.12	d	0.12	c	---		---	0.14	0.14

TABLE 2-9
Screening-Level Benchmarks for Surface Water

Notes:

Only the basis upon which the screening benchmark is based is presented here. Data are screened using the appropriate basis (dissolved vs. total).

When Idaho State Standards were available, they were used as the screening benchmark, even if they were not the most conservative benchmark.

"---" = No applicable screening benchmark mg/L - milligram per liter

CCC - Criterion Continuous Concentration (i.e., chronic)

[a] Criteria for these metals are expressed as a function of the water effect ratio (WER), as defined in Subsection 210.03.c.iii of IDAPA 58.01.02.

[b] Silver criteria is acute value, chronic value not available.

[c] Aquatic life criteria for these metals are expressed as a function of total hardness (mg/L as calcium carbonate), the pollutant's water effect ratio (WER) as defined in Subsection 210.03.c.iii of IDAPA 58.01.02 and multiplied by an appropriate dissolved conversion factor as defined in Subsection 210.02. For comparative purposes only, the values displayed in this table are shown as dissolved metal and correspond to a total hardness of one hundred (100) mg/L and a water effect ratio of one (1.0).

[d] The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. The value given here corresponds to a hardness of 100 mg/L. Criteria values for other hardness may be calculated from the following: CCC (dissolved) = exp {mC[ln(hardness)]+bC} (CF).

[e] Criterion is expressed as total recoverable (unfiltered) concentration.

[f] This recommended water quality criterion for selenium is expressed in terms of total recoverable metal in the water column. It is scientifically acceptable to use the conversion factor (0.996- CMC or 0.922-CCC) that was used in the GLI (60FR15393-15399, March 23, 1995; 40CFR132 Appendix A) to convert this to a value that is expressed in terms of dissolved metal.

[g] hardness-based value calculated using 100 mg/L CaCO3.

[h] Metals are stated as dissolved unless otherwise specified.

[i] The current Copper Criteria are based on the Biotic Ligand model (BLM) and requires site specific data inputs to derive the criterin value.

Criteria Sources:

[1] U.S. Environmental Protection Agency (EPA). 2009a. National Recommended Water Quality Criteria (NRWQC) for Priority Pollutants. EPA Office of Water, Office of Science and Technology (4304T). Available at http://www.epa.gov/waterscience/criteria/wqcriteria.html. Updated December 2, 2009.

[2] Idaho Administrative Procedures Act (IDAPA) 58.01.02 water quality standards - IDAPA Numeric Criteria For Toxic Substances For Waters Designated For Aquatic Life, Recreation, Or Domestic Water Supply Use (IDAPA 2010).

[3] U.S. Environmental Protection Agency (EPA). 1986. Quality Criteria for Water 1986 ("The Gold Book"). EPA 440/5-86-001. May 1, 1986.

[4] Michigan Department of Environmental Quality (MDEQ). 2014. Freshwater Chronic Values (FCV) from Rule 57 Water Quality Values based on Rule 323.1057 (Toxic Substances) of the Part 4. Water Quality Standards gives procedures for calculating water quality values to protect humans, wildlife and aquatic life. Updated February 2014.

[5] Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Commission (WQCC). 2007. Reg. Number 32. Classifications and Numeric Standards for the Arkansas River System, updated February 2009. Available at http://www.cdphe.state.co.us/regulations/wqccregs/100232arkansasriverbasinnew.pdf.

[6] Parametrix. 2009. Updated Freshwater Aquatic Life Criteria for Aluminum (Exhibit 2 of Direct Testimony of Robert W. Gensemer, Ph.D.). Prepared for Los Alamos National Laboratory. 25 pp

TABLE 2-10
Fish Tissue TRVs for Tier 2 and Tier 3 Risk Characterization

ECOPC		Fish Tissue (mg/kg dw)					
CAS No.	**Analyte**	**Trout**	**Source**	**Notes**	**Other Fish Species**	**Source**	**Notes**
7429-90-5	Aluminum	33.00	a	Rainbow trout, NOEC concentration 8.53 mg/kg ww	--	--	
7440-36-0	Antimony	19.23	b	Rainbow trout, NOEC survival, 5.0 mg/kg ww	4.23	d	
7440-38-2	Arsenic	3.85	c	Sodium arsenate - NOEC survival 2.0 mg/kg ww, growth NOEC at 1.0 mg/kg ww - rainbow trout whole body, 77 day exposure	6.92	e	Survival and growth - No effect Bluegill
7440-39-3	Barium	--	--	No data	--	--	
7440-41-7	Beryllium	--	--		19.73	f	Bluegill mortality NOEC 5.13 mg/kg ww
7440-42-8	Boron	--	--		4.00	g	Suggest that boron in fish tissue is usually less than 4 mg/kg
7440-43-9	Cadmium	2.08	h	NOEC growth 0.54 - Rainbow trout whole body, 210 day exposure	1.35	I	NOEC survival and growth, bluegill, 180 days
7440-47-3	Chromium	8.85	j	Chromium VI, rainbow trout 2.3 mg/kg ww - NOEC mortality	169.60	k	Killifish ED15, larval fish, growth
7440-48-4	Cobalt	--		Dietary info listed indicates it's an essential element - lower doses increase growth	--	--	
7440-50-8	Copper	6.70	l	Rainbow trout fry growth IC_{10} (6.7 mg/kg dw)	19.54	m	Common Carp larvae NOEC mort (5.08 mg/kg ww)
7439-89-6	Iron	34.62	n	brown trout mortality NOEC egg life stage (9 mg/kg ww)	--	--	
7439-92-1	Lead	15.38	o	Survival NOEC - lead nitrate 4.0 mg/kg ww in carcass (224 day exposure)- rainbow trout	3.46	p	Tilapia lowest value NOEC (0.9 mg/kg ww) growth (muscle tissue)
7439-96-5	Manganese	--	--	No data	--	--	
7439-97-6	Mercury	1.81	q	Mortality no effect, juvenile rainbow trout	3.08	r	FHM, growth, NOEC, 60 days
7439-98-7	Molybdenum	2.77	s	Growth corrected NOEC for rainbow trout (0.72 mg/kg ww)	--	--	
7440-02-0	Nickel	7.69	t	RBT adult NOEC (2 mg/kg ww) biochemical endpoint for plasma	1.54	u	FHM NOEC (0.4 mg/kg ww)
7782-49-2	Selenium	12.48 - 14.14	v	Whole body brown trout effects concentrations translated from the EC10 egg values	--	--	
7440-22-4	Silver	0.78	w	RBT whole body NOEC (0.78 mg/kg dw) mortality & sublethal endpoints	1.46	x	No effect survival and growth FHM (1.46 mg/kg dw)
7440-28-0	Thallium	--	--		0.19	u	FHM NOEC (0.05 mg/kg ww) embryo time to hatch
7440-61-1	Uranium	67.69	y	Brook trout NOEC hatch, survival, growth (17.6 mg/kg ww derived from BCF (1.94) and NOEC for water (9.08 mg/l)	--	--	
7440-62-2	Vanadium	1.58	z	LOED in carcass for growth and morphology immature RBT (0.41 mg/kg dw)	2.62	aa	American Flagfish NOEC (0.68 mg/kg ww) growth, whole body
7440-66-6	Zinc	22.50	bb	Zinc sulfate, survival and growth NOEC whole body (newly hatched larvae) 4.5 mg/kg ww for brook trout. 84 day exposure	130.77	cc	Flagfish growth, no effect, 100 days, larvae to adult

TABLE 2-10
Fish Tissue TRVs for Tier 2 and Tier 3 Risk Characterization

Notes:

ECOPC - Ecological Chemical of Potential Concern, NOEC - No-Observed Effect Concentration, RBT - Rainbow Trout, LOED Lowest Observed Adverse Effects Level, FHM - Fathead Minnow
mg/kg dw - milligram per kilogram dry weight, mg/kg ww - milligram per kilogram wet weight, mg/L - milligram per liter

Wet Weight concentrations converted to dry weight using an assumed moisture content of 74 %.

Whole body tissue concentrations used whenever available.

Sources:

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TABLE 2-11
Screening-Level Surface Soil Benchmarks for Plant and Invertebrate Receptors

RI Chemicals of Potential Concern (RI COPCs)			Plants				Terrestrial Invertebrates			
			EPA EcoSSLs	Efroymson et al. 1997a	Sheppard et al. 2005	Screening Benchmark	EPA EcoSSLs	Efroymson et al. 1997b	Sheppard et al. 2005	Screening Benchmark
CAS No.	Analyte	Units	ECO		PNEC		ECO		PNEC	
Metals and Metalloids										
7429-90-5	Aluminum	mg/kg	*	50	---	***Not a COPC if soil pH > 5.5**	*	---	---	***Not a COPC if soil pH > 5.5**
7440-36-0	Antimony	mg/kg	---	5	---	**5**	78	---	---	**78**
7440-38-2	Arsenic	mg/kg	18	10	---	**18**	---	60	---	**60**
7440-39-3	Barium	mg/kg	---	500	---	**500**	330	---	---	**330**
7440-41-7	Beryllium	mg/kg	---	10	---	**10**	40	---	---	**40**
7440-42-8	Boron	mg/kg	---	0.5	---	**0.5**	---	---	---	**NA**
7440-43-9	Cadmium	mg/kg	32	4	---	**32**	140	20	---	**140**
7440-47-3	Chromium	mg/kg	---	1	---	**1**	---	0.4	---	**0.4**
7440-48-4	Cobalt	mg/kg	13	20	---	**13**	---	---	---	**NA**
7440-50-8	Copper	mg/kg	70	100	---	**70**	80	50	---	**80**
7439-89-6	Iron	mg/kg	---	---	---	**NA**	---	---	---	**NA**
7439-92-1	Lead	mg/kg	120	50	---	**120**	1700	500	---	**1,700**
7439-96-5	Manganese	mg/kg	220	500	---	**220**	450	---	---	**450**
7439-97-6	Mercury	mg/kg	---	0.3	---	**0.3**	---	0.1	---	**0.1**
7439-98-7	Molybdenum	mg/kg	---	2	---	**2**	---	---	---	**NA**
7440-02-0	Nickel	mg/kg	38	30	---	**38**	280	200	---	**280**
7782-49-2	Selenium	mg/kg	0.52	1	---	**0.52**	4.1	70	---	**4.1**
7440-22-4	Silver	mg/kg	560	2	---	**560**	---	---	---	**NA**
7440-28-0	Thallium	mg/kg	---	1	---	**1**	---	---	---	**NA**
7440-61-1	Uranium	mg/kg	---	5	250	**250**	---	---	100	**100**
7440-62-2	Vanadium	mg/kg	---	2	---	**2**	---	---	---	**NA**
7440-66-6	Zinc	mg/kg	160	50	---	**160**	120	200	---	**120**

Notes:

RI - Remedial Investigation, EPA - Environmental Protection Agency, EcoSSL - Ecological Soil Screening Level, mg/kg - milligram per kilogram, PNEC - Predicted No-Effect Concentration

NA: No applicable screening benchmark value

Hierarchy: EcoSSL value selected, if available.

* USEPA Eco-SSL document for Aluminum indicates that: Aluminum toxicity to tested plants and soil invertebrate is associated with soluble aluminum (not total aluminum) in soil. An alternative procedure for screening aluminum in soils is recommended as a practical approach for determining if aluminum in site soils could pose a potential risk to ecological receptors. Potential ecological risks associated with aluminum are identified based on the measured soil pH; aluminum is identified as a COPC only at sites where the soil pH is less than 5.5.

Criteria Sources:

U.S. Environmental Protection Agency (EPA). 2005. Guidance for Developing Ecological Soil Screening Levels (EcoSSLs). EPA Office of Solid Waste and Emergency Response (OSWER), OSWER Directive 9285.7-55. Published November 2003, Revised November 2005 and subsequent contaminant-specific EcoSSL documents.

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TABLE 2-12
Sediment Screening for ECOPC Selection

RI Chemicals of Potential Concern (RI COPCs)					Screening Benchmark (mg/kg dw)	Site-Wide ECOPC including detention ponds and sediment basins?	Site-Wide aquatic habitat ECOPC?
CAS No.	Analyte	Units	Site-Wide Maximum Detected Concentration (mg/kg dw)	Site-Wide Aquatic Habitat Sediments Maximum Detected Concentration (mg/kg dw)			
7429-90-5	Aluminum	mg/kg	29,800	21,700	25,500	**YES**	NO, Does not exceed criteria
7440-36-0	Antimony	mg/kg	3.3	2.2	3	**YES**	NO, Does not exceed criteria
7440-38-2	Arsenic	mg/kg	170	22.7	9.8	**YES**	**YES**
7440-39-3	Barium	mg/kg	236	212	20	**YES**	**YES**
7440-41-7	Beryllium	mg/kg	1.6	1.6	---	Uncertain	Uncertain
7440-42-8	Boron	mg/kg	79.3	38.7	---	Uncertain	Uncertain
7440-43-9	Cadmium	mg/kg	42.9	42.9	1	**YES**	**YES**
7440-47-3	Chromium	mg/kg	647	387	43	**YES**	**YES**
7440-48-4	Cobalt	mg/kg	13.5	11.7	50	NO, Does not exceed criteria	NO, Does not exceed criteria
7440-50-8	Copper	mg/kg	117	65.4	32	**YES**	**YES**
7439-89-6	Iron	mg/kg	31,600	25,000	20,000	**YES**	**YES**
7439-92-1	Lead	mg/kg	27.3	27.3	36	NO, Does not exceed criteria	NO, Does not exceed criteria
7439-96-5	Manganese	mg/kg	5,720	5,720	460	**YES**	**YES**
7439-97-6	Mercury	mg/kg	0.45	0.26	0.18	**YES**	**YES**
7439-98-7	Molybdenum	mg/kg	27	16	---	Uncertain	Uncertain
7440-02-0	Nickel	mg/kg	295	277	23	**YES**	**YES**
7782-49-2	Selenium	mg/kg	2,040	96.7	2	**YES**	**YES**
7440-22-4	Silver	mg/kg	5	3.6	1	**YES**	**YES**
7440-28-0	Thallium	mg/kg	1.7	1.1	---	Uncertain	Uncertain
7440-61-1	Uranium	mg/kg	39.9	35.3	100	NO, Does not exceed criteria	NO, Does not exceed criteria
7440-62-2	Vanadium	mg/kg	424	206	---	Uncertain	Uncertain
7440-66-6	Zinc	mg/kg	1,280	1,280	120	**YES**	**YES**

Notes:

ECOPC - Ecological Chemical of Potential Concern, RI - Remedial Investigation, mg/kg dw - milligram per kilogram dry weight

Aquatic habitat sediments are those collected within intermittent or perennial channels where habitat for aquatic receptors is found.

Aquatic habitat sediments do not include sediments from sediment or detention basins or overbank out of channel samples.

TABLE 2-13
Surface Water Screening for ECOPC Selection

RI Chemicals of Potential Concern (RI COPCs)		Site-Wide Maximum Dectected Concentration	Site-Wide Aquatic Habitat Maximum Detected Concentration	Surface Water Screening Benchmark for Aquatic Life	Sitewide ECOPC?	Sitewide Aquatic Habitat ECOPC?
CAS No.	Analyte	(mg/L)	(mg/L)	(mg/L)		
7429-90-5	Aluminum	18.1	7.4	0.087	***Yes***	**Yes**
7440-36-0	Antimony, Dissolved	0.00137	0.0011	1.60	No	No
7440-38-2	Arsenic, Dissolved	0.405	0.266	0.15	***Yes***	**Yes**
7440-39-3	Barium	0.301	0.301	0.57	No	No
7440-41-7	Beryllium	0.00095	0.00039	0.010	No	No
7440-42-8	Boron	0.49	0.0832	7.2	No	No
7440-43-9	Cadmium, Dissolved	0.0268	0.0332	0.00	***Yes***	**Yes**
160-658-31	Chromium III, Dissolved[1]	0.00986	0.00985	0.09	No	No
184-540-299	Chromium VI, Dissolved[1]	0.00986	0.00985	0.01	No	No
7440-48-4	Cobalt	0.0046	0.00184	0.10	No	No
7440-50-8	Copper, Dissolved	0.00511	0.0015	0.01	No	No
7439-89-6	Iron	15	5.75	1.00	***Yes***	**Yes**
7439-92-1	Lead, Dissolved	0.00073	0.00062	0.00	No	No
7439-96-5	Manganese, Dissolved	0.942	0.942	1.79	No	No
7439-97-6	Mercury, Dissolved[2]	0.000072	<0.000072	0.00077	No	No
7439-98-7	Molybdenum	0.306	0.161	3.20	No	No
7440-02-0	Nickel, Dissolved	0.521	0.521	0.0637	***Yes***	**Yes**
7782-49-2	Selenium	7.014	6.62	0.005	***Yes***	**Yes**
7440-22-4	Silver, Dissolved	0.00011	0.00007	0.0052	No	No
7440-28-0	Thallium	0.00052	0.000235	0.0072	No	No
7440-61-1	Uranium, Dissolved	0.0429	0.0429	1.96	No	No
7440-62-2	Vanadium	0.0966	0.0106	0.027	***Yes***	No
7440-66-6	Zinc, Dissolved	1.63	1.63	0.14	***Yes***	**Yes**

Notes:

ECOPC - Ecological Chemical of Potential Concern, RI - Remedial Investigation, mg/L - milligram per liter

Aquatic habitat surface water samples are those collected within intermittent or perennial channels where habitat for aquatic receptors is found and includes data from springs in/adjacent to the channels.

[1] - Maximum detected concentrations of total chromium used due to small sample size for speciated chromium.
detected concentrations of Cr (total) were greater.

[2] - Mercury was not detected. The maximum detection limit was used for screening purposes.

TABLE 2-13
Surface Water Screening for ECOPC Selection

Criteria Sources:

[1]U.S. Environmental Protection Agency (EPA). 2009. National Recommended Water Quality Criteria (NRWQC) for Priority Pollutants. EPA Office of Water, Office of Science and Technology (4304T). Available at http://www.epa.gov/waterscience/criteria/wqcriteria.html. Updated December 2, 2009.

[2]Idaho Administrative Procedures Act (IDAPA) 58.01.02 water quality standards - IDAPA Numeric Criteria For Toxic Substances For Waters Designated For Aquatic Life, Recreation, Or Domestic Water Supply Use (IDAPA 2010).

[3]U.S. Environmental Protection Agency (EPA). 1986. Quality Criteria for Water 1986 ("The Gold Book"). EPA 440/5-86-001. May 1, 1986.

[4]Michigan Department of Environmental Quality (MDEQ). 2009. Freshwater Chronic Values (FCV) from Rule 57 Water Quality Values based on Rule 323.1057 (Toxic Substances) of the Part 4. Water Quality Standards gives procedures for calculating water quality values to protect humans, wildlife and aquatic life. http://www.michigan.gov/deq/0,1607,7-135-3313_3686_3728-11383--,00.html. Updated December 11, 2009.

[5]Chapman, P.M., H. Bailey, and E. Canaria. 2000. Toxicity of Total Dissolved Solids Associated with Two Mine Effluents to Chironomid Larvae and Early Lifestages of Rainbow Trout. Environmental Toxicology and Chemistry: Vol. 19, No. 1, pp. 210–214.

[6]Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Commission (WQCC). 2007. Reg. Number 32. Classifications and Numeric Standards for the Arkansas River System, updated February 2009. Available at http://www.cdphe.state.co.us/regulations/wqccregs/100232arkansasriverbasinnew.pdf.

TABLE 2-14
Fish Tissue Screening of Maximum ECOPCs

ECOPC	Maximum Detected Concentration	Fish Tissue TRV	ECOPC
Analyte	**(mg/kg dw)**	**(mg/kg dw)**	
Aluminum	716	33	***Yes***
Antimony	0.96	4.23	No
Arsenic	1.41	3.85	No
Barium	15	--	Uncertain
Beryllium	0.036	19.73	No
Boron	1.1	4	No
Cadmium	2	1.35	***Yes***
Chromium	14.86	8.85	***Yes***
Cobalt	0.47	--	Uncertain
Copper	39.7	6.7	***Yes***
Iron	488	34.62	***Yes***
Lead	0.37	3.46	No
Manganese	59	--	Uncertain
Mercury	0.40	1.81	No
Molybdenum	0.59	2.77	No
Nickel	3.64	1.54	***Yes***
Selenium	35.7	12.48	***Yes***
Silver	0.09	0.78	No
Thallium	0.14	0.19	No
Uranium	1.73	67.7	No
Vanadium	2.79	1.58	***Yes***
Zinc	232	22.5	***Yes***

Notes:

ECOPC - Ecological Chemical of Potential Concern, mg/kg dw - milligram per kilogram dry weight,
TRV - Toxicity Reference Value, "--" = Not Available

TABLE 2-15
Surface Soil Screening for Plant and Invertebrate ECOPC Selection

RI Chemicals of Potential Concern (RI COPCs)			Samples	Detected Concentration		Overall Minimum	Overall Maximum	Frequency Detection Analysis	Soil Screening Benchmark - Plants	Soil Screening Benchmark - Inverts	Most Conservative Soil Screening Benchmark	Site-Wide ECOPC?
CAS No.	Analyte	Units	Detection Frequency	Min	Max							
Metals and Metalloids												
7429-90-5	Aluminum	mg/kg dw	100%	6,960	31,300	6,960	31,300	>5%D	Not a COPC if soil pH > 5.5			Uncertain
7440-36-0	**Antimony**	mg/kg dw	97%	0.014	5.1	0.014	5.1	>5%D	5	78	5	**YES**
7440-38-2	**Arsenic**	mg/kg dw	100%	2.3	53.7	2.3	53.7	>5%D	18	60	18	**YES**
7440-39-3	**Barium**	mg/kg dw	100%	30.6	383	30.6	383	>5%D	500	330	330	**YES**
7440-41-7	Beryllium	mg/kg dw	100%	0.32	1.7	0.32	1.7	>5%D	10	40	10	NO, Does not exceed criteria
7440-42-8	**Boron**	mg/kg dw	100%	7.2	64.5	7.2	64.5	>5%D	0.5	NA	0.5	**YES**
7440-43-9	**Cadmium**	mg/kg dw	100%	0.52	66.1	0.52	66.1	>5%D	32	140	32	**YES**
7440-47-3	**Chromium**	mg/kg dw	100%	15.4	706	15.4	706	>5%D	1	0.4	0.4	**YES**
7440-48-4	**Cobalt**	mg/kg dw	100%	1.9	14	1.9	14	>5%D	13	NA	13	**YES**
7440-50-8	**Copper**	mg/kg dw	100%	10.1	120	10.1	120	>5%D	70	80	70	**YES**
7439-89-6	Iron	mg/kg dw	100%	6,390	31,800	6,390	31,800	>5%D	NA	NA	NA	No Criteria
7439-92-1	Lead	mg/kg dw	100%	5.5	22	5.5	22	>5%D	120	1,700	120	NO, Does not exceed criteria
7439-96-5	**Manganese**	mg/kg dw	100%	166	4,340	166	4,340	>5%D	220	450	220	**YES**
7439-97-6	**Mercury**	mg/kg dw	88%	0.011	0.56	0.011	0.56	>5%D	0.3	0.1	0.1	**YES**
7439-98-7	**Molybdenum**	mg/kg dw	100%	0.43	28.8	0.43	28.8	>5%D	2	NA	2	**YES**
7440-02-0	**Nickel**	mg/kg dw	100%	6.7	260	6.7	260	>5%D	38	280	38	**YES**
7782-49-2	**Selenium**	mg/kg dw	100%	0.069	245	0.069	245	>5%D	0.52	4.1	0.52	**YES**
7440-22-4	Silver	mg/kg dw	100%	0.05	4.8	0.05	4.8	>5%D	560	NA	560	NO, Does not exceed criteria
7440-28-0	**Thallium**	mg/kg dw	100%	0.18	1.4	0.18	1.4	>5%D	1	NA	1	**YES**
7440-61-1	**Uranium**	mg/kg dw	100%	0.56	91.5	0.56	91.5	>5%D	5	NA	5	**YES**
7440-62-2	**Vanadium**	mg/kg dw	100%	16.2	456	16.2	456	>5%D	2	NA	2	**YES**
7440-66-6	**Zinc**	mg/kg dw	100%	53.6	1,240	53.6	1,240	>5%D	160	120	120	**YES**

Notes:

ECOPC - Ecological Chemical of Potential Concern, RI - Remedial Investigation, mg/kg dw - milligram per kilogram on dry weight, ND - non-detect

NA: No applicable screening benchmark value

> 5%D = greater than 5% detection frequency

< 5%D = less than 5% detection frequency

Sediment sampling locations were separated into “dry sediment” locations and “wet sediment” locations to distinguish between locations that are perennially dry (and thus function ecologically like soil) and those locations that have water permanently or ephemerally through the year - dry sediment and soils data are combined in this analysis.

Includes concentration data from samples of all available depths, from both terrestrial and riparian areas.

TABLE 2-16
Dietary Inputs to Wildlife Exposure Assessment Model

Receptor Groups (Trophic Level / Guild)	Potential Representative Receptors	Percent of Dietary Intake Estimated for Prey Item Data Source[1]													Notes
		Surface Water	Terrestrial Soil	Riparian Soil	Sediment	Terrestrial Plants	Riparian Plants	Aquatic Plants	Terrestrial Insects	Riparian Insects	Aquatic Invertebrates	Fish	Terrestrial Small Mammals	Riparian Small Mammals	
Terrestrial Ecosystems															
1° Consumers – Terrestrial Herbivorous Birds	Chipping sparrow (*Spizella passerina)* [Surrogate = Northern Bobwhite (*Colinus virginianus*)]		**SIR**			**85.6%**			**14.4%**						Drinking water from food source
1° Consumers – Terrestrial Herbivorous Mammals	Black-tailed jackrabbit (*Lepus californicus)* [Surrogate = Eastern Cottontail (*Sylvilagus floridanus*)]		**SIR**			**100%**									Drinking water from food source
	Mule Deer (*Odocoileus hemionus*)	**WIR**	**SIR**			**100%**									
2° Consumers – Terrestrial Omnivorous Birds	American Robin (*Turdus migratorius)*		**SIR**			**50%**			**50%**						Drinking water from food source
2° Consumers – Terrestrial Omnivorous Mammals	Deer Mouse (*Peromyscus maniculatus)*		**SIR**			**54.5%**			**45.5%**						Drinking water from food source
3° Consumers – Terrestrial Carnivorous Mammals	Coyote (*Canis latrans)*	**WIR**	**SIR**			**4.0%**			**6.0%**				**90%**		
3° Consumers – Raptors	Northern Harrier (*Circus cyaneus*)		**SIR**						**2.5%**				**97.5%**		Drinking water from food source
Aquatic and Riparian Ecosystems															
1° Consumers – Aquatic and Riparian Herbivorous Birds	Song Sparrow *(Melospiza melodia)*			**SIR**			**100%**								Drinking water from food source
1° Consumers – Aquatic and Riparian Herbivorous Mammals	Long-tailed Vole (*Microtus longicaudus)* [Surrogate = Meadow vole *(Microtus pennsylvanicus*)]			**SIR**			**98.0%**			**2.0%**					Drinking water from food source
2° Consumers – Aquatic and Riparian Omnivorous Birds	Red-winged blackbird (*Agelaius phoeniceus)*			**SIR**			**78.5%**			**21.5%**					Drinking water from food source
2° Consumers – Aquatic and Riparian Piscivorous Birds	Belted kingfisher *(Megaceryle alcyon)*	**WIR**			**SIR**							**100%**			
2° Consumers – Aquatic and Riparian Benthic-feeding Birds	Mallard (*Anas platyrhynchas)*	**WIR**			**SIR**			**24.5%**			**75.5%**				
2° Consumers – Aquatic and Riparian Omnivorous Mammals	Raccoon (*Procyon lotor)*	**WIR**		**SIR**	**SIR**		**27.0%**	**27.0%**			**35.1%**	**1.8%**		**9.1%**	
2° Consumers – Aquatic and Riparian Carnivorous Mammals	Mink (*Mustela vison)*	**WIR**		**SIR**	**SIR**		**3.9%**	**3.9%**			**6.4%**	**81.2%**		**4.7%**	

Notes:

1° - primary trophic level
2° - secondary trophic level
3° - tertiary trophic level

WIR - water ingestion rate
SIR - soil/sediment ingestion rate

1 - This table identifies how site-specific abiotic and biotic data will be used in exposure assessment intake models. "IR" indicates that an ingestion rate will be used to esimate intake from abiotic media and the percentages indicate dietary percentages for dietary sources as shown in Table 4-5.

TABLE 2-17
Exposure Factors Used in ECOPC Selection

Representative Receptor	Exposure Parameter	Units	Reasonable Maximum Exposure (RME) Value	Reference and Basis of Value
Body Weight				
Northern bobwhite	Body weight	kilograms (kg)	0.191	Robel (1969, as cited in USEPA 1993) based on average body weight of both sexes for three seasons from Kansas
Eastern cottontail	Body weight	kilograms (kg)	1.231	Lord (1963, as cited in USEPA 1993) based on mean for both sexes from Illinois
American robin	Body weight	kilograms (kg)	0.077	Based on the mean body weight of an adult robin from Pennsylvania (Clench and Leberman 1978, as cited in USEPA 1993)
Deer mouse	Body weight	kilograms (kg)	0.021	Millar (1989, as cited in USEPA 1993) based on body weights for both males and females from North America
Mule Deer	Body weight	kilograms (kg)	58.99	Average of both sexes (Mackie et al. 1982 as cited in Sample et al. 1997)
Song sparrow	Body weight	kilograms (kg)	0.0235	Smith and Arcese (1988)
Meadow vole	Body weight	kilograms (kg)	0.037	Myers and Krebs (1971, as cited in USEPA 1993) based on average body weights of males and females from collections made all year from south Indiana
Red-winged blackbird	Body weight	kilograms (kg)	0.043	Beletsky (1996)
Belted kingfisher	Body weight	kilograms (kg)	0.136	Based on the lowest average body weight of breeding adult kingfishers from Pennsylvania or Ohio (Brooks and Davis 1987, as cited in EPA 1993)
Mallard duck	Body weight	kilograms (kg)	1.134	Nelson and Martin (1953, as cited in USEPA 1993) based on average of mean body weights for both males and females from throughout the U.S.
Raccoon	Body weight	kilograms (kg)	6.7	Sanderson (1984, as cited in USEPA 1993) based on mean body weights of wild caught males and females from Illinois
Mink	Body weight	kilograms (kg)	0.852	Mitchell (1961, as cited in USEPA 1993) based on the average of mean body weights for both males and females for summer and fall from Montana
Coyote	Body weight	kilograms (kg)	10.5	Based on females from Minnesota (Windberg and others 1997; Berg and Chesness 1978)
Northern harrier	Body weight	kilograms (kg)	0.513	Bildstein (1988, as cited in MacWhirter and Bildstein 1996)
Dietary Composition				
Northern bobwhite	Dietary composition	percent (%)	85.6% Vegetation; 14.4% invertebrates	Handley (1931, as cited in USEPA 1993), based on average percentage from birds in the southeastern United States
Eastern cottontail	Dietary composition	percent (%)	100% Vegetation	USEPA (1993)
American robin	Dietary composition	percent (%)	50% Vegetation and 50% invertebrates	USEPA (1993)
Deer mouse	Dietary composition	percent (%)	54.5% Vegetation and 45.5% invertebrates	Flake (1973, as cited in USEPA 1993), based on average of four seasons diet for mice from Colorado short grass prairie
Mule Deer	Dietary composition	percent (%)	100% Vegetation	Sample et al. 1997
Song sparrow	Dietary composition	percent (%)	Primarily herbivorous and granivorous; may consume insects and other invertebrates during yolk formation	University of Michigan (2000)
Meadow vole	Dietary composition	percent (%)	98% Vegetation and 2% invertebrates	Lindroth and Batzli (1984, as cited in USEPA 1993), based on average of two studies during four seasons in Illinois
Red-winged blackbird	Dietary composition	percent (%)	90% Plant material, seeds, and grains in fall and winter, 70% insects and 17% grain during the breeding season	Diet during fall and winter taken from Bent (1985), Martin and others (1961), and Crase and DeHaven (1978), all as cited in Zeiner and others (1990). Diet of males and females during breeding season in agricultural and nonagricultural land in Ontario, Canada
Belted kingfisher	Dietary composition	percent (%)	Primarily fish-eating; may consume crayfish and other invertebrates	EPA (1993)
Mallard duck	Dietary composition	percent (%)	25.3% Vegetation and 74.7% invertebrates	Swanson and others (1985, as cited in USEPA 1993), based on spring breeding season in south- central North Dakota prairie pothole area
Raccoon	Dietary composition	percent (%)	48.48% Vegetation, 31.78% invertebrates, 9.28% mammals, 6.33% reptiles/amphibians, 1.75% fish, 1.5% birds, and 0.91% other not identified	Tabatabai and Kennedy (1988) and Hamilton (1951), all as cited in USEPA (1993), based on average of percent wet volume of digestive tract or stomach contents of raccoons from Tennessee (four seasons) and New York (summer only)
Mink	Dietary composition	percent (%)	54% Trout, 19% other fish, 7.5% invertebrates. 2.5% amphibians, 5.5% birds and mammals, 9% vegetation, and 2.5% unidentified	Alexander (1977, as cited in USEPA 1993), based on stomach contents for four seasons from Michigan streams and rivers.
Coyote	Dietary composition	percent (%)	90% Mice, rats, rabbits, squirrels, and carrion. Some deer and ground nesting birds. Various fruits, berries, seeds, and grasses consumed when available	Omnivorous based on http://www.ukans.edu/~mammals/canis - latr.html
Northern harrier	Dietary composition	percent (%)	80% Mammals, 15% birds, 3% reptiles and amphibians, and 2% invertebrates	Bildstein (1987), based on pellet content in the northern part of the harrier range and another study by Brown and Amadon (1968)

TABLE 2-17
Exposure Factors Used in ECOPC Selection

Representative Receptor	Exposure Parameter	Units	Reasonable Maximum Exposure (RME) Value	Reference and Basis of Value
Food Ingestion Rate (dry weight)				
Northern bobwhite	Food ingestion rate[1]	grams per grams BW per day (g/g-day)	0.095	Calculated using the ingestion rate equation for omnivorous birds from Nagy 2001 (FIR = (0.67*BW^0.627)/BW)
Eastern cottontail	Food ingestion rate[1]	grams per grams BW per day (g/g-day)	0.061	Calculated using the ingestion rate equation for herbivorous mammals from Nagy 2001 (FIR = (0.859*BW^0.628)/BW)
American robin	Food ingestion rate[1]	grams per grams BW per day (g/g-day)	0.21	Calculated using the specific ingestion rate for Robins (DMI) from Nagy 2001 based on the 18.7 g BW cited in Nagy 2001 (FIR = 3.96/18.7)
Deer mouse	Food ingestion rate[1]	grams per grams BW per day (g/g-day)	0.21	Calculated using the specific ingestion rate for the deer mouse (DMI) from Nagy 2001 based on the 17.9 g BW cited in Nagy 2001 (FIR = 3.81/17.9)
Mule deer	Food ingestion rate[1]	grams per grams BW per day (g/g-day)	0.04	Calculated using the specific ingestion rate for Mule deer (DMI) from Nagy 2001 based on the 39,100 g BW cited in Nagy 2001 (FIR = 1565/39100)
Song sparrow	Food ingestion rate[1]	grams per grams BW per day (g/g-day)	0.24	Calculated using the ingestion rate equation for all birds from Nagy 2001 (FIR = (0.638*BW^0.685)/BW)
Meadow vole	Food ingestion rate[1]	grams per grams BW per day (g/g-day)	0.31	Calculated using the specific ingestion rate for the Meadow vole (DMI) from Nagy 2001 based on the 36.9 g BW cited in Nagy 2001 (FIR = 11.5/36.9)
Red-winged blackbird	Food ingestion rate[1]	grams per grams BW per day (g/g-day)	0.16	Calculated using the ingestion rate equation for omnivorous birds from Nagy 2001 (FIR = (0.67*BW^0.627)/BW)
Belted kingfisher	Food ingestion rate	g/g BW/day	0.588	Value shown is calculated using conservative body weight in an allometric equation for all birds, food requirements for carnivores (Nagy 2001)
Mallard duck	Food ingestion rate[1]	grams per grams BW per day (g/g-day)	0.07	Calculated using the ingestion rate equation for all birds from Nagy 2001 (FIR = (0.638*BW^0.685)/BW)
Raccoon	Food ingestion rate[1]	grams per grams BW per day (g/g-day)	0.025	Calculated using the ingestion rate equation for omnivorous mammals from Nagy 2001 (FIR = (0.432*BW^0.678)/BW)
Mink	Food ingestion rate[1]	grams per grams BW per day (g/g-day)	0.05	Calculated using the ingestion rate equation for carnivorous mammals from Nagy 2001 (FIR = (0.153*BW^0.834)/BW)
Coyote	Food ingestion rate[1]	grams per grams BW per day (g/g-day)	0.033	Calculated using the ingestion rate equation for carnivorous mammals from Nagy 2001 (FIR = (0.153*BW^0.834)/BW)
Northern harrier	Food ingestion rate[1]	grams per grams BW per day (g/g-day)	0.1	Calculated using the ingestion rate equation for carnivorous birds from Nagy 2001 (FIR = (0.849*BW^0.663)/BW)
Water Ingestion Rate				
Northern bobwhite	Water ingestion rate	kilograms per kilograms BW per day (kg/kg-day)	0.102	Value shown is based on the following equation: IRwater = (0.059 x BW(kg)^0.67)/BW(kg) (USEPA 1993)
Eastern cottontail	Water ingestion rate	kilograms per kilograms BW per day (kg/kg-day)	0.097	Value shown is based on the following equation: IRwater = (0.099 x BW(kg)^0.9)/BW(kg) (USEPA 1993)
American robin	Water ingestion rate	kilograms per kilograms BW per day (kg/kg-day)	0.138	Value shown is based on the following equation: IRwater = (0.059 x BW(kg)^0.67)/BW(kg) (USEPA 1993)
Deer mouse	Water ingestion rate	kilograms per kilograms BW per day (kg/kg-day)	0.146	Value shown is based on the following equation: IRwater = (0.099 x BW(kg)^0.9)/BW(kg) (USEPA 1993)
Mule Deer	Water ingestion rate	kilograms per kilograms BW per day (kg/kg-day)	0.066	Value shown is based on the following equation: IRwater = (0.099 x BW(kg)^0.9)/BW(kg) (USEPA 1993)

TABLE 2-17
Exposure Factors Used in ECOPC Selection

Representative Receptor	Exposure Parameter	Units	Reasonable Maximum Exposure (RME) Value	Reference and Basis of Value
Song sparrow	Water ingestion rate	kilograms per kilograms BW per day (kg/kg-day)	0.205	Value shown is based on the following equation: IRwater = (0.059 x BW(kg)^0.67)/BW(kg) (USEPA 1993)
Meadow vole	Water ingestion rate	kilograms per kilograms BW per day (kg/kg-day)	0.138	Value shown is based on the following equation: IRwater = (0.099 x BW(kg)^0.9)/BW(kg) (USEPA 1993)
Red-winged blackbird	Water ingestion rate	kilograms per kilograms BW per day (kg/kg-day)	0.167	Value shown is based on the following equation: IRwater = (0.059 x BW(kg)^0.67)/BW(kg) (USEPA 1993)
Belted kingfisher	Water ingestion rate	g/g BW/day	0.11	Value shown is based on the following equation: IRwater = 0.059 x BW(kg)0.67 (EPA 1993)
Mallard duck	Water ingestion rate	kilograms per kilograms BW per day (kg/kg-day)	0.057	Value shown is based on the following equation: IRwater = (0.059 x BW(kg)^0.67)/BW(kg) (USEPA 1993)
Raccoon	Water ingestion rate	kilograms per kilograms BW per day (kg/kg-day)	0.082	Value shown is based on the following equation: IRwater = (0.099 x BW(kg)^0.9)/BW(kg) (USEPA 1993)
Mink	Water ingestion rate	kilograms per kilograms BW per day (kg/kg-day)	0.1	Value shown is based on the following equation: IRwater = (0.099 x BW(kg)^0.9)/BW(kg) (USEPA 1993)
Coyote	Water ingestion rate	kilograms per kilograms BW per day (kg/kg-day)	0.078	Value shown is based on the following equation: IRwater = (0.099 x BW(kg)^0.9)/BW(kg) (USEPA 1993)
Northern harrier	Water ingestion rate	kilograms per kilograms BW per day (kg/kg-day)	0.074	Value shown is based on the following equation: IRwater = (0.059 x BW(kg)^0.67)/BW(kg) (USEPA 1993)
Soil/Sediment Ingestion Rate				
Northern bobwhite	Soil/sediment ingestion rate[1]	grams per grams BW per day (g/g-day)	0.0019	Value from the AWERA representative of estimated soil ingestion for a generic omnivorous receptor
Eastern cottontail	Soil/sediment ingestion rate[1]	grams per grams BW per day (g/g-day)	0.0015	Ingestion of soil (Isoil) as percentage of food intake reported at 2.4% for herbivores (Beyer 1994)
American robin	Soil/sediment ingestion rate[1]	grams per grams BW per day (g/g-day)	0.0027	Value from the AWERA representative of estimated soil ingestion for a generic omnivorous receptor
Deer mouse	Soil/sediment ingestion rate[1]	grams per grams BW per day (g/g-day)	0.0032	Deer mouse consumption habits are assumed to be similar to those of the white-footed mouse. Ingestion of soil (Isoil) as percentage of food intake reported at 2% for the white-footed mouse (Beyer 1994)
Mule Deer	Soil/sediment ingestion rate[1]	grams per grams BW per day (g/g-day)	0.0003	Ingestion of soil (Isoil) as percentage of food intake reported at < 2% (Beyer 1994)
Song sparrow	Soil/sediment ingestion rate[1]	grams per grams BW per day (g/g-day)	0.0048	Value from the AWERA representative of estimated soil ingestion for a generic omnivorous receptor
Meadow vole	Soil/sediment ingestion rate[1]	grams per grams BW per day (g/g-day)	0.0054	Ingestion of soil (Isoil) as percentage of food intake reported at 2.4% for the meadow vole (Beyer 1994)
Red-winged blackbird	Soil/sediment ingestion rate[1]	grams per grams BW per day (g/g-day)	0.0032	Value from the AWERA representative of estimated soil ingestion for a generic omnivorous receptor
Belted kingfisher	Soil/sediment ingestion rate	g/g BW/day	0.0011	Ingestion of sediment as percentage of food intake based on 0.7 percent of IR, which is based on studies of the bald eagle (Pascoe and others 1996)
Mallard duck	Soil/sediment ingestion rate[1]	grams per grams BW per day (g/g-day)	0.0023	Ingestion of sediment (Ised) as percentage of food intake reported at 3.3% for the mallard (Beyer 1994)
Raccoon	Soil/sediment ingestion rate[1]	grams per grams BW per day (g/g-day)	0.0024 (0.0012 from sediment and 0.0012 from riparian soil)	Ingestion of soil/sediment (Isoil/sed) as percentage of food intake reported at 9.4% for the raccoon (Beyer 1994)

TABLE 2-17
Exposure Factors Used in ECOPC Selection

Representative Receptor	Exposure Parameter	Units	Reasonable Maximum Exposure (RME) Value	Reference and Basis of Value
Mink	Soil/sediment ingestion rate[1]	grams per grams BW per day (g/g-day)	0.0047 (0.00235 from sediment and 0.00235 from riparian soil)	Mink food consumption habits are assumed to be similar to those of the raccoon. Ingestion of soil/sediment (Isoil/sed) as percentage of food intake reported at 9.4% for the raccoon (Beyer 1994)
Coyote	Soil/sediment ingestion rate[1]	grams per grams BW per day (g/g-day)	0.0009	Coyote food consumption habits are assumed to be similar to those of the red fox. Based on ingestion of soil (Isoil) as percentage of food intake reported at 2.8% for the red fox (Beyer 1994)
Northern harrier	Soil/sediment ingestion rate[1]	grams per grams BW per day (g/g-day)	0.0007	Harrier food consumption habits are assumed to be similar to those of bald eagles. Based on 0.7% of estimated sediment ingestion rate for the bald eagle in Pascoe and others (1996)
Home Range				
Northern bobwhite	Home range	acres (ac)	28.61	EPA 1993, based on average of mated and unmated males, nesting and postnesting females from southern Illinois
Eastern cottontail	Home range	acres (ac)	5.96	EPA 1993. Based on average of males and females during summer, spring, and winter in Wisconsin
Mule deer	Home range	acres (ac)	31,424	Mean year-round home range size for deer in the phosphate area of southeast Idaho (Kuck 2003)
American robin	Home range	acres (ac)	0.395	Based on adults of both sexes from New York in dense conifers and unspecified forest (EPA 1993)
Deer mouse	Home range	acres (ac)	0.23	Based on highest mean of female range from Idaho desert area (EPA 1993)
Song sparrow	Home range	acres (ac)	3.34	Based on the home range of adult males and females in Marin County, California (Halliburton and Mewaldt 1976)
Meadow vole	Home range	acres (ac)	0.018	Based on average of both sexes during summer and winter from alluvial bench in Montana (EPA 1993)
Red-winged blackbird	Home range	acres (ac)	0.494	Mean territory size based on observations in uplands and marshlands (Yasukawa and Searcy 1995)
Belted kingfisher	Home range	acres (ac)	5.73	Based on mean territory of both sexes during summer (1.16 km of shoreline x 0.02 km width = 0.0232 km^2; EPA 1993)
Raccoon	Home range	acres (ac)	4,159	Based on mean adult male and female home ranges during the spring and summer in North Dakota prairie pothole area (EPA 1993)
Mink	Home range	acres (ac)	1,532	Based on male and female home ranges in Montana from heavy and sparse vegetation riverine area (EPA 1993)
Coyote	Home range	acres (ac)	7,240	Woodruff and Keller (1982)
Northern harrier	Home range	acres (ac)	642.5	Median home range of eight studies (MacWhirter and Bildstein 1996)

Notes:

BW - body weight IR - ingestion rate

FIR - food ingestion rate

[1] - Food and sediment ingestion rates are presented in g/g BW/day as indicated in Nagy 2001. The units are mathematically equivalent to kg/kg BW/day to be used in SSERA exposure estimations.

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TABLE 2-18
NOAEL TRVs for Bird and Mammal Receptors

Bird						
RI COPC	**Bird (mg/kg-BW/day)**	**Source**	**Endpoint**	**Subchronic/ Chronic**	**Uncertainty Factors**	**Notes**
Aluminum	Not a COPC if soil pH > 5.5	EcoSSL	NA	NA	NA	
Antimony	NA	None Available	NA	NA	NA	
Arsenic	2.24	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Lowest NOAEL
Barium	20.8	AWERA/Sample et al. 1996/USACHPMM	Mortality	Sub-chronic	0.1	Cited as Johnson et al. 1960. EcoSSL notes this as the only applicable study.
Beryllium	NA	None Available	NA	NA	NA	
Boron	28.8	AWERA/Sample et al. 1996/USACHPMM	Reproduction	Chronic	NA	Cited as Smith and Anders, 1989
Cadmium	1.47	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Geometric mean NOAEL.
Chromium	2.66	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Geometric mean NOAEL.
Cobalt	7.61	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Geometric mean NOAEL.
Copper	4.05	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Highest NOAEL < lowest bounded LOAEL.
Iron	NA	None Available	NA	NA	NA	
Lead	1.63	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Highest NOAEL < lowest bounded LOAEL.
Manganese	179	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Geometric mean NOAEL.
Mercury	0.039	AWERA/USACHPPM/Region IX BTAG	Reproduction	Chronic	NA	USEPA (GreatLakes), 1995
Molybdenum	3.5	AWERA/USACHPPM	Reproduction	Chronic	0.1	NOAEL estimated from LOAEL using uncertainty factor
Nickel	6.71	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Geometric mean NOAEL.
Selenium	0.29	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Highest NOAEL < lowest bounded LOAEL.
Silver	2.02	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Lowest LOAEL/10
Thallium	0.35	USACHPPM/LANL	Mortality	Chronic	0.1	Uncertainty factor applied to NOAEL.
Uranium	16	AWERA/USACHPPM/Sample et al. 1996	Mortality, body weight, liver and kidney effects	Sub-chronic	0.1	NOAEL estimated from sub-chronic NOAEL using uncertainty factor. Cited as Haseltine and Sileo. 1983.
Vanadium	0.344	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Highest NOAEL < lowest bounded LOAEL.
Zinc	66.1	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Geometric mean NOAEL.

TABLE 2-18
NOAEL TRVs for Bird and Mammal Receptors

Mammal						
RI COPC	**Mammal (mg/kg-BW/day)**	**Source**	**Endpoint**	**Subchronic/ Chronic**	**Uncertainty Factors**	**Notes**
Aluminum	Not a COPC if soil pH > 5.5	EcoSSL				
Antimony	0.059	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Highest NOAEL < lowest bounded LOAEL.
Arsenic	1.04	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Highest NOAEL < lowest bounded LOAEL.
Barium	51.8	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Geometric mean NOAEL.
Beryllium	0.532	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Lowest NOAEL
Boron	28	AWERA/USACHPPM/LANL/Sample et al. 1996	Reproduction	Chronic	NA	Cited as Weir and Fisher, 1972
Cadmium	0.77	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Highest NOAEL < lowest bounded LOAEL.
Chromium	9.24	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Geometric mean NOAEL.
Cobalt	7.33	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Geometric mean NOAEL.
Copper	5.6	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Highest NOAEL < lowest bounded LOAEL.
Iron	NA	None Available	NA	NA	NA	
Lead	4.7	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Highest NOAEL < lowest bounded LOAEL.
Manganese	51.5	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Geometric mean NOAEL.
Mercury	0.032	USACHPPM/LANL/Sample et al. 1996	Reproduction	Chronic	NA	Lower than NOAEL used in AWERA.
Molybdenum	0.26	AWERA/USACHPPM/Sample et al. 1996	Reproduction	Chronic	0.1	NOAEL estimated from LOAEL using uncertainty factor.
Nickel	1.7	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Highest NOAEL < lowest bounded LOAEL.
Selenium	0.143	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Highest NOAEL < lowest bounded LOAEL.
Silver	6.02	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Lowest LOAEL/10
Thallium	0.48	USACHPPM/LANL/Region IX BTAG	Growth. Reproduction and Survival	Chronic	NA	Cited as PRC, 1994
Uranium	3.07	AWERA/USACHPPM/Sample et al. 1996	Reproduction	Chronic	NA	Cited as Paternain et al. 1989
Vanadium	4.16	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Highest NOAEL < lowest bounded LOAEL.
Zinc	75.4	EcoSSL	Growth. Reproduction and Survival	Chronic	NA	Geometric mean NOAEL.

TABLE 2-18
NOAEL TRVs for Bird and Mammal Receptors

Notes:

The uncertainty factors provided in the table are those used in the cited source to derive the TRVs from the original studies shown in the Notes column.

COPC - Chemical of Potential Concern, mg/kg-BW/day - milligram per kilogram of body weight per day, NOAEL TRV - No Observed Adverse Effects Level Toxicity Reference Value, LOAEL - Lowest-Observed Adverse Effects Level, EcoSSL - Ecological Soil Screening Level

Hierarchy:

1) EcoSSL selected NOAEL TRV.

2) AWERA if supported by other major databases.

3) If more conservative values available than used in AWERA, value supported by multiple major databases used.

4) If no value available in AWERA (thallium), other major databases consulted.

Sources:

(1) EPA Region 9 BTAGs - U.S. Environmental Protection Agency (USEPA). 2009b. Currently Recommended U.S. EPA Region 9 Biological Technical Assistance Group (BTAG) Mammalian and Avian Toxicity Reference Values (TRVs) – Revision Date February 24, 2009. Available at http://www.dtsc.ca.gov/AssessingRisk/upload/Eco_Btag-mammal-bird-TRV-table.pdf (note: .pdf file online says revision date 11/21/2002).

(2) USACHPPM's Terrestrial Toxicity Database - U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM). 2009. Directorate of Toxicology Downloads, USACHPPM TRV database. Available at http://chppm-www.apgea.army.mil/tox/download.aspx. Accessed October 2009.

(3) EcoSSLs - U.S. Environmental Protection Agency (USEPA). 2005. Guidance for Developing Ecological Soil Screening Levels (EcoSSLs). EPA Office of Solid Waste and Emergency Response (OSWER), OSWER Directive 9285.7-55. Published November 2003, Revised November 2005 and subsequent contaminant-specific EcoSSL documents.

(4) Sample et al., 1996 - Sample, B.E., D.M. Opresko, and G.W Suter II, 1996. Toxicological Benchmarks for Wildlife: 1996 Revision. Oak Ridge National Laboratory, Oak Ridge, TN. 227 pp. ES/ER/TM-86/R3.

(5) ADJUSTED values from Final AWERA - TetraTech EM, Inc. (TTEMI). 2002. Final Area Wide Human Health and Ecological Risk Assessment, Selenium Project, Southeast Idaho Phosphate Mining Resource Area. Prepared for Idaho Department of Environmental Quality by TetraTech EM, Inc.

(6) Los Alamos National Laboratory (LANL). 2008. ECORISK Database (Release 2.3), ER package #186. Environmental Programs Directorate, Waster and Environmental Services Division, Los Alamos, NM. ER ID 103352. LA-UR-08-06673. October.

(7) UNADJUSTED values from AWERA Work Plan 2002 - TetraTech EM, Inc. (TTEMI). 2002. Final Area Wide Human Health and Ecological Risk Assessment Work Plan, Selenium Project, Southeast Idaho Phosphate Mining Resource Area. Prepared for Idaho Department of Environmental Quality by TetraTech EM, Inc., April, 2002.

TABLE 2-19
Exposure Screening for Bird and Mammal Receptors

RI Chemicals of Potential Concern (RI COPCs)	Receptor	Exposure (mg/kg-BW/day)				TRV (mg/kg-BW/day)	ECOPC?
		Food	Water	Soil/Sediment	Total		
Aluminum	American Robin	2.55E+02	2.50E+00	8.45E+01	3.42E+02	N/A	Not an ECOPC[1]
	Belted Kingfisher	4.65E+01	1.99E+00	3.28E+01	8.13E+01	N/A	Not an ECOPC[1]
	Coyote	1.43E+01	1.41E+00	2.82E+01	4.39E+01	N/A	Not an ECOPC[1]
	Deer Mouse	2.45E+02	2.64E+00	1.00E+02	3.48E+02	N/A	Not an ECOPC[1]
	Eastern Cottontail	2.06E+01	1.76E+00	4.70E+01	6.93E+01	N/A	Not an ECOPC[1]
	Mallard	3.40E+02	1.03E+00	6.85E+01	4.10E+02	N/A	Not an ECOPC[1]
	Meadow Vole	5.25E+01	2.50E+00	1.37E+02	1.92E+02	N/A	Not an ECOPC[1]
	Mink	5.05E+01	1.81E+00	2.03E+02	2.55E+02	N/A	Not an ECOPC[1]
	Mule Deer	1.35E+01	1.19E+00	9.39E+00	2.41E+01	N/A	Not an ECOPC[1]
	Northern Bobwhite	5.61E+01	1.85E+00	5.95E+01	1.17E+02	N/A	Not an ECOPC[1]
	Northern Harrier	3.71E+01	1.34E+00	2.19E+01	6.04E+01	N/A	Not an ECOPC[1]
	Raccoon	5.92E+01	1.48E+00	1.04E+02	1.64E+02	N/A	Not an ECOPC[1]
	Song Sparrow	8.11E+01	3.71E+00	1.21E+02	2.06E+02	N/A	Not an ECOPC[1]
	Red-Winged Blackbird	8.82E+01	3.02E+00	8.10E+01	1.72E+02	N/A	Not an ECOPC[1]
Antimony	American Robin	4.63E-02	2.10E-04	1.38E-02	6.03E-02	N/A	Uncertain
	Belted Kingfisher	6.21E-02	1.67E-04	3.63E-03	6.59E-02	N/A	Uncertain
	Coyote	5.15E-02	1.19E-04	4.59E-03	5.62E-02	5.90E-02	Not an ECOPC
	Deer Mouse	5.39E-02	2.22E-04	1.63E-02	7.04E-02	5.90E-02	***ECOPC***
	Eastern Cottontail	1.79E-02	1.47E-04	7.65E-03	2.57E-02	5.90E-02	Not an ECOPC
	Mallard	1.99E-02	8.66E-05	7.59E-03	2.76E-02	N/A	Uncertain
	Meadow Vole	4.46E-02	2.10E-04	1.62E-02	6.10E-02	5.90E-02	***ECOPC***
	Mink	4.11E-02	1.52E-04	2.68E-02	6.81E-02	5.90E-02	***ECOPC***
	Mule Deer	1.18E-02	1.00E-04	1.53E-03	1.34E-02	5.90E-02	Not an ECOPC
	Northern Bobwhite	2.59E-02	1.55E-04	9.69E-03	3.58E-02	N/A	Uncertain
	Northern Harrier	1.67E-01	1.12E-04	3.57E-03	1.71E-01	N/A	Uncertain
	Raccoon	5.70E-03	1.25E-04	1.37E-02	1.95E-02	5.90E-02	Not an ECOPC
	Song Sparrow	7.06E-02	3.12E-04	1.44E-02	8.53E-02	N/A	Uncertain
	Red-Winged Blackbird	1.99E-02	2.54E-04	9.60E-03	2.98E-02	N/A	Uncertain
Arsenic	American Robin	1.02E+00	4.18E-02	1.45E-01	1.20E+00	2.24E+00	Not an ECOPC
	Belted Kingfisher	9.17E-02	3.33E-02	1.87E-01	3.12E-01	2.24E+00	Not an ECOPC
	Coyote	1.16E-01	2.36E-02	4.83E-02	1.88E-01	1.04E+00	Not an ECOPC
	Deer Mouse	1.05E+00	4.42E-02	1.72E-01	1.26E+00	1.04E+00	***ECOPC***
	Eastern Cottontail	1.91E-01	2.94E-02	8.06E-02	3.01E-01	1.04E+00	Not an ECOPC
	Mallard	2.55E-01	1.73E-02	3.91E-01	6.63E-01	2.24E+00	Not an ECOPC
	Meadow Vole	9.91E-01	4.18E-02	1.71E-01	1.20E+00	1.04E+00	***ECOPC***
	Mink	8.03E-02	3.03E-02	6.00E-01	7.11E-01	1.04E+00	Not an ECOPC
	Mule Deer	1.25E-01	2.00E-02	1.61E-02	1.61E-01	1.04E+00	Not an ECOPC
	Northern Bobwhite	3.44E-01	3.09E-02	1.02E-01	4.77E-01	2.24E+00	Not an ECOPC
	Northern Harrier	3.41E-01	2.24E-02	3.76E-02	4.01E-01	2.24E+00	Not an ECOPC
	Raccoon	6.84E-02	2.48E-02	3.06E-01	4.00E-01	1.04E+00	Not an ECOPC
	Song Sparrow	2.83E-01	6.21E-02	1.52E-01	4.97E-01	2.24E+00	Not an ECOPC
	Red-Winged Blackbird	6.18E-01	5.06E-02	1.01E-01	7.70E-01	2.24E+00	Not an ECOPC
Barium	American Robin	7.22E+00	4.15E-02	1.03E+00	8.30E+00	2.08E+01	Not an ECOPC
	Belted Kingfisher	9.75E-01	3.31E-02	2.60E-01	1.27E+00	2.08E+01	Not an ECOPC
	Coyote	6.38E-01	2.35E-02	3.45E-01	1.01E+00	5.18E+01	Not an ECOPC
	Deer Mouse	8.53E+00	4.39E-02	1.23E+00	9.80E+00	5.18E+01	Not an ECOPC
	Eastern Cottontail	2.99E+00	2.92E-02	5.75E-01	3.59E+00	5.18E+01	Not an ECOPC
	Mallard	6.75E+00	1.72E-02	5.43E-01	7.31E+00	2.08E+01	Not an ECOPC
	Meadow Vole	7.35E+00	4.15E-02	1.58E+00	8.98E+00	5.18E+01	Not an ECOPC
	Mink	1.09E+00	3.01E-02	2.14E+00	3.26E+00	5.18E+01	Not an ECOPC
	Mule Deer	1.96E+00	1.99E-02	1.15E-01	2.09E+00	5.18E+01	Not an ECOPC
	Northern Bobwhite	4.26E+00	3.07E-02	7.28E-01	5.01E+00	2.08E+01	Not an ECOPC
	Northern Harrier	1.80E+00	2.23E-02	2.68E-01	2.09E+00	2.08E+01	Not an ECOPC
	Raccoon	1.37E+00	2.47E-02	1.09E+00	2.49E+00	5.18E+01	Not an ECOPC
	Song Sparrow	1.18E+01	6.17E-02	1.41E+00	1.32E+01	2.08E+01	Not an ECOPC
	Red-Winged Blackbird	3.67E+00	5.03E-02	9.38E-01	4.66E+00	2.08E+01	Not an ECOPC

TABLE 2-19
Exposure Screening for Bird and Mammal Receptors

RI Chemicals of Potential Concern (RI COPCs)	Receptor	Exposure (mg/kg-BW/day)				TRV (mg/kg-BW/day)	ECOPC?
		Food	Water	Soil/Sediment	Total		
Beryllium	American Robin	8.40E-03	1.31E-03	4.59E-03	1.43E-02	N/A	Uncertain
	Belted Kingfisher	2.34E-03	1.05E-03	1.76E-03	5.15E-03	N/A	Uncertain
	Coyote	4.75E-04	7.41E-04	1.53E-03	2.75E-03	5.32E-01	Not an ECOPC
	Deer Mouse	8.28E-03	1.39E-03	5.44E-03	1.51E-02	5.32E-01	Not an ECOPC
	Eastern Cottontail	9.76E-04	9.22E-04	2.55E-03	4.45E-03	5.32E-01	Not an ECOPC
	Mallard	1.79E-02	5.42E-04	3.68E-03	2.21E-02	N/A	Uncertain
	Meadow Vole	2.64E-03	1.31E-03	9.18E-03	1.31E-02	5.32E-01	Not an ECOPC
	Mink	2.59E-03	9.50E-04	1.18E-02	1.53E-02	5.32E-01	Not an ECOPC
	Mule Deer	6.40E-04	6.27E-04	5.10E-04	1.78E-03	5.32E-01	Not an ECOPC
	Northern Bobwhite	2.18E-03	9.69E-04	3.23E-03	6.38E-03	N/A	Uncertain
	Northern Harrier	1.23E-03	7.03E-04	1.19E-03	3.13E-03	N/A	Uncertain
	Raccoon	3.12E-03	7.79E-04	6.00E-03	9.90E-03	5.32E-01	Not an ECOPC
	Song Sparrow	3.84E-03	5.31E-05	8.16E-03	1.21E-02	N/A	Uncertain
	Red-Winged Blackbird	3.70E-03	1.59E-03	5.44E-03	1.07E-02	N/A	Uncertain
Boron	American Robin	5.23E+00	6.76E-02	1.74E-01	5.47E+00	2.88E+01	Not an ECOPC
	Belted Kingfisher	7.15E-02	5.39E-02	8.72E-02	2.13E-01	2.88E+01	Not an ECOPC
	Coyote	1.61E-01	3.82E-02	5.81E-02	2.57E-01	2.80E+01	Not an ECOPC
	Deer Mouse	5.83E+00	7.15E-02	2.06E-01	6.11E+00	2.80E+01	Not an ECOPC
	Eastern Cottontail	1.63E+00	4.75E-02	9.68E-02	1.78E+00	2.80E+01	Not an ECOPC
	Mallard	1.03E+00	2.79E-02	1.82E-01	1.24E+00	2.88E+01	Not an ECOPC
	Meadow Vole	8.01E+00	6.76E-02	2.41E-01	8.32E+00	2.80E+01	Not an ECOPC
	Mink	1.79E-01	4.90E-02	4.43E-01	6.71E-01	2.80E+01	Not an ECOPC
	Mule Deer	1.07E+00	3.23E-02	1.94E-02	1.12E+00	2.80E+01	Not an ECOPC
	Northern Bobwhite	2.49E+00	5.00E-02	1.23E-01	2.67E+00	2.88E+01	Not an ECOPC
	Northern Harrier	3.21E-01	3.63E-02	4.52E-02	4.02E-01	2.88E+01	Not an ECOPC
	Raccoon	4.38E-01	4.02E-02	2.26E-01	7.04E-01	2.80E+01	Not an ECOPC
	Song Sparrow	6.43E+00	1.37E-02	2.15E-01	6.66E+00	2.88E+01	Not an ECOPC
	Red-Winged Blackbird	4.04E+00	8.18E-02	1.43E-01	4.27E+00	2.88E+01	Not an ECOPC
Cadmium	American Robin	2.16E+00	3.67E-03	1.78E-01	2.34E+00	1.47E+00	***ECOPC***
	Belted Kingfisher	1.30E-01	2.93E-03	4.72E-02	1.80E-01	1.47E+00	Not an ECOPC
	Coyote	9.59E-02	2.07E-03	5.95E-02	1.57E-01	7.70E-01	Not an ECOPC
	Deer Mouse	2.17E+00	3.88E-03	2.12E-01	2.38E+00	7.70E-01	***ECOPC***
	Eastern Cottontail	3.09E-01	2.58E-03	9.92E-02	4.11E-01	7.70E-01	Not an ECOPC
	Mallard	5.14E-01	1.52E-03	9.87E-02	6.14E-01	1.47E+00	Not an ECOPC
	Meadow Vole	1.61E+00	3.67E-03	2.30E-01	1.85E+00	7.70E-01	***ECOPC***
	Mink	1.26E-01	2.66E-03	3.56E-01	4.85E-01	7.70E-01	Not an ECOPC
	Mule Deer	2.03E-01	1.76E-03	1.98E-02	2.24E-01	7.70E-01	Not an ECOPC
	Northern Bobwhite	6.24E-01	2.71E-03	1.26E-01	7.53E-01	1.47E+00	Not an ECOPC
	Northern Harrier	2.31E-01	1.97E-03	4.63E-02	2.79E-01	1.47E+00	Not an ECOPC
	Raccoon	1.34E-01	2.18E-03	1.82E-01	3.18E-01	7.70E-01	Not an ECOPC
	Song Sparrow	8.95E-01	6.68E-03	2.04E-01	1.11E+00	1.47E+00	Not an ECOPC
	Red-Winged Blackbird	1.05E+00	4.44E-03	1.36E-01	1.19E+00	1.47E+00	Not an ECOPC
Chromium	American Robin	3.20E+00	1.44E-02	1.91E+00	5.12E+00	2.66E+00	***ECOPC***
	Belted Kingfisher	9.66E-01	1.14E-02	7.12E-01	1.69E+00	2.66E+00	Not an ECOPC
	Coyote	1.67E-01	8.11E-03	6.35E-01	8.10E-01	9.24E+00	Not an ECOPC
	Deer Mouse	3.16E+00	1.52E-02	2.26E+00	5.43E+00	9.24E+00	Not an ECOPC
	Eastern Cottontail	3.72E-01	1.01E-02	1.06E+00	1.44E+00	9.24E+00	Not an ECOPC
	Mallard	9.35E-01	5.93E-03	1.49E+00	2.43E+00	2.66E+00	Not an ECOPC
	Meadow Vole	5.26E-01	1.44E-02	3.57E+00	4.11E+00	9.24E+00	Not an ECOPC
	Mink	6.70E-01	1.04E-02	4.73E+00	5.41E+00	9.24E+00	Not an ECOPC
	Mule Deer	2.44E-01	6.86E-03	2.12E-01	4.63E-01	9.24E+00	Not an ECOPC
	Northern Bobwhite	8.30E-01	1.06E-02	1.34E+00	2.18E+00	2.66E+00	Not an ECOPC
	Northern Harrier	4.23E-01	7.70E-03	4.94E-01	9.25E-01	2.66E+00	Not an ECOPC
	Raccoon	1.90E-01	8.53E-03	2.42E+00	2.62E+00	9.24E+00	Not an ECOPC
	Song Sparrow	1.46E+00	2.13E-02	3.17E+00	4.66E+00	2.66E+00	***ECOPC***
	Red-Winged Blackbird	8.89E-01	1.74E-02	2.12E+00	3.02E+00	2.66E+00	***ECOPC***

TABLE 2-19
Exposure Screening for Bird and Mammal Receptors

RI Chemicals of Potential Concern (RI COPCs)	Receptor	Exposure (mg/kg-BW/day)				TRV (mg/kg-BW/day)	ECOPC?
		Food	Water	Soil/Sediment	Total		
Cobalt	American Robin	3.02E-01	6.35E-04	3.78E-02	3.40E-01	7.61E+00	Not an ECOPC
	Belted Kingfisher	3.05E-02	5.06E-04	1.49E-02	4.58E-02	7.61E+00	Not an ECOPC
	Coyote	1.35E-02	3.59E-04	1.26E-02	2.65E-02	7.33E+00	Not an ECOPC
	Deer Mouse	3.69E-01	6.72E-04	4.48E-02	4.14E-01	7.33E+00	Not an ECOPC
	Eastern Cottontail	1.44E-01	4.46E-04	2.10E-02	1.65E-01	7.33E+00	Not an ECOPC
	Mallard	1.90E-01	2.62E-04	3.11E-02	2.22E-01	7.61E+00	Not an ECOPC
	Meadow Vole	3.89E-01	6.35E-04	5.02E-02	4.40E-01	7.33E+00	Not an ECOPC
	Mink	3.35E-02	4.60E-04	8.65E-02	1.20E-01	7.33E+00	Not an ECOPC
	Mule Deer	9.44E-02	3.04E-04	4.20E-03	9.89E-02	7.33E+00	Not an ECOPC
	Northern Bobwhite	1.99E-01	4.69E-04	2.66E-02	2.26E-01	7.61E+00	Not an ECOPC
	Northern Harrier	3.22E-02	3.40E-04	9.80E-03	4.23E-02	7.61E+00	Not an ECOPC
	Raccoon	4.19E-02	3.77E-04	4.42E-02	8.64E-02	7.33E+00	Not an ECOPC
	Song Sparrow	5.66E-01	9.43E-04	4.46E-02	6.12E-01	7.61E+00	Not an ECOPC
	Red-Winged Blackbird	1.77E-01	7.68E-04	2.98E-02	2.08E-01	7.61E+00	Not an ECOPC
Copper	American Robin	5.15E+00	3.20E-02	3.24E-01	5.50E+00	4.04E+00	***ECOPC***
	Belted Kingfisher	2.58E+00	2.55E-02	1.29E-01	2.73E+00	4.04E+00	Not an ECOPC
	Coyote	4.46E+01	1.81E-02	1.08E-01	4.48E+01	5.60E+00	***ECOPC***
	Deer Mouse	5.34E+00	3.39E-02	3.84E-01	5.76E+00	5.60E+00	***ECOPC***
	Eastern Cottontail	1.01E+00	2.25E-02	1.80E-01	1.21E+00	5.60E+00	Not an ECOPC
	Mallard	4.01E+00	1.32E-02	2.69E-01	4.29E+00	4.04E+00	***ECOPC***
	Meadow Vole	5.19E+00	3.20E-02	6.05E-01	5.83E+00	5.60E+00	***ECOPC***
	Mink	2.81E+00	2.32E-02	8.20E-01	3.65E+00	5.60E+00	Not an ECOPC
	Mule Deer	6.60E-01	1.53E-02	3.60E-02	7.11E-01	5.60E+00	Not an ECOPC
	Northern Bobwhite	1.79E+00	2.37E-02	2.28E-01	2.04E+00	4.04E+00	Not an ECOPC
	Northern Harrier	1.46E+02	1.72E-02	8.40E-02	1.46E+02	4.04E+00	***ECOPC***
	Raccoon	1.71E+00	1.90E-02	4.19E-01	2.15E+00	5.60E+00	Not an ECOPC
	Song Sparrow	3.31E+00	4.76E-03	5.38E-01	3.85E+00	4.04E+00	Not an ECOPC
	Red-Winged Blackbird	3.08E+00	3.87E-02	3.58E-01	3.48E+00	4.04E+00	Not an ECOPC
Iron	American Robin	2.10E+02	2.07E+00	8.59E+01	2.98E+02	N/A	Uncertain
	Belted Kingfisher	3.17E+01	1.65E+00	3.48E+01	6.81E+01	N/A	Uncertain
	Coyote	1.75E+01	1.17E+00	2.86E+01	4.73E+01	N/A	Uncertain
	Deer Mouse	2.13E+02	2.19E+00	1.02E+02	3.16E+02	N/A	Uncertain
	Eastern Cottontail	3.29E+01	1.46E+00	4.77E+01	8.20E+01	N/A	Uncertain
	Mallard	2.76E+02	8.55E-01	7.27E+01	3.50E+02	N/A	Uncertain
	Meadow Vole	8.26E+01	2.07E+00	1.27E+02	2.12E+02	N/A	Uncertain
	Mink	3.77E+01	1.50E+00	2.04E+02	2.44E+02	N/A	Uncertain
	Mule Deer	2.16E+01	9.90E-01	9.54E+00	3.21E+01	N/A	Uncertain
	Northern Bobwhite	6.38E+01	1.53E+00	6.04E+01	1.26E+02	N/A	Uncertain
	Northern Harrier	4.94E+01	1.11E+00	2.23E+01	7.27E+01	N/A	Uncertain
	Raccoon	5.01E+01	1.23E+00	1.04E+02	1.56E+02	N/A	Uncertain
	Song Sparrow	1.29E+02	3.08E+00	1.13E+02	2.46E+02	N/A	Uncertain
	Red-Winged Blackbird	8.06E+01	2.51E+00	7.55E+01	1.59E+02	N/A	Uncertain
Lead	American Robin	1.74E-01	9.80E-04	5.86E-02	2.33E-01	1.63E+00	Not an ECOPC
	Belted Kingfisher	2.39E-02	7.81E-04	3.00E-02	5.47E-02	1.63E+00	Not an ECOPC
	Coyote	9.77E+00	5.54E-04	1.95E-02	9.79E+00	4.70E+00	***ECOPC***
	Deer Mouse	1.94E-01	1.04E-03	6.94E-02	2.65E-01	4.70E+00	Not an ECOPC
	Eastern Cottontail	5.51E-02	6.89E-04	3.26E-02	8.84E-02	4.70E+00	Not an ECOPC
	Mallard	1.88E-01	4.05E-04	6.28E-02	2.51E-01	1.63E+00	Not an ECOPC
	Meadow Vole	8.67E-02	9.80E-04	1.17E-01	2.05E-01	4.70E+00	Not an ECOPC
	Mink	1.57E-01	7.10E-04	1.66E-01	3.24E-01	4.70E+00	Not an ECOPC
	Mule Deer	3.62E-02	4.69E-04	6.51E-03	4.31E-02	4.70E+00	Not an ECOPC
	Northern Bobwhite	8.38E-02	7.24E-04	4.12E-02	1.26E-01	1.63E+00	Not an ECOPC
	Northern Harrier	3.21E+01	5.25E-04	1.52E-02	3.21E+01	1.63E+00	***ECOPC***
	Raccoon	1.61E-01	5.82E-04	8.48E-02	2.46E-01	4.70E+00	Not an ECOPC
	Song Sparrow	2.17E-01	1.46E-03	1.04E-01	3.23E-01	1.63E+00	Not an ECOPC
	Red-Winged Blackbird	5.98E-02	1.19E-03	6.94E-02	1.30E-01	1.63E+00	Not an ECOPC

TABLE 2-19
Exposure Screening for Bird and Mammal Receptors

RI Chemicals of Potential Concern (RI COPCs)	Receptor	Exposure (mg/kg-BW/day)				TRV (mg/kg-BW/day)	ECOPC?
		Food	Water	Soil/Sediment	Total		
Manganese	American Robin	8.05E+01	1.55E-01	2.44E+01	1.05E+02	1.79E+02	Not an ECOPC
	Belted Kingfisher	3.84E+00	1.23E-01	6.29E+00	1.03E+01	1.79E+02	Not an ECOPC
	Coyote	1.76E+00	8.74E-02	8.14E+00	9.98E+00	5.15E+01	Not an ECOPC
	Deer Mouse	9.16E+01	1.64E-01	2.89E+01	1.21E+02	5.15E+01	***ECOPC***
	Eastern Cottontail	2.79E+01	1.09E-01	1.36E+01	4.16E+01	5.15E+01	Not an ECOPC
	Mallard	8.27E+01	6.38E-02	1.32E+01	9.59E+01	1.79E+02	Not an ECOPC
	Meadow Vole	9.83E+01	1.55E-01	9.29E+00	1.08E+02	5.15E+01	***ECOPC***
	Mink	8.10E+00	1.12E-01	3.87E+01	4.69E+01	5.15E+01	Not an ECOPC
	Mule Deer	1.83E+01	7.39E-02	2.71E+00	2.11E+01	5.15E+01	Not an ECOPC
	Northern Bobwhite	4.15E+01	1.14E-01	1.72E+01	5.88E+01	1.79E+02	Not an ECOPC
	Northern Harrier	2.55E+00	8.29E-02	6.33E+00	8.96E+00	1.79E+02	Not an ECOPC
	Raccoon	1.62E+01	9.18E-02	1.98E+01	3.61E+01	5.15E+01	Not an ECOPC
	Song Sparrow	1.10E+02	2.56E-01	8.26E+00	1.18E+02	1.79E+02	Not an ECOPC
	Red-Winged Blackbird	4.64E+01	1.87E-01	5.50E+00	5.21E+01	1.79E+02	Not an ECOPC
Mercury	American Robin	7.35E-03	9.94E-06	1.51E-03	8.87E-03	3.90E-02	Not an ECOPC
	Belted Kingfisher	2.58E-02	7.92E-06	4.95E-04	2.63E-02	3.90E-02	Not an ECOPC
	Coyote	1.16E-02	5.62E-06	5.04E-04	1.22E-02	3.20E-02	Not an ECOPC
	Deer Mouse	7.73E-03	1.05E-05	1.79E-03	9.53E-03	3.20E-02	Not an ECOPC
	Eastern Cottontail	1.59E-03	6.98E-06	8.40E-04	2.43E-03	3.20E-02	Not an ECOPC
	Mallard	3.37E-03	4.10E-06	1.04E-03	4.41E-03	3.90E-02	Not an ECOPC
	Meadow Vole	8.17E-03	9.94E-06	2.05E-03	1.02E-02	3.20E-02	Not an ECOPC
	Mink	1.65E-02	7.20E-06	3.27E-03	1.98E-02	3.20E-02	Not an ECOPC
	Mule Deer	1.04E-03	4.75E-06	1.68E-04	1.21E-03	3.20E-02	Not an ECOPC
	Northern Bobwhite	2.72E-03	7.34E-06	1.06E-03	3.79E-03	3.90E-02	Not an ECOPC
	Northern Harrier	3.79E-02	5.33E-06	3.92E-04	3.83E-02	3.90E-02	Not an ECOPC
	Raccoon	1.07E-03	5.90E-06	1.67E-03	2.75E-03	3.20E-02	Not an ECOPC
	Song Sparrow	5.76E-03	1.48E-05	1.82E-03	7.60E-03	3.90E-02	Not an ECOPC
	Red-Winged Blackbird	4.78E-03	1.20E-05	1.22E-03	6.01E-03	3.90E-02	Not an ECOPC
Molybdenum	American Robin	3.02E+00	4.22E-02	7.78E-02	3.14E+00	3.50E+00	Not an ECOPC
	Belted Kingfisher	3.84E-02	3.37E-02	2.97E-02	1.02E-01	3.50E+00	Not an ECOPC
	Coyote	7.97E-02	2.39E-02	2.59E-02	1.29E-01	2.60E-01	Not an ECOPC
	Deer Mouse	3.50E+00	4.47E-02	9.22E-02	3.64E+00	2.60E-01	***ECOPC***
	Eastern Cottontail	1.15E+00	2.97E-02	4.32E-02	1.22E+00	2.60E-01	***ECOPC***
	Mallard	8.68E-02	1.74E-02	6.21E-02	1.66E-01	3.50E+00	Not an ECOPC
	Meadow Vole	3.64E+00	4.22E-02	1.30E-01	3.81E+00	2.60E-01	***ECOPC***
	Mink	5.43E-02	3.06E-02	1.88E-01	2.72E-01	2.60E-01	***ECOPC***
	Mule Deer	7.52E-01	2.02E-02	8.64E-03	7.81E-01	2.60E-01	***ECOPC***
	Northern Bobwhite	1.67E+00	3.12E-02	5.47E-02	1.75E+00	3.50E+00	Not an ECOPC
	Northern Harrier	1.40E-01	2.26E-02	2.02E-02	1.83E-01	3.50E+00	Not an ECOPC
	Raccoon	1.02E-01	2.51E-02	9.58E-02	2.23E-01	2.60E-01	Not an ECOPC
	Song Sparrow	4.51E+00	6.27E-02	1.15E-01	4.69E+00	3.50E+00	***ECOPC***
	Red-Winged Blackbird	1.63E+00	5.11E-02	7.68E-02	1.76E+00	3.50E+00	Not an ECOPC
Nickel	American Robin	2.13E+00	5.48E-02	7.02E-01	2.88E+00	6.71E+00	Not an ECOPC
	Belted Kingfisher	2.37E-01	4.37E-02	3.25E-01	6.05E-01	6.71E+00	Not an ECOPC
	Coyote	4.15E-01	3.10E-02	2.34E-01	6.80E-01	1.70E+00	Not an ECOPC
	Deer Mouse	2.45E+00	5.80E-02	8.32E-01	3.34E+00	1.70E+00	***ECOPC***
	Eastern Cottontail	7.81E-01	3.85E-02	3.90E-01	1.21E+00	1.70E+00	Not an ECOPC
	Mallard	8.74E-01	2.26E-02	6.79E-01	1.57E+00	6.71E+00	Not an ECOPC
	Meadow Vole	1.18E+00	5.48E-02	1.40E+00	2.64E+00	1.70E+00	***ECOPC***
	Mink	2.26E-01	3.97E-02	1.92E+00	2.18E+00	1.70E+00	***ECOPC***
	Mule Deer	5.12E-01	2.62E-02	7.80E-02	6.16E-01	1.70E+00	Not an ECOPC
	Northern Bobwhite	1.14E+00	4.05E-02	4.94E-01	1.68E+00	6.71E+00	Not an ECOPC
	Northern Harrier	1.28E+00	2.94E-02	1.82E-01	1.49E+00	6.71E+00	Not an ECOPC
	Raccoon	2.08E-01	3.26E-02	9.78E-01	1.22E+00	1.70E+00	Not an ECOPC
	Song Sparrow	3.07E+00	1.09E-01	1.25E+00	4.43E+00	6.71E+00	Not an ECOPC
	Red-Winged Blackbird	7.24E-01	6.63E-02	8.32E-01	1.62E+00	6.71E+00	Not an ECOPC

TABLE 2-19
Exposure Screening for Bird and Mammal Receptors

RI Chemicals of Potential Concern (RI COPCs)	Receptor	Exposure (mg/kg-BW/day)				TRV (mg/kg-BW/day)	ECOPC?
		Food	Water	Soil/Sediment	Total		
Selenium	American Robin	3.59E+01	9.14E-01	6.62E-01	3.75E+01	2.90E-01	***ECOPC***
	Belted Kingfisher	2.32E+00	7.28E-01	2.24E+00	5.29E+00	2.90E-01	***ECOPC***
	Coyote	3.67E+00	5.16E-01	2.21E-01	4.40E+00	1.43E-01	***ECOPC***
	Deer Mouse	3.86E+01	9.67E-01	7.84E-01	4.04E+01	1.43E-01	***ECOPC***
	Eastern Cottontail	9.09E+00	6.42E-01	3.68E-01	1.01E+01	1.43E-01	***ECOPC***
	Mallard	4.23E+00	3.77E-01	4.69E+00	9.30E+00	2.90E-01	***ECOPC***
	Meadow Vole	4.65E+01	9.14E-01	5.33E-01	4.79E+01	1.43E-01	***ECOPC***
	Mink	2.07E+00	6.62E-01	5.60E+00	8.33E+00	1.43E-01	***ECOPC***
	Mule Deer	5.96E+00	4.37E-01	7.35E-02	6.47E+00	1.43E-01	***ECOPC***
	Northern Bobwhite	1.48E+01	6.75E-01	4.66E-01	1.59E+01	2.90E-01	***ECOPC***
	Northern Harrier	1.06E+01	4.90E-01	1.72E-01	1.13E+01	2.90E-01	***ECOPC***
	Raccoon	1.94E+00	5.43E-01	2.86E+00	5.34E+00	1.43E-01	***ECOPC***
	Song Sparrow	2.03E+01	1.36E+00	4.74E-01	2.21E+01	2.90E-01	***ECOPC***
	Red-Winged Blackbird	2.54E+01	1.11E+00	3.16E-01	2.68E+01	2.90E-01	***ECOPC***
Silver	American Robin	4.59E-02	5.80E-05	1.30E-02	5.89E-02	2.02E+00	Not an ECOPC
	Belted Kingfisher	5.85E-03	4.62E-05	5.50E-03	1.14E-02	2.02E+00	Not an ECOPC
	Coyote	3.94E-03	3.28E-05	4.32E-03	8.29E-03	6.02E+00	Not an ECOPC
	Deer Mouse	5.19E-02	6.13E-05	1.54E-02	6.73E-02	6.02E+00	Not an ECOPC
	Eastern Cottontail	1.54E-02	4.07E-05	7.20E-03	2.27E-02	6.02E+00	Not an ECOPC
	Mallard	1.18E-02	2.39E-05	1.15E-02	2.33E-02	2.02E+00	Not an ECOPC
	Meadow Vole	4.81E-03	5.80E-05	2.05E-02	2.54E-02	6.02E+00	Not an ECOPC
	Mink	4.55E-03	4.20E-05	3.20E-02	3.65E-02	6.02E+00	Not an ECOPC
	Mule Deer	1.01E-02	2.77E-05	1.44E-03	1.16E-02	6.02E+00	Not an ECOPC
	Northern Bobwhite	2.31E-02	4.28E-05	9.12E-03	3.23E-02	2.02E+00	Not an ECOPC
	Northern Harrier	1.11E-02	3.11E-05	3.36E-03	1.45E-02	2.02E+00	Not an ECOPC
	Raccoon	2.36E-03	3.44E-05	1.63E-02	1.87E-02	6.02E+00	Not an ECOPC
	Song Sparrow	6.07E-02	8.61E-05	1.82E-02	7.90E-02	2.02E+00	Not an ECOPC
	Red-Winged Blackbird	6.41E-03	7.01E-05	1.22E-02	1.86E-02	2.02E+00	Not an ECOPC
Thallium	American Robin	5.41E-02	7.16E-05	3.78E-03	5.79E-02	3.50E-01	Not an ECOPC
	Belted Kingfisher	9.36E-03	5.71E-05	1.87E-03	1.13E-02	3.50E-01	Not an ECOPC
	Coyote	2.56E-03	4.05E-05	1.26E-03	3.86E-03	4.80E-01	Not an ECOPC
	Deer Mouse	6.21E-02	7.58E-05	4.48E-03	6.67E-02	4.80E-01	Not an ECOPC
	Eastern Cottontail	1.97E-02	5.03E-05	2.10E-03	2.19E-02	4.80E-01	Not an ECOPC
	Mallard	1.22E-02	2.96E-05	3.91E-03	1.61E-02	3.50E-01	Not an ECOPC
	Meadow Vole	2.13E-02	7.16E-05	7.56E-03	2.89E-02	4.80E-01	Not an ECOPC
	Mink	6.97E-03	5.19E-05	1.06E-02	1.76E-02	4.80E-01	Not an ECOPC
	Mule Deer	1.29E-02	3.43E-05	4.20E-04	1.34E-02	4.80E-01	Not an ECOPC
	Northern Bobwhite	2.89E-02	5.29E-05	2.66E-03	3.16E-02	3.50E-01	Not an ECOPC
	Northern Harrier	6.23E-03	3.84E-05	9.80E-04	7.25E-03	3.50E-01	Not an ECOPC
	Raccoon	3.49E-03	4.26E-05	5.40E-03	8.94E-03	4.80E-01	Not an ECOPC
	Song Sparrow	7.75E-02	1.06E-04	6.72E-03	8.43E-02	3.50E-01	Not an ECOPC
	Red-Winged Blackbird	1.05E-02	8.67E-05	4.48E-03	1.51E-02	3.50E-01	Not an ECOPC
Uranium	American Robin	8.96E-02	6.62E-03	2.47E-01	3.43E-01	1.60E+01	Not an ECOPC
	Belted Kingfisher	1.12E-01	5.28E-03	4.39E-02	1.61E-01	1.60E+01	Not an ECOPC
	Coyote	3.82E-03	3.74E-03	8.24E-02	8.99E-02	3.07E+00	Not an ECOPC
	Deer Mouse	8.76E-02	7.01E-03	2.93E-01	3.87E-01	3.07E+00	Not an ECOPC
	Eastern Cottontail	9.33E-03	4.66E-03	1.37E-01	1.51E-01	3.07E+00	Not an ECOPC
	Mallard	1.29E-01	2.74E-03	9.18E-02	2.23E-01	1.60E+01	Not an ECOPC
	Meadow Vole	2.85E-02	6.62E-03	1.16E-01	1.51E-01	3.07E+00	Not an ECOPC
	Mink	7.82E-02	4.80E-03	3.59E-01	4.42E-01	3.07E+00	Not an ECOPC
	Mule Deer	6.12E-03	3.17E-03	2.75E-02	3.67E-02	3.07E+00	Not an ECOPC
	Northern Bobwhite	2.20E-02	4.90E-03	1.74E-01	2.01E-01	1.60E+01	Not an ECOPC
	Northern Harrier	9.06E-03	3.55E-03	6.41E-02	7.67E-02	1.60E+01	Not an ECOPC
	Raccoon	2.31E-02	3.94E-03	1.83E-01	2.10E-01	3.07E+00	Not an ECOPC
	Song Sparrow	3.67E-02	9.84E-03	1.03E-01	1.49E-01	1.60E+01	Not an ECOPC
	Red-Winged Blackbird	2.56E-02	8.02E-03	6.85E-02	1.02E-01	1.60E+01	Not an ECOPC

TABLE 2-19
Exposure Screening for Bird and Mammal Receptors

RI Chemicals of Potential Concern (RI COPCs)	Receptor	Exposure (mg/kg-BW/day)				TRV (mg/kg-BW/day)	ECOPC?
		Food	Water	Soil/Sediment	Total		
Vanadium	American Robin	1.08E+00	1.33E-02	1.23E+00	2.33E+00	3.44E-01	***ECOPC***
	Belted Kingfisher	1.81E-01	1.06E-02	4.66E-01	6.58E-01	3.44E-01	***ECOPC***
	Coyote	5.55E-02	7.53E-03	4.10E-01	4.73E-01	4.16E+00	Not an ECOPC
	Deer Mouse	1.04E+00	1.41E-02	1.46E+00	2.51E+00	4.16E+00	Not an ECOPC
	Eastern Cottontail	7.69E-02	9.37E-03	6.84E-01	7.70E-01	4.16E+00	Not an ECOPC
	Mallard	8.84E-01	5.51E-03	9.75E-01	1.86E+00	3.44E-01	***ECOPC***
	Meadow Vole	3.08E-01	1.33E-02	1.36E+00	1.68E+00	4.16E+00	Not an ECOPC
	Mink	1.71E-01	9.66E-03	2.66E+00	2.84E+00	4.16E+00	Not an ECOPC
	Mule Deer	5.04E-02	6.38E-03	1.37E-01	1.94E-01	4.16E+00	Not an ECOPC
	Northern Bobwhite	2.26E-01	9.85E-03	8.66E-01	1.10E+00	3.44E-01	***ECOPC***
	Northern Harrier	1.41E-01	7.15E-03	3.19E-01	4.67E-01	3.44E-01	***ECOPC***
	Raccoon	1.59E-01	7.92E-03	1.36E+00	1.52E+00	4.16E+00	Not an ECOPC
	Song Sparrow	3.02E-01	1.98E-02	1.20E+00	1.53E+00	3.44E-01	***ECOPC***
	Red-Winged Blackbird	4.16E-01	1.61E-02	8.03E-01	1.23E+00	3.44E-01	***ECOPC***
Zinc	American Robin	5.12E+01	1.74E-01	3.35E+00	5.48E+01	6.61E+01	Not an ECOPC
	Belted Kingfisher	1.51E+01	1.39E-01	1.41E+00	1.66E+01	6.61E+01	Not an ECOPC
	Coyote	5.16E+01	9.83E-02	1.12E+00	5.28E+01	7.54E+01	Not an ECOPC
	Deer Mouse	5.55E+01	1.84E-01	3.97E+00	5.97E+01	7.54E+01	Not an ECOPC
	Eastern Cottontail	1.36E+01	1.22E-01	1.86E+00	1.56E+01	7.54E+01	Not an ECOPC
	Mallard	2.35E+01	7.18E-02	2.94E+00	2.65E+01	6.61E+01	Not an ECOPC
	Meadow Vole	6.91E+01	1.74E-01	6.70E+00	7.59E+01	7.54E+01	***ECOPC***
	Mink	1.21E+01	1.26E-01	8.84E+00	2.11E+01	7.54E+01	Not an ECOPC
	Mule Deer	8.92E+00	8.32E-02	3.72E-01	9.38E+00	7.54E+01	Not an ECOPC
	Northern Bobwhite	2.18E+01	1.29E-01	2.36E+00	2.42E+01	6.61E+01	Not an ECOPC
	Northern Harrier	1.67E+02	9.32E-02	8.68E-01	1.68E+02	6.61E+01	***ECOPC***
	Raccoon	7.11E+00	1.03E-01	4.51E+00	1.17E+01	7.54E+01	Not an ECOPC
	Song Sparrow	2.98E+01	3.28E-01	5.95E+00	3.60E+01	6.61E+01	Not an ECOPC
	Red-Winged Blackbird	3.53E+01	2.10E-01	3.97E+00	3.94E+01	6.61E+01	Not an ECOPC

Notes:

RI - Remedial Investigation, mg/kg-BW/day - milligram per kilogram of body weight per day

Ecological Chemical of Potential Concern (ECOPC) - The maximum exposure estimate was greater than the screening Toxicity Reference Value (TRV).

Not an ECOPC - The maximum exposure estimate was less than the screening TRV.

N/A - A TRV was not available for that RI COPC/Receptor pair.

Uncertain - No TRV was avaialble for the RI COPC/Receptor pair. The COI will be carried forward as constituent of uncertain risk.

[1] Aluminum was not identified as a COPC because soil pH at the site is generally greater than 5.5.

TABLE 2-20
Summary of ECOPCs for Aquatic Receptors

Surface Water ECOPCs	Sediment ECOPCs	Fish Tissue ECOPCs	Uncertain
Aluminum	Arsenic	Aluminum	Barium - fish tissue
Arsenic	Barium	Cadmium	Beryllium - Sediment
Cadmium	Beryllium	Chromium	Boron - Sediment
Iron	Boron	Copper	Cobalt - fish tissue
Nickel	Cadmium	Iron	Manganese - fish tissue
Selenium	Chromium	Nickel	Molybdenum - Sediment
Zinc	Copper	Selenium	Thallium - Sediment
	Iron	Vanadium	Vanadium - Sediment
	Manganese	Zinc	
	Molybdenum		
	Nickel		
	Selenium		
	Silver		
	Thallium		
	Vanadium		
	Zinc		

Notes:

ECOPC - Ecological Chemical of Potential Concern

TABLE 2-21
Receptor-Specific Summary of ECOPCs in Terrestrial and Riparian Habitats

ECOPC	Receptor
Antimony	Deer Mouse
	Meadow Vole
	Mink
	Plant/Invert
Arsenic	Deer Mouse
	Meadow Vole
	Plant/Invert
Barium	Plant/Invert
Boron	Plant/Invert
Cadmium	American Robin
	Deer Mouse
	Meadow Vole
	Plant/Invert
Chromium	American Robin
	Plant/Invert
	Song Sparrow
	Red-Winged Blackbird
Cobalt	Plant/Invert
Copper	American Robin
	Coyote
	Deer Mouse
	Mallard
	Meadow Vole
	Northern Harrier
	Plant/Invert
Lead	Coyote
	Northern Harrier
Manganese	Deer Mouse
	Meadow Vole
	Plant/Invert
Mercury	Plant/Invert
Molybdenum	Deer Mouse
	Eastern Cottontail
	Meadow Vole
	Mink
	Mule Deer
	Song Sparrow
	Plant/Invert

ECOPC	Receptor
Nickel	Deer Mouse
	Meadow Vole
	Mink
	Plant/Invert
Selenium	American Robin
	Coyote
	Deer Mouse
	Eastern Cottontail
	Belted Kingfisher
	Mallard
	Meadow Vole
	Mink
	Mule Deer
	Northern Bobwhite
	Northern Harrier
	Song Sparrow
	Plant/Invert
	Raccoon
	Red-Winged Blackbird
Thallium	Plant/Invert
Uranium	Plant/Invert
Vanadium	American Robin
	Belted Kingfisher
	Mallard
	Northern Bobwhite
	Northern Harrier
	Plant/Invert
	Song Sparrow
	Red-Winged Blackbird
Zinc	Meadow Vole
	Northern Harrier
	Plant/Invert

Notes:
ECOPC - Ecological Chemical of Potential Concern

TABLE 2-22
Overall ECOPC Summary for Plant, Terrestrial Invertebrate and Wildlife Receptors

ECOPC for One or More Wildlife Receptor(s)	ECOPC for Plants/Invertebrates	ECOPC for ONLY Plants/Invertebrates (i.e., Not an ECOPC for Any Wildlife Receptor)	Uncertain
Antimony (mammals)	Antimony	Barium	Aluminum
Arsenic	Arsenic	Boron	Antimony (birds)
Cadmium	Barium	Cobalt	Beryllium (birds)
Chromium	Boron	Mercury	Iron
Copper	Cadmium	Thallium	
Lead	Chromium	Uranium	
Manganese	Cobalt		
Molybdenum	Copper		
Nickel	Lead		
Selenium	Manganese		
Vanadium	Mercury		
Zinc	Molybdenum		
	Nickel		
	Selenium		
	Thallium		
	Uranium		
	Vanadium		
	Zinc		

Notes:

ECOPC - Ecological Chemical of Potential Concern

Wildlife receptors include bird and mammal receptors; ECOPCs for birds are also considered ECOPCs for reptiles.

TABLE 2-23
Assessment/Measurement Endpoints for Smoky Canyon Mine RI/FS

Receptor Groups (Trophic Level / Feeding Guild)	Representative Receptors	Ecosystem Type	Assessment Endpoint	Measurement Endpoint
Terrestrial Ecosystems				
1° Producers – Terrestrial plants.	Grasses, forbs, shrubs, and trees	Terrestrial	Survival, growth, and reproduction adequate to sustain populations at the Site	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Comparison to HQs based on background and reference areas[2]
1° Consumers– Terrestrial invertebrates.	Terrestria invertebrate community	Terrestrial	Survival, growth, and reproduction adequate to sustain populations at the Site	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Comparison to HQs based on background and reference areas[2]
1° Consumers – Terrestrial Herbivorous Birds	Chipping sparrow (*Spizella passerina)* [Surrogate = Northern Bobwhite (*Colinus virginianus*)]	Terrestrial	Survival, growth, and reproduction adequate to sustain populations at the Site[1]	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Measurement of COPC concentrations in abiotic media and selected food items; calculation of total intake from receptor-specific ingestion models; comparison of dose to TRVs to calculate HQs; 3. Comparison to HQs based on background and reference areas[2]
1° Consumers – Terrestrial Herbivorous Mammals	Black-tailed jackrabbit (*Lepus californicus)* [Surrogate = Eastern Cottontail (*Sylvilagus floridanus*)]	Terrestrial	Survival, growth, and reproduction adequate to sustain populations at the Site[1]	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Measurement of COPC concentrations in abiotic media and selected food items; calculation of total intake from receptor-specific ingestion models; comparison of dose to TRVs to calculate HQs; 3. Comparison to HQs based on background and reference areas[2]
1° Consumers – Terrestrial Herbivorous Mammals	Mule deer (*Odocoileus hemionus)*	Terrestrial	Survival, growth, and reproduction adequate to sustain populations at the Site[1]	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Measurement of COPC concentrations in abiotic media and selected food items; calculation of total intake from receptor-specific ingestion models; comparison of dose to TRVs to calculate HQs; 3. Comparison to HQs based on background and reference areas[2]
2° Consumers – Terrestrial Omnivorous Birds	American Robin (*Turdus migratorius)*	Terrestrial	Survival, growth, and reproduction adequate to sustain populations at the Site[1]	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Measurement of COPC concentrations in abiotic media and selected food items; calculation of total intake from receptor-specific ingestion models; comparison of dose to TRVs to calculate HQs; 3. Comparison to HQs based on background and reference areas[2]
2° Consumers – Terrestrial Omnivorous Mammals	Deer Mouse (*Peromyscus maniculatus)*	Terrestrial	Survival, growth, and reproduction adequate to sustain populations at the Site[1]	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Measurement of COPC concentrations in abiotic media and selected food items; calculation of total intake from receptor-specific ingestion models; comparison of dose to TRVs to calculate HQs; 3. Comparison to HQs based on background and reference areas[2]
2° Consumers – Terrestrial Reptiles	Western garter snake (*Thamnophis elegans*)	Terrestrial	Survival, growth, and reproduction adequate to sustain populations at the Site[1]	Qualitatively assessed through other communities and guilds (2° Consumers – Terrestrial Omnivorous Birds)
3° Consumers – Terrestrial Carnivorous Mammals	Coyote (*Canis latrans)*	Terrestrial	Survival, growth, and reproduction adequate to sustain populations at the Site[1]	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Measurement of COPC concentrations in abiotic media and selected food items; calculation of total intake from receptor-specific ingestion models; comparison of dose to TRVs to calculate HQs; 3. Comparison to HQs based on background and reference areas[2]
3° Consumers – Terrestrial Raptors	Northern Harrier (*Circus cyaneus*)	Terrestrial	Survival, growth, and reproduction adequate to sustain populations at the Site[1]	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Measurement of COPC concentrations in abiotic media and selected food items; calculation of total intake from receptor-specific ingestion models; comparison of dose to TRVs to calculate HQs; 3. Comparison to HQs based on background and reference areas[2]
Aquatic and Riparian Ecosystems				
1° Producers	Periphyton, aquatic plants	Aquatic	Survival, growth, and reproduction adequate to sustain populations at the Site	1. Comparison of abiotic media concentrations to toxicity-based benchmarks;
1° Herbivorous Consumers	Zooplankton, aquatic invertebrates, amphibian tadpoles	Aquatic	Survival, growth, and reproduction adequate to sustain populations at the Site	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Community composition at impacted sites compared to reference areas;

TABLE 2-23
Assessment/Measurement Endpoints for Smoky Canyon Mine RI/FS

Receptor Groups (Trophic Level / Feeding Guild)	Representative Receptors	Ecosystem Type	Assessment Endpoint	Measurement Endpoint
1° Consumers – Fish	Sculpin (Cottus sp.)	Aquatic	Survival, growth, and reproduction adequate to sustain populations at the Site	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Community composition at impacted sites compared to reference areas; 3. Fish health (% incidence of DELT abnormalities); 4. Fish tissue COPC concentrations compared to toxicity-based benchmarks, if available and applicable
1° and 2° Consumers – Fish	Trout (Salmo trutta, *Oncorhynchus clarki)*	Aquatic	Survival, growth, and reproduction adequate to sustain populations at the Site[1]	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Community composition at impacted sites compared to reference areas; 3. Fish health (% incidence of DELT abnormalities); 4. Fish tissue COPC concentrations compared to toxicity-based benchmarks, if available and applicable
2° Consumers – Non-Fish	Amphibians	Aquatic	Survival, growth, and reproduction adequate to sustain populations at the Site	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Modelled tissue COPC concentrations compared to toxicity-based benchmarks if applicable (amphibian or fish). See Section 6.
1° Consumers – Aquatic and Riparian Herbivorous Birds	Song Sparrow *(Melospiza melodia)*	Aquatic/ Riparian	Survival, growth, and reproduction adequate to sustain populations at the Site[1]	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Measurement of COPC concentrations in abiotic media and selected food items; calculation of total intake from receptor-specific ingestion models; comparison of dose to TRVs to calculate HQs; 3. Comparison to HQs based on background and reference areas[2]
1° Consumers – Aquatic and Riparian Herbivorous Mammals	Long-tailed Vole (*Microtus longicaudus)* [Surrogate = Meadow vole *(Microtus pennsylvanicus*)]	Aquatic/ Riparian	Survival, growth, and reproduction adequate to sustain populations at the Site[1]	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Measurement of COPC concentrations in abiotic media and selected food items; calculation of total intake from receptor-specific ingestion models; comparison of dose to TRVs to calculate HQs; 3. Comparison to HQs based on background and reference areas[2]
2° Consumers – Aquatic and Riparian Omnivorous Birds	Red-winged blackbird (*Agelaius phoeniceus)*	Aquatic/ Riparian	Survival, growth, and reproduction adequate to sustain populations at the Site[1]	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Measurement of COPC concentrations in abiotic media and selected food items; calculation of total intake from receptor-specific ingestion models; comparison of dose to TRVs to calculate HQs; 3. Comparison to HQs based on background and reference areas[2]
2° Consumers – Aquatic and Riparian Piscivorous Birds	Belted kingfisher *(Megaceryle alcyon)*	Aquatic/ Riparian	Survival, growth, and reproduction adequate to sustain populations at the Site[1]	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Measurement of COPC concentrations in abiotic media and selected food items; calculation of total intake from receptor-specific ingestion models; comparison of dose to TRVs to calculate HQs; 3. Comparison to HQs based on background and reference areas[2]
2° Consumers – Aquatic and Riparian Omnivorous Mammals	Raccoon (*Procyon lotor)*	Aquatic/ Riparian	Survival, growth, and reproduction adequate to sustain populations at the Site[1]	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Measurement of COPC concentrations in abiotic media and selected food items; calculation of total intake from receptor-specific ingestion models; comparison of dose to TRVs to calculate HQs; 3. Comparison to HQs based on background and reference areas[2]
2° Consumers – Aquatic and Riparian Carnivorous Mammals	Mink (*Mustela vison)*	Aquatic/ Riparian	Survival, growth, and reproduction adequate to sustain populations at the Site[1]	1. Comparison of abiotic media concentrations to toxicity-based benchmarks; 2. Measurement of COPC concentrations in abiotic media and selected food items; calculation of total intake from receptor-specific ingestion models; comparison of dose to TRVs to calculate HQs; 3. Comparison to HQs based on background and reference areas[2]

Notes:

1° - primary trophic level
2° - secondary trophic level
3° - tertiary trophic level

COPCs - Chemicals of Potential Concern
TRV - Toxicity Reference Value
HQ - Hazard Quotient

DELT - deformities, fin erosion, lesions, and tumors.

[1] - For species with regulatory protection due to their rare or threatened status, such as special-status species or migratory birds, the measurement and assessment endpoints are related to survival, growth, and reproduction of individuals at the Site.

[2] - No site-specific background sampling is currently planned. However, should additional background data become necessary, a separate, focused data collection effort may be proposed. Background data from the AWERA and SIR will, however, be considered qualitatively in the Uncertainty Assessment.

TABLE 3-1
Surface Water Site-Wide EPC for Analytes Identified as ECOPCs from the Screening Level Assessment

ECOPC			Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentration		ECOPC Max[1]	EPC Concentration, Distribution, and Method		
CASNo	Analyte	Units				Min	Max		EPC[2]	Distribution	Estimation Method
7429-90-5	Aluminum, Total	mg/L	82	13	84%	0.020	4.2	4.2	0.9	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (Chebyshev) UCL
7440-38-2	Arsenic, Dissolved	mg/L	82	15	82%	0.00044	0.27	0.27	0.01	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (BCA) UCL
7440-43-9	Cadmium, Dissolved	mg/L	83	68	18%	0.000017	0.033	0.033	0.01	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	97.5% KM (Chebyshev) UCL
7439-89-6	Iron, Total	mg/L	82	14	83%	0.024	3.19	3.19	0.7	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (Chebyshev) UCL
7440-02-0	Nickel, Dissolved	mg/L	82	0	100%	0.0014	0.52	0.52	0.1	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
7782-49-2	Selenium, Total	mg/L	120	40	67%	0.00021	6.62	6.62	1.1	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	97.5% KM (Chebyshev) UCL
7440-66-6	Zinc, Dissolved	mg/L	82	70	15%	0.001	1.63	1.63	0.2	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL

Notes:

COPCs - Chemicals of Potential Concern, ECOPCs - Ecological Chemicals of Potential Concern, EPC - Exposure Point Concentration, mg/ L - milligram per liter, UCL - Upper Confidence Limit

1. Maximum detected concentration used for EPC value due to small sample size; In absence of detected concentrations, max non-detect values are used.

2. When the calculated 95UCL was greater than the maximum concentration, the maximum concentration was selected as the EPC.

TABLE 3-2
Sediment Site-Wide EPC for Analytes Identified as ECOPCs from the Screening Level Assessment

ECOPC			Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
CASNo	Analyte	Units				Min	Max		EPC[2]	Distribution	Estimation Method
7429-90-5	Aluminum	mg/kg	21	0	100%	2440	21700	21700	14220	Nonparametric Distribution Free UCLs	95% Student's-t UCL
7440-36-0	Antimony	mg/kg	21	2	90%	0.015	2.2	2.2	1.6	Nonparametric Distribution Free UCLs	99% KM (Chebyshev) UCL
7440-38-2	Arsenic	mg/kg	21	0	100%	1.5	22.7	22.7	8.1	Nonparametric Distribution Free UCLs	95% H-UCL
7440-38-2	Barium	mg/kg	21	0	100%	52.2	212.0	212.0	134.2	Assuming Normal Distribution	95% Student's-t UCL
7440-41-7	Beryllium	mg/kg	21	0	100%	0.29	1.6	1.6	0.8	Assuming Normal Distribution	95% Student's-t UCL
7440-42-8	Boron	mg/kg	21	0	100%	8	38.7	38.7	18.5	Nonparametric Distribution Free UCLs	95% Student's-t UCL
7440-43-9	Cadmium	mg/kg	21	0	100%	1.3	42.9	42.9	20.1	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
7440-47-3	Chromium	mg/kg	21	0	100%	17.9	387	387	164.2	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
7440-48-4	Cobalt	mg/kg	21	0	100%	0.84	11.7	11.7	7.1	Assuming Normal Distribution	95% Student's-t UCL
7440-50-8	Copper	mg/kg	21	0	100%	4.5	65.4	65.4	26.3	Assuming Gamma Distribution	95% Adjusted Gamma UCL
7439-89-6	Iron	mg/kg	21	0	100%	1570	25000	25000	16755	Assuming Normal Distribution	95% Student's-t UCL
7439-92-1	Lead	mg/kg	21	13	38%	5.2	27.3	27.3	11.2	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
7439-96-5	Manganese	mg/kg	21	0	100%	222	5720	5720	1619	Assuming Gamma Distribution	95% Adjusted Gamma UCL
7439-97-6	Mercury	mg/kg	21	15	29%	0.057	0.26	0.26	0.1	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
7439-98-7	Molybdenum	mg/kg	21	16	24%	2.3	16	16	3.8	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
7440-02-0	Nickel	mg/kg	21	0	100%	3.9	277	277	120.1	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
7782-49-2	Selenium	mg/kg	38	0	100%	0.39	96.7	96.7	20.6	Assuming Gamma Distribution	95% Adjusted Gamma UCL
7440-22-4	Silver	mg/kg	21	1	95%	0.078	3.6	3.6	1.9	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	97.5% KM (Chebyshev) UCL
7440-28-0	Thallium	mg/kg	21	0	100%	0.12	1.1	1.1	0.5	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
7440-61-1	Uranium	mg/kg	21	0	100%	1.2	35.3	35.3	20.7	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
7440-62-2	Vanadium	mg/kg	21	0	100%	14.4	206	206	99.5	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
7440-66-6	Zinc	mg/kg	21	0	100%	40.5	1280	1280	566.9	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL

Notes:

COPCs - Chemicals of Potential Concern, COI - Chemical of Interest, ECOPCs - Ecological Chemicals of Potential Concern, EPC - Exposure Point Concentration, mg/ L - milligram per liter, UCL - Upper Confidence Limit, mg/kg dw - milligram per kilogram dry weight

1. Maximum detected concentration used for EPC value due to small sample size; In absence of detected concentrations, max non-detect values are used.

2. The calculated 95 UCL is greater than the maximum concentration, therefore the maximum concentration is selected as the EPC.

TABLE 3-3
Site-Wide EPC for Trout for all ECOPCs

ECOPC			Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentration		ECOPC Conc.	EPC Concentration, Distribution, and Method		
CASNo	Analyte	Units				Min	Max	Max[1]	EPC[2]	Distribution	Estimation Method
7429-90-5	Aluminum	mg/kg dw	141	0	100%	4	477	477	109	Lognormal	95% Chebyshev (Mean, Sd) UCL
7440-36-0	Antimony	mg/kg dw	141	94	33%	0.02	0.96	0.96	0.04	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
7440-38-2	Arsenic	mg/kg dw	141	7	95%	0.18	1.41	1.41	0.69	Normal	95% KM (t) UCL
7440-39-3	Barium	mg/kg dw	140	0	100%	0.81	5.81	5.81	2.3	Lognormal	95% Student's-t UCL
7440-41-7	Beryllium	mg/kg dw	141	58	59%	0.004	0.033	0.033	0.06	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
7440-42-8	Boron	mg/kg dw	141	102	28%	0.2	1.1	1.1	0.3	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
7440-43-9	Cadmium	mg/kg dw	141	0	100%	0.033	2.0	2.0	0.3	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
7440-47-3	Chromium	mg/kg dw	141	3	98%	0.08	14.86	14.86	1.1	Lognormal	95% KM (BCA) UCL
7440-48-4	Cobalt	mg/kg dw	141	0	100%	0.039	0.50	0.50	0.18	Gamma	95% Approximate Gamma UCL
7440-50-8	Copper	mg/kg dw	141	0	100%	2.22	39.7	39.7	5.57	Nonparametric Distribution Free UCL Statistics	95% Student's-t UCL
7439-89-6	Iron	mg/kg dw	141	0	100%	41	356	356	114	Lognormal	95% Student's-t UCL
7439-92-1	Lead	mg/kg dw	141	1	99%	0.015	0.37	0.368	0.08	Lognormal	95% KM (BCA) UCL
7439-96-5	Manganese	mg/kg dw	141	0	100%	3.14	50.4	50.4	15.3	Gamma	95% Approximate Gamma UCL
7439-97-6	Mercury	mg/kg dw	134	3	98%	0.007	0.14	0.14	0.05	Gamma	95% KM (BCA) UCL
7439-98-7	Molybdenum	mg/kg dw	141	10	93%	0.05	0.59	0.59	0.1	Nonparametric Distribution Free UCL Statistics	95% KM (BCA) UCL
7440-02-0	Nickel	mg/kg dw	141	4	97%	0.2	3.64	3.64	0.6	Nonparametric Distribution Free UCL Statistics	95% KM (BCA) UCL
7782-49-2	Selenium	mg/kg dw	141	0	100%	2.33	28.3	28.3	14	Nonparametric Distribution Free UCL Statistics	95% Chebyshev (Mean, Sd) UCL
7440-22-4	Silver	mg/kg dw	141	83	41%	0.02	0.09	0.09	0.02	Nonparametric Distribution Free UCL Statistics	95% KM (t) UCL
7440-28-0	Thallium	mg/kg dw	141	14	90%	0.01	0.14	0.14	0.04	Lognormal	95% KM (BCA) UCL
7440-61-1	Uranium	mg/kg dw	141	42	70%	0.002	1.73	1.73	0.1	Lognormal	95% KM (Chebyshev) UCL
7440-62-2	Vanadium	mg/kg dw	141	0	100%	0.09	2.79	2.79	0.4	Lognormal	95% H-UCL
7440-66-6	Zinc	mg/kg dw	141	0	100%	61.2	232	232	129	Nonparametric Distribution Free UCL Statistics	95% Student's-t UCL

Notes:

COPCs - Chemicals of Potential Concern, ECOPCs - Ecological Chemicals of Potential Concern, EPC - Exposure Point Concentration, mg/ L - milligram per liter, UCL - Upper Confidence Limit, mg/kg dw - milligram per kilogram dry weight

1. Maximum detected concentration used for EPC value due to small sample size; In absence of detected concentrations, max non-detect values are used.

2. When the calculated 95 UCL was greater than the maximum concentration, the maximum concentration was selected as the EPC.

TABLE 3-4
Site-Wide EPC for Sculpin for all ECOPCs

ECOPC			Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
CASNo	Analyte	Units				Min	Max		EPC[2]	Distribution	Estimation Method
7429-90-5	Aluminum	mg/kg dw	75	0	100%	12.9	716	716	157	Gamma	95% Approximate Gamma UCL
7440-36-0	Antimony	mg/kg dw	75	71	5%	0.061	0.30	0.30	0.026	Normal	95% KM (t) UCL
7440-38-2	Arsenic	mg/kg dw	75	0	100%	0.26	1.39	1.39	0.82	Normal	95% Student's-t UCL
7440-39-3	Barium	mg/kg dw	75	0	100%	3.08	15	15	6.6	Nonparametric Distribution Free UCL Statistics	95% Student's-t UCL
7440-41-7	Beryllium	mg/kg dw	75	41	45%	0.004	0.036	0.036	0.006	Lognormal	95% KM (t) UCL
7440-42-8	Boron	mg/kg dw	75	75	0%	0.2	0.9	0.9	0.9	No detected values	NA
7440-43-9	Cadmium	mg/kg dw	75	0	100%	0.041	1.01	1.01	0.19	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
7440-47-3	Chromium	mg/kg dw	75	1	99%	0.13	2.55	2.55	0.76	Gamma	95% Approximate Gamma KM-UCL
7440-48-4	Cobalt	mg/kg dw	75	0	100%	0.08	0.45	0.45	0.2	Gamma	95% Approximate Gamma KM-UCL
7440-50-8	Copper	mg/kg dw	75	0	100%	1.88	4.53	4.53	2.86	Nonparametric Distribution Free UCL Statistics	95% Student's-t UCL
7439-89-6	Iron	mg/kg dw	75	0	100%	48	488	488	150	Nonparametric Distribution Free UCL Statistics	95% H-UCL
7439-92-1	Lead	mg/kg dw	75	0	100%	0.035	0.33	0.33	0.13	Nonparametric Distribution Free UCL Statistics	95% Chebyshev (Mean, Sd) UCL
7439-96-5	Manganese	mg/kg dw	75	0	100%	4.15	59	59	22	Lognormal	95% Student's-t UCL
7439-97-6	Mercury	mg/kg dw	75	1	99%	0.006	0.40	0.40	0.07	Lognormal	95% KM (BCA) UCL
7439-98-7	Molybdenum	mg/kg dw	75	5	93%	0.05	0.23	0.23	0.1	Gamma	95% Approximate Gamma KM-UCL
7440-02-0	Nickel	mg/kg dw	75	0	100%	0.38	0.98	0.98	0.6	Gamma	95% Approximate Gamma UCL
7782-49-2	Selenium	mg/kg dw	75	0	100%	3.2	35.7	35.7	15	Normal	95% Student's-t UCL
7440-22-4	Silver	mg/kg dw	75	71	5%	0.021	0.032	0.032	0.006	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
7440-28-0	Thallium	mg/kg dw	75	19	75%	0.005	0.12	0.12	0.0351	Gamma	95% KM (Percentile Bootstrap) UCL
7440-61-1	Uranium	mg/kg dw	75	21	72%	0.005	0.106	0.106	0.0252	Gamma	95% KM (Percentile Bootstrap) UCL
7440-62-2	Vanadium	mg/kg dw	75	0	100%	0.36	2.29	2.29	1.299	Normal	95% Student's-t UCL
7440-66-6	Zinc	mg/kg dw	75	0	100%	42.2	113	113	68.48	Nonparametric Distribution Free UCL Statistics	95% Student's-t UCL

Notes:
COPCs - Chemicals of Potential Concern, COI - Chemical of Interest, EPC - Exposure Point Concentration, mg/kg dw - milligram per kiligram dry weight, UCL - Upper Confidence Limit, NA - Not Applicable
1. Maximum detected concentration used for EPC value due to small sample size; In absence of detected concentrations, max non-detect values are used.
2. When the calculated 95 UCL was greater than the maximum concentration, the maximum concentration was selected as the EPC.

TABLE 3-5
Surface Water EPC for ECOPCs by Drainage

Drainage/Analyte	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC[2]	Distribution	Estimation Method
Aluminum										
Smoky Creek	mg/L	6	0	100%	0.067	0.98	0.98	0.643	Assuming Normal Distribution	95% Student's-t UCL
Roberts Creek	mg/L	2	0	100%	0.088	0.10	0.10	0.103	Only 2 detected concentrations	NA
Tygee Creek	mg/L	5	0	100%	0.11	2.05	2.05	1.575	Assuming Normal Distribution	95% Student's-t UCL
Pole Canyon Creek	mg/L	12	8	33%	0.021	0.62	0.62	0.171	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
North Fork Sage Creek	mg/L	15	0	100%	0.097	3.61	3.61	2.07	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Sage Creek	mg/L	7	1	86%	0.020	2.07	2.07	1.041	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
Hoopes Spring	mg/L	12	7	42%	0.02	0.033	0.033	0.024	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
South Fork Sage Creek	mg/L	20	10	50%	0.024	7.4	7.4	1.776	Assuming Normal Distribution	95% KM (t) UCL
Lower Sage Valley	mg/L	20	3	85%	0.033	1.19	1.19	0.515	Assuming Gamma Distribution	95% Adjusted Gamma KM-UCL
Crow Creek	mg/L	12	0	100%	0.099	0.95	0.95	0.582	Assuming Normal Distribution	95% Student's-t UCL
Arsenic, Dissolved										
Smoky Creek	mg/L	6	3	50%	0.00049	0.00093	0.00093 [1]	0.00093 [1]	Only 3 detected concentrations	NA
Roberts Creek	mg/L	2	0	100%	0.00058	0.00067	0.00067	0.00067	Only 2 detected concentrations	NA
Tygee Creek	mg/L	5	0	100%	0.00071	0.0014	0.0014	0.0014	Assuming Normal Distribution	95% Student's-t UCL
Pole Canyon Creek	mg/L	12	3	75%	0.0005	0.27	0.27	0.25	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	99% KM (Chebyshev) UCL
North Fork Sage Creek	mg/L	12	1	92%	0.0005	0.0017	0.0017	0.0012	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
Sage Creek	mg/L	7	5	29%	0.00046	0.00061	0.00061	0.0006	Only 2 detected concentrations	NA
Hoopes Spring	mg/L	12	0	100%	0.0007	0.0033	0.0033	0.0028	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/L	20	7	65%	0.00045	0.0022	0.0022	0.0009	Lognormal	95% KM (BCA) UCL
Lower Sage Valley	mg/L	20	2	90%	0.00044	0.0023	0.0023	0.0014	Assuming Normal Distribution	95% KM (t) UCL
Crow Creek	mg/L	12	1	92%	0.00071	0.0019	0.0019	0.0014	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (Chebyshev) UCL
Cadmium, Dissolved										
Smoky Creek	mg/L	6	6	0%	NA	NA	0.000039	0.000039	No detected concentrations	NA
Roberts Creek	mg/L	2	2	0%	NA	NA	0.000053	0.000053	No detected concentrations	NA
Tygee Creek	mg/L	5	4	20%	0.000111	0.000111	0.00011	0.00011	Only 1 Detected concentration	NA
Pole Canyon Creek	mg/L	12	3	75%	0.00011	0.0332	0.0332	0.022	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
North Fork Sage Creek	mg/L	12	11	8%	0.00002	0.00002	0.00002 [1]	0.00002 [1]	Only 1 detected concentration	NA
Sage Creek	mg/L	7	7	0%	NA	NA	0.000036	0.000036	No detected concentrations	NA
Hoopes Spring	mg/L	17	17	0%	NA	NA	0.00012	0.00012	No detected concentrations	NA
South Fork Sage Creek	mg/L	20	18	10%	0.000042	0.000078	0.000078	0.000078	Only 2 detected concentrations	95% KM (t) UCL
Lower Sage Valley	mg/L	20	18	10%	0.000042	0.000050	0.00005	0.00005	Only 2 detected concentrations	NA
Crow Creek	mg/L	12	10	17%	0.000017	0.000036	0.000036	0.000036	Only 2 detected concentrations	NA
Iron, Total										
Smoky Creek	mg/L	6	0	100%	0.081	0.89	0.89	0.57	Assuming Normal Distribution	95% Student's-t UCL
Roberts Creek	mg/L	2	2	0%	0.09	0.099	0.099 [1]	0.099 [1]	No detected concentrations	NA
Tygee Creek	mg/L	5	0	100%	0.092	1.22	1.22	0.99	Assuming Normal Distribution	95% Student's-t UCL
Pole Canyon Creek	mg/L	12	9	25%	0.028	0.46	0.46 [1]	0.46 [1]	Only 3 detected concentrations	NA
North Fork Sage Creek	mg/L	12	4	67%	0.12	2.75	2.75	1.47	Assuming Normal Distribution	95% Student's-t UCL
Sage Creek	mg/L	7	2	71%	0.065	1.55	1.55	0.8	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
Hoopes Spring	mg/L	12	8	33%	0.028	0.052	0.052	0.03	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
South Fork Sage Creek	mg/L	20	12	40%	0.033	5.75	5.75	1.35	Assuming Normal Distribution	95% KM (t) UCL
Lower Sage Valley	mg/L	20	2	90%	0.024	1.04	1.04	0.45	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Crow Creek	mg/L	12	0	100%	0.083	0.72	0.72	0.44	Assuming Normal Distribution	95% Student's-t UCL

TABLE 3-5
Surface Water EPC for ECOPCs by Drainage

Drainage/Analyte	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC[2]	Distribution	Estimation Method
Nickel, Dissolved										
Smoky Creek	mg/L	6	0	100%	0.0023	0.0035	0.0035	0.0031	Assuming Normal Distribution	95% Student's-t UCL
Roberts Creek	mg/L	2	0	100%	0.0028	0.0028	0.0028	0.0028	Only 2 detected concentrations	NA
Tygee Creek	mg/L	5	0	100%	0.0032	0.0040	0.0040	0.0038	Assuming Normal Distribution	95% Student's-t UCL
Pole Canyon Creek	mg/L	12	0	100%	0.0019	0.52	0.52	0.35	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/L	7	0	100%	0.0019	0.0058	0.0058	0.0045	Assuming Normal Distribution	95% Student's-t UCL
Sage Creek	mg/L	9	0	100%	0.0021	0.0026	0.0026	0.0025	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Spring	mg/L	12	0	100%	0.0026	0.0029	0.0029	0.0028	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/L	20	0	100%	0.0011	0.0033	0.0033	0.0024	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Valley	mg/L	20	2	90%	0.0024	0.0038	0.0038	0.003	Assuming Lognormal Distribution	95% Student's-t UCL
Crow Creek	mg/L	12	0	100%	0.0026	0.0033	0.0033	0.003	Assuming Normal Distribution	95% Student's-t UCL
Selenium, Total										
Smoky Creek	mg/L	6	4	33%	0.00037	0.0004	0.0004 [1]	0.0004 [1]	Only 2 detected concentrations	NA
Roberts Creek	mg/L	2	1	50%	0.00023	0.00023	0.00023	0.00023	Only 1 detected concentrations	NA
Tygee Creek	mg/L	5	3	40%	0.00055	0.00068	0.00068 [1]	0.00068 [1]	Only 2 detected concentrations	NA
Pole Canyon Creek	mg/L	18	6	67%	0.00023	6.62	6.62	3.403	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
North Fork Sage Creek	mg/L	15	4	73%	0.00024	0.012	0.012	0.0077	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	97.5% KM (Chebyshev) UCL
Sage Creek	mg/L	22	19	14%	0.00021	0.00091	0.00091 [1]	0.00091 [1]	Only 3 detected concentrations	NA
Hoopes Spring	mg/L	13	0	100%	0.012	0.054	0.054	0.043	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/L	34	4	88%	0.00052	0.046	0.046	0.011	Assuming Gamma Distribution	95% Adjusted Gamma KM-UCL
Lower Sage Valley	mg/L	27	3	89%	0.00044	0.037	0.037	0.018	Assuming Normal Distribution	95% KM (t) UCL
Crow Creek	mg/L	17	1	94%	0.00083	0.014	0.014	0.0084	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
Zinc, Dissolved										
Smoky Creek	mg/L	6	6	0%	NA	NA	0.0034	0.0034	No detected concentrations	NA
Roberts Creek	mg/L	2	2	0%	NA	NA	0.0026	0.0026	No detected concentrations	NA
Tygee Creek	mg/L	5	5	0%	NA	NA	0.0043	0.0043	No detected concentrations	NA
Pole Canyon Creek	mg/L	12	4	67%	0.734	1.63	1.63	1.026	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
North Fork Sage Creek	mg/L	12	11	8%	0.0013	0.0013	0.0013 [1]	0.0013 [1]	Only 1 detected concentration	NA
Sage Creek	mg/L	7	7	0%	NA	NA	0.0024	0.0024	No detected concentrations	NA
Hoopes Spring	mg/L	12	12	0%	NA	NA	0.0038	0.0038	No detected concentrations	NA
South Fork Sage Creek	mg/L	20	20	0%	NA	NA	0.0054	0.0054	No detected concentrations	NA
Lower Sage Valley	mg/L	20	18	10%	0.001	0.0054	0.0054	0.0054	Only 2 detect concentrations	NA
Crow Creek	mg/L	12	11	8%	0.015	0.015	0.015	0.015	Oly 1 detected concentration	NA

Notes:

COI - Chemical of Interest, ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, ERA - Ecological Risk Assessment, NA - Not Available, mg/ L - milligram per liter, UCL - Upper Confidence Limit

1. Maximum detected concentration used for EPC value due to small sample size; In absence of detected concentrations, max non-detect values are used.
2. When the calculated 95 UCL was greater than the maximum concentration, the maximum concentration was selected as the EPC.

TABLE 3-6
Sediment EPC for ECOPCs by Drainage

Drainage/Analyte	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentration		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC[2]	Distribution	Estimation Method
Arsenic										
Smoky Creek	mg/kg dw	2	0	100%	2.6	4.3	4.3	4.3	Only 2 detected concentrations	NA
Roberts Creek	mg/kg dw	1	0	100%	2.4	2.4	2.4	2.4	Only 1 detected concentration	NA
Tygee Creek	mg/kg dw	1	0	100%	3.4	3.4	3.4	3.4	Only 1 detected concentration	NA
Pole Canyon Creek	mg/kg dw	4	0	100%	8.6	22.7	22.7	22.7	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/kg dw	1	0	100%	4.6	4.6	4.6	4.6	Only 1 detected concentration	NA
Sage Creek	mg/kg dw	4	0	100%	4.3	8.5	8.5	7.9	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Spring	mg/kg dw	1	0	100%	2.4	2.4	2.4	2.4	Only 1 detected concentration	NA
South Fork Sage Creek	mg/kg dw	1	0	100%	4.3	4.3	4.3	4.3	Only 1 detected concentration	NA
Lower Sage Valley	mg/kg dw	4	0	100%	2.3	3.3	3.3	3.3	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg dw	2	0	100%	1.5	1.8	1.8	1.8	Only 2 detected concentrations	NA
Barium										
Smoky Creek	mg/kg dw	2	0	100%	86	136	136	136	Only 2 detected concentrations	NA
Roberts Creek	mg/kg dw	1	0	100%	59.9	59.9	59.9	59.9	Only 1 detected concentration	NA
Tygee Creek	mg/kg dw	1	0	100%	171	171	171	171	Only 1 detected concentration	NA
Pole Canyon Creek	mg/kg dw	4	0	100%	90.3	176	176	181	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/kg dw	1	0	100%	198	198	198	198	Only 1 detected concentration	NA
Sage Creek	mg/kg dw	4	0	100%	119	212	212	200	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Spring	mg/kg dw	1	0	100%	52.2	52.2	52.2	52.2	Only 1 detected concentration	NA
South Fork Sage Creek	mg/kg dw	1	0	100%	87.4	87.4	87.4	87.4	Only 1 detected concentration	NA
Lower Sage Valley	mg/kg dw	4	0	100%	82.4	112	112	112	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg dw	2	0	100%	61	83.7	83.7	83.7	Only 2 detected concentrations	NA
Beryllium										
Smoky Creek	mg/kg dw	2	0	100%	0.68	0.81	0.81	0.81	Only 1 detected concentration	NA
Roberts Creek	mg/kg dw	1	0	100%	0.42	0.42	0.42	0.42	Only 1 detected concentration	NA
Tygee Creek	mg/kg dw	1	0	100%	0.52	0.52	0.52	0.52	Only 1 detected concentration	NA
Pole Canyon Creek	mg/kg dw	4	0	100%	0.89	1.1	1.1	1.1	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/kg dw	1	0	100%	0.83	0.83	0.83	0.83	Only 1 detected concentration	NA
Sage Creek	mg/kg dw	4	0	100%	0.67	1.6	1.6	1.46	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Spring	mg/kg dw	1	0	100%	0.38	0.38	0.38	0.38	Only 1 detected concentration	NA
South Fork Sage Creek	mg/kg dw	1	0	100%	0.65	0.65	0.65	0.65	Only 1 detected concentration	NA
Lower Sage Valley	mg/kg dw	4	0	100%	0.46	0.67	0.67	0.67	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg dw	2	0	100%	0.29	0.35	0.35	0.35	Only 2 detected concentrations	NA

TABLE 3-6
Sediment EPC for ECOPCs by Drainage

Drainage/Analyte	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentration		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC[2]	Distribution	Estimation Method
Boron										
Smoky Creek	mg/kg dw	2	0	100%	11.2	12.9	12.9	12.9	Only 1 detected concentration	NA
Roberts Creek	mg/kg dw	1	0	100%	12.3	12.3	12.3	12.3	Only 1 detected concentration	NA
Tygee Creek	mg/kg dw	1	0	100%	11.3	11.3	11.3	11.3	Only 1 detected concentration	NA
Pole Canyon Creek	mg/kg dw	4	0	100%	23.4	38.7	38.7	38.3	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/kg dw	1	0	100%	10.8	10.8	10.8	10.8	Only 1 detected concentration	NA
Sage Creek	mg/kg dw	4	0	100%	10.8	18.7	18.7	17.91	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Spring	mg/kg dw	1	0	100%	8	8	8	8	Only 1 detected concentration	NA
South Fork Sage Creek	mg/kg dw	1	0	100%	13.2	13.2	13.2	13.2	Only 1 detected concentration	NA
Lower Sage Valley	mg/kg dw	4	0	100%	11.7	14	14	14	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg dw	2	0	100%	9.4	9.8	9.8	9.8	Only 2 detected concentrations	NA
Cadmium										
Smoky Creek	mg/kg dw	2	0	100%	1.3	3.7	3.7	3.7	Only 2 detected concentrations	NA
Roberts Creek	mg/kg dw	1	0	100%	4.8	4.8	4.8	4.8	Only 1 detected concentration	NA
Tygee Creek	mg/kg dw	1	0	100%	2.3	2.3	2.3	2.3	Only 1 detected concentration	NA
Pole Canyon Creek	mg/kg dw	4	0	100%	17.9	42.9	42.9	42.9	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/kg dw	1	0	100%	3.1	3.1	3.1	3.1	Only 1 detected concentration	NA
Sage Creek	mg/kg dw	4	0	100%	1.3	14.3	14.3	12.3	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Spring	mg/kg dw	1	0	100%	5.8	5.8	5.8	5.8	Only 1 detected concentration	NA
South Fork Sage Creek	mg/kg dw	1	0	100%	3.8	3.8	3.8	3.8	Only 1 detected concentration	NA
Lower Sage Valley	mg/kg dw	4	0	100%	1.7	3.4	3.4	3.4	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg dw	2	0	100%	1.5	1.6	1.6	1.6	Only 2 detected concentrations	NA
Chromium										
Smoky Creek	mg/kg dw	2	0	100%	26.2	35.2	35.2	35.2	Only 2 detected concentrations	NA
Roberts Creek	mg/kg dw	1	0	100%	50.9	50.9	50.9	50.9	Only 1 detected concentration	NA
Tygee Creek	mg/kg dw	1	0	100%	21.2	21.2	21.2	21.2	Only 1 detected concentration	NA
Pole Canyon Creek	mg/kg dw	4	0	100%	83.6	387	387	387	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/kg dw	1	0	100%	30.6	30.6	30.6	30.6	Only 1 detected concentration	NA
Sage Creek	mg/kg dw	4	0	100%	21	77.2	77.2	70.06	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Spring	mg/kg dw	1	0	100%	50.3	50.3	50.3	50.3	Only 1 detected concentration	NA
South Fork Sage Creek	mg/kg dw	1	0	100%	37.4	37.4	37.4	37.4	Only 1 detected concentration	NA
Lower Sage Valley	mg/kg dw	4	0	100%	22.7	29.1	29.1	29.1	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg dw	2	0	100%	17.9	22.1	22.1	22.1	Only 2 detected concentrations	NA

TABLE 3-6
Sediment EPC for ECOPCs by Drainage

Drainage/Analyte	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentration		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC[2]	Distribution	Estimation Method
Copper										
Smoky Creek	mg/kg dw	2	0	100%	15.8	20.5	20.5	20.5	Only 2 detected concentrations	NA
Roberts Creek	mg/kg dw	1	0	100%	6.6	6.6	6.6	6.6	Only 1 detected concentration	NA
Tygee Creek	mg/kg dw	1	0	100%	10.2	10.2	10.2	10.2	Only 1 detected concentration	NA
Pole Canyon Creek	mg/kg dw	4	0	100%	30.6	65.4	65.4	65.4	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/kg dw	1	0	100%	17.2	17.2	17.2	17.2	Only 1 detected concentration	NA
Sage Creek	mg/kg dw	4	0	100%	14	33.7	33.7	30.59	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Spring	mg/kg dw	1	0	100%	4.5	4.5	4.5	4.5	Only 1 detected concentration	NA
South Fork Sage Creek	mg/kg dw	1	0	100%	10.4	10.4	10.4	10.4	Only 1 detected concentration	NA
Lower Sage Valley	mg/kg dw	4	0	100%	7.1	12.1	12.1	12.1	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg dw	2	0	100%	4.6	5.9	5.9	5.9	Only 2 detected concentrations	NA
Iron										
Smoky Creek	mg/kg dw	2	0	100%	16400	22200	22200	22200	Only 2 detected concentrations	NA
Roberts Creek	mg/kg dw	1	0	100%	6220	6220	6220	6220	Only 1 detected concentration	NA
Tygee Creek	mg/kg dw	1	0	100%	11000	11000	11000	11000	Only 1 detected concentration	NA
Pole Canyon Creek	mg/kg dw	4	0	100%	12500	20600	20600	20600	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/kg dw	1	0	100%	23200	23200	23200	23200	Only 1 detected concentration	NA
Sage Creek	mg/kg dw	4	0	100%	18500	25000	25000	24333	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Spring	mg/kg dw	1	0	100%	1570	1570	1570	1570	Only 1 detected concentration	NA
South Fork Sage Creek	mg/kg dw	1	0	100%	11400	11400	11400	11400	Only 1 detected concentration	NA
Lower Sage Valley	mg/kg dw	4	0	100%	8830	15000	15000	15562	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg dw	2	0	100%	5060	6820	6820	6820	Only 2 detected concentrations	NA
Manganese										
Smoky Creek	mg/kg dw	2	0	100%	642	1490	1490	1490	Only 2 detected concentrations	NA
Roberts Creek	mg/kg dw	1	0	100%	643	643	643	643	Only 1 detected concentration	NA
Tygee Creek	mg/kg dw	1	0	100%	976	976	976	976	Only 1 detected concentration	NA
Pole Canyon Creek	mg/kg dw	4	0	100%	542	1400	1400	1400	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/kg dw	1	0	100%	5720	5720	5720	5720	Only 1 detected concentration	NA
Sage Creek	mg/kg dw	4	0	100%	1180	1500	1500	1480	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Spring	mg/kg dw	1	0	100%	222	222	222	222	Only 1 detected concentration	NA
South Fork Sage Creek	mg/kg dw	1	0	100%	738	738	738	738	Only 1 detected concentration	NA
Lower Sage Valley	mg/kg dw	4	0	100%	696	2000	2000	1856	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg dw	2	0	100%	243	277	277	277	Only 2 detected concentrations	NA

TABLE 3-6
Sediment EPC for ECOPCs by Drainage

Drainage/Analyte	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentration		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC[2]	Distribution	Estimation Method
Mercury										
Smoky Creek	mg/kg dw	2	2	0%	0.038	0.04	0.04	0.04	All concentrations non detect	NA
Roberts Creek	mg/kg dw	1	1	0%	0.03	0.03	0.03	0.03	All concentrations non detect	NA
Tygee Creek	mg/kg dw	1	0	0%	0.023	0.023	0.023	0.023	All concentrations non detect	NA
Pole Canyon Creek	mg/kg dw	4	4	100%	0.083	0.26	0.26	0.26	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/kg dw	1	1	100%	0.067	0.067	0.067	0.067	Only 1 detected concentration	NA
Sage Creek	mg/kg dw	4	3	25%	0.023	0.057	0.057	0.057	Only 1 detected concentration	NA
Hoopes Spring	mg/kg dw	1	1	100%	0.023	0.023	0.023	0.023	All concentrations non detect	NA
South Fork Sage Creek	mg/kg dw	1	1	0%	0.025	0.025	0.025	0.025	All concentrations non detect	NA
Lower Sage Valley	mg/kg dw	4	4	0%	0.0095	0.03	0.03	0.03	All concentrations non detect	NA
Crow Creek	mg/kg dw	2	2	0%	0.02	0.02	0.02	0.02	All concentrations non detect	NA
Molybdenum										
Smoky Creek	mg/kg dw	2	2	0%	NA	NA	NA	0.39	No detected concentrations	NA
Roberts Creek	mg/kg dw	1	1	0%	NA	NA	NA	0.79	No detected concentrations	NA
Tygee Creek	mg/kg dw	1	1	0%	NA	NA	NA	0.44	No detected concentrations	NA
Pole Canyon Creek	mg/kg dw	4	0	100%	3.2	16	16	16	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/kg dw	1	1	0%	na	na	na	0.43	No detected concentrations	NA
Sage Creek	mg/kg dw	4	3	25%	2.3	2.3	2.3	2.3	Only 1 detected concentration	NA
Hoopes Spring	mg/kg dw	1	1	0%	NA	NA	NA	0.55	No detected concentrations	NA
South Fork Sage Creek	mg/kg dw	1	1	0%	NA	NA	NA	0.77	No detected concentrations	NA
Lower Sage Valley	mg/kg dw	4	4	0%	NA	NA	NA	0.52	No detected concentrations	NA
Crow Creek	mg/kg dw	2	2	0%	0.37	0.38	0.38	0.38	No detected concentrations	NA
Nickel										
Smoky Creek	mg/kg dw	2	0	100%	21.4	23.2	23.2	23.2	Only 2 detected concentrations	NA
Roberts Creek	mg/kg dw	1	0	100%	9.9	9.9	9.9	9.9	Only 1 detected concentration	NA
Tygee Creek	mg/kg dw	1	0	100%	12.9	12.9	12.9	12.9	Only 1 detected concentration	NA
Pole Canyon Creek	mg/kg dw	4	0	100%	85.5	277	277	277	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/kg dw	1	0	100%	21.7	21.7	21.7	21.7	Only 1 detected concentration	NA
Sage Creek	mg/kg dw	4	0	100%	22	36.1	36.1	33.98	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Spring	mg/kg dw	1	0	100%	3.9	3.9	3.9	3.9	Only 1 detected concentration	NA
South Fork Sage Creek	mg/kg dw	1	0	100%	15	15	15	15	Only 1 detected concentration	NA
Lower Sage Valley	mg/kg dw	4	0	100%	10.5	17.5	17.5	17.5	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg dw	2	0	100%	6.8	8.1	8.1	8.1	Only 2 detected concentrations	NA

TABLE 3-6
Sediment EPC for ECOPCs by Drainage

Drainage/Analyte	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentration		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC[2]	Distribution	Estimation Method
Selenium										
Smoky Creek	mg/kg dw	2	0	100%	0.62	0.63	0.63	0.63	Only 2 detected concentrations	NA
Roberts Creek	mg/kg dw	1	0	100%	0.4	0.4	0.4	0.4	Only 1 detected concentration	NA
Tygee Creek	mg/kg dw	1	0	100%	0.73	0.73	0.73	0.73	Only 1 detected concentration	NA
Pole Canyon Creek	mg/kg dw	21	0	100%	1.7	96.7	96.7	33.51	Gamma Distribution	95% Adjusted Gamma UCL
North Fork Sage Creek	mg/kg dw	1	0	100%	6.5	6.5	6.5	6.5	Only 1 detected concentration	NA
Sage Creek	mg/kg dw	4	0	100%	0.39	1.6	1.6	1.441	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Spring	mg/kg dw	1	0	100%	10.5	10.5	10.5	10.5	Only 1 detected concentration	NA
South Fork Sage Creek	mg/kg dw	1	0	100%	1.2	1.2	1.2	1.2	Only 1 detected concentration	NA
Lower Sage Valley	mg/kg dw	4	0	100%	1.6	7	7	7	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg dw	2	0	100%	0.6	1.5	1.5	1.5	Only 2 detected concentrations	NA
Silver										
Smoky Creek	mg/kg dw	2	0	100%	0.11	0.26	0.26	0.26	Only 2 detected concentrations	NA
Roberts Creek	mg/kg dw	1	0	100%	0.27	0.27	0.27	0.27	Only 1 detected concentration	NA
Tygee Creek	mg/kg dw	1	0	100%	0.14	0.14	0.14	0.14	Only 1 detected concentration	NA
Pole Canyon Creek	mg/kg dw	4	0	100%	0.93	3.6	3.6	3.6	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/kg dw	1	0	100%	0.19	0.19	0.19	0.19	Only 1 detected concentration	NA
Sage Creek	mg/kg dw	4	0	100%	0.09	0.72	0.72	0.624	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Spring	mg/kg dw	1	0	100%	0.64	0.64	0.64	0.64	Only 1 detected concentration	NA
South Fork Sage Creek	mg/kg dw	1	0	100%	0.21	0.21	0.21	0.21	Only 1 detected concentration	NA
Lower Sage Valley	mg/kg dw	4	1	75%	0.13	0.23	0.23	0.23	Only 3 detected concentrations	NA
Crow Creek	mg/kg dw	2	0	100%	0.078	0.082	0.082	0.082	Only 2 detected concentrations	NA
Thallium										
Smoky Creek	mg/kg dw	2	0	100%	0.17	0.2	0.2	0.2	Only 2 detected concentrations	NA
Roberts Creek	mg/kg dw	1	0	100%	0.12	0.12	0.12	0.12	Only 1 detected concentration	NA
Tygee Creek	mg/kg dw	1	0	100%	0.17	0.17	0.17	0.17	Only 1 detected concentration	NA
Pole Canyon Creek	mg/kg dw	4	0	100%	0.41	1.1	1.1	1.1	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/kg dw	1	0	100%	0.18	0.18	0.18	0.18	Only 1 detected concentration	NA
Sage Creek	mg/kg dw	4	0	100%	0.16	0.32	0.32	0.295	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Spring	mg/kg dw	1	0	100%	0.33	0.33	0.33	0.33	Only 1 detected concentration	NA
South Fork Sage Creek	mg/kg dw	1	0	100%	0.22	0.22	0.22	0.22	Only 1 detected concentration	NA
Lower Sage Valley	mg/kg dw	4	0	100%	0.14	0.23	0.23	0.253	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg dw	2	0	100%	0.12	0.15	0.15	0.15	Only 2 detected concentrations	NA

TABLE 3-6
Sediment EPC for ECOPCs by Drainage

Drainage/Analyte	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentration		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC[2]	Distribution	Estimation Method
Vanadium										
Smoky Creek	mg/kg dw	2	0	100%	23.8	29.6	29.6	29.6	Only 2 detected concentrations	NA
Roberts Creek	mg/kg dw	1	0	100%	26.1	26.1	26.1	26.1	Only 1 detected concentration	NA
Tygee Creek	mg/kg dw	1	0	100%	21.8	21.8	21.8	21.8	Only 1 detected concentration	NA
Pole Canyon Creek	mg/kg dw	4	0	100%	62.9	206	206	206	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/kg dw	1	0	100%	30.2	30.2	30.2	30.2	Only 1 detected concentration	NA
Sage Creek	mg/kg dw	4	0	100%	21	88.9	88.9	78.45	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Spring	mg/kg dw	1	0	100%	34.5	34.5	34.5	34.5	Only 1 detected concentration	NA
South Fork Sage Creek	mg/kg dw	1	0	100%	34.3	34.3	34.3	34.3	Only 1 detected concentration	NA
Lower Sage Valley	mg/kg dw	4	0	100%	22.2	26.7	26.7	26.7	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg dw	2	0	100%	14.4	15.2	15.2	15.2	Only 2 detected concentrations	NA
Zinc										
Smoky Creek	mg/kg dw	2	0	100%	94.5	104	104	104	Only 2 detected concentrations	NA
Roberts Creek	mg/kg dw	1	0	100%	66.4	66.4	66.4	66.4	Only 1 detected concentration	NA
Tygee Creek	mg/kg dw	1	0	100%	61.5	61.5	61.5	61.5	Only 1 detected concentration	NA
Pole Canyon Creek	mg/kg dw	4	0	100%	403	1280	1280	1280	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/kg dw	1	0	100%	95.1	95.1	95.1	95.1	Only 1 detected concentration	NA
Sage Creek	mg/kg dw	4	0	100%	69.7	135	135	133.3	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Spring	mg/kg dw	1	0	100%	53.2	53.2	53.2	53.2	Only 1 detected concentration	NA
South Fork Sage Creek	mg/kg dw	1	0	100%	85.9	85.9	85.9	85.9	Only 1 detected concentration	NA
Lower Sage Valley	mg/kg dw	4	0	100%	61.1	78.9	78.9	77.22	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg dw	2	0	100%	40.5	48.8	48.8	48.8	Only 2 detected concentrations	NA

Notes:

COI - Chemical of Interest, ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, ERA - Ecological Risk Assessment, NA - Not Available

mg/kg dw - milligram per kilogram dry weight, UCL - Upper Confidence Limit

1. Maximum detected concentration used for EPC value due to small sample size; In absence of detected concentrations, max non-detect values are used.

2. When the calculated 95 UCL was greater than the maximum concentration, the maximum concentration was selected as the EPC.

TABLE 3-7
Trout Tissue EPC for ECOPCs by Drainage

Drainage/Analyte	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC[2]	Distribution	Estimation Method
Aluminum										
Smoky Creek	mg/kg	2	0	100%	196.4	407.7	407.7	407.7	Only 2 detected concentrations	NA
Tygee Creek	mg/kg	7	0	100%	83.5	188	188	167.2	Assuming Normal Distribution	95% Student's-t UCL
Sage Creek	mg/kg	33	0	100%	4	477	477	143.7	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Springs	mg/kg	14	0	100%	6.7	346.7	346.7	170.9	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
South Fork Sage Creek	mg/kg	13	0	100%	18.9	109	109	65.04	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	45	0	100%	6.2	221	221	76.21	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Crow Creek	mg/kg	27	0	100%	9.4	214	214	77.86	Assuming Normal Distribution	95% Student's-t UCL
Barium										
Smoky Creek	mg/kg	2	0	100%	3.52	4.38	4.378	4.38	Only 2 detected concentrations	NA
Tygee Creek	mg/kg	7	0	100%	2.12	4.88	4.88	4.7	Assuming Normal Distribution	95% Student's-t UCL
Sage Creek	mg/kg	32	0	100%	0.81	3.79	3.79	1.95	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Springs	mg/kg	14	0	100%	1.16	5.74	5.74	3.3	Assuming Gamma Distribution	95% Adjusted Gamma UCL
South Fork Sage Creek	mg/kg	13	0	100%	0.91	2.9	2.9	1.76	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	45	0	100%	0.83	3.81	3.81	2.14	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg	27	0	100%	0.89	5.81	5.81	2.57	Assuming Normal Distribution	95% Student's-t UCL
Cadmium										
Smoky Creek	mg/kg	2	0	100%	0.86	2	2	2	Only 2 detected concentrations	NA
Tygee Creek	mg/kg	7	0	100%	0.056	0.85	0.85	0.48	Assuming Normal Distribution	95% Student's-t UCL
Sage Creek	mg/kg	33	0	100%	0.08	0.95	0.95	0.39	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Springs	mg/kg	14	0	100%	0.036	0.39	0.39	0.19	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	13	0	100%	0.23	0.71	0.71	0.48	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	45	0	100%	0.036	0.24	0.24	0.12	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg	27	0	100%	0.033	0.48	0.48	0.12	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Chromium										
Smoky Creek	mg/kg	2	0	100%	0.67	1.41	1.41	1.41	Only 2 detected concentrations	NA
Tygee Creek	mg/kg	7	0	100%	0.38	0.78	0.78	0.64	Assuming Normal Distribution	95% Student's-t UCL
Sage Creek	mg/kg	33	1	97%	0.1	2.96	2.96	1.0	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
Hoopes Springs	mg/kg	14	0	100%	0.17	14.86	14.86	7.45	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
South Fork Sage Creek	mg/kg	13	0	100%	0.23	3.04	3.04	1.46	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Lower Sage Creek	mg/kg	45	2	96%	0.08	4.8	4.8	1.23	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (Chebyshev) UCL
Crow Creek	mg/kg	27	0	100%	0.1	1.76	1.76	0.72	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Cobalt										
Smoky Creek	mg/kg	2	0	100%	0.24	0.37	0.37	0.37	Only 2 detected concentrations	NA
Tygee Creek	mg/kg	7	0	100%	0.14	0.24	0.24	0.21	Assuming Normal Distribution	95% Student's-t UCL
Sage Creek	mg/kg	33	0	100%	0.10	0.47	0.47	0.24	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Springs	mg/kg	14	0	100%	0.10	0.31	0.31	0.23	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	13	0	100%	0.06	0.24	0.24	0.16	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	45	0	100%	0.039	0.36	0.36	0.18	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Crow Creek	mg/kg	27	0	100%	0.04	0.31	0.31	0.13	Assuming Normal Distribution	95% Student's-t UCL

TABLE 3-7
Trout Tissue EPC for ECOPCs by Drainage

Drainage/Analyte	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC[2]	Distribution	Estimation Method
Copper										
Smoky Creek	mg/kg	2	0	100%	4.4	4.44	4.44	4.44	Only 2 detected concentrations	NA
Tygee Creek	mg/kg	7	0	100%	2.9	4.86	4.86	4.10	Assuming Normal Distribution	95% Student's-t UCL
Sage Creek	mg/kg	33	0	100%	2.63	24.3	24.3	6.67	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Springs	mg/kg	14	0	100%	2.46	5.51	5.51	4.33	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	13	0	100%	2.75	7.5	7.5	5.40	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	45	0	100%	2.33	16.2	16.2	7.35	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
Crow Creek	mg/kg	27	0	100%	2.22	39.7	39.7	11.24	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
Iron										
Smoky Creek	mg/kg	2	0	100%	184	322	322	322	Only 2 detected concentrations	NA
Tygee Creek	mg/kg	7	0	100%	99	173	173	156.3	Assuming Normal Distribution	95% Student's-t UCL
Sage Creek	mg/kg	33	0	100%	52	356	356	153.9	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Springs	mg/kg	14	0	100%	47	184	184	101.1	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	13	0	100%	41	114	114	93.0	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	45	0	100%	45	245	245	114.2	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Crow Creek	mg/kg	27	0	100%	46	185	185	100.9	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Manganese										
Smoky Creek	mg/kg	2	0	100%	19.1	23.8	23.8	23.8	Only 2 detected concentrations	NA
Tygee Creek	mg/kg	7	0	100%	15.7	31.7	31.7	26.5	Assuming Normal Distribution	95% Student's-t UCL
Sage Creek	mg/kg	33	0	100%	4.07	29.2	29.2	14.5	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Springs	mg/kg	14	0	100%	3.14	17.5	17.5	9.01	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	13	0	100%	4.27	13.2	13.2	10.65	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	45	0	100%	4.53	50.4	50.4	21.65	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Crow Creek	mg/kg	27	0	100%	5.81	25	25	13.34	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Nickel										
Smoky Creek	mg/kg	2	0	100%	0.47	0.69	0.69	0.69	Only 2 detected concentrations	NA
Tygee Creek	mg/kg	7	0	100%	0.24	3.64	3.64	2.86	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
Sage Creek	mg/kg	33	4	88%	0.25	1.75	1.75	0.85	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (Chebyshev) UCL
Hoopes Springs	mg/kg	14	0	100%	0.26	2.17	2.17	1.26	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
South Fork Sage Creek	mg/kg	13	0	100%	0.29	1.05	1.05	0.64	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	45	0	100%	0.23	1.9	1.9	0.61	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg	27	0	100%	0.2	0.95	0.95	0.47	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Selenium										
Smoky Creek	mg/kg	2	0	100%	4.16	5.31	5.31	5.31	Only 2 detected concentrations	NA
Tygee Creek	mg/kg	7	0	100%	2.44	8.28	8.28	6.17	Assuming Normal Distribution	95% Student's-t UCL
Sage Creek	mg/kg	33	0	100%	2.33	9.62	9.62	4.27	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Springs	mg/kg	14	0	100%	11.9	25.2	25.2	21.54	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	13	0	100%	8.53	17.5	17.5	13.98	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	45	0	100%	2.33	28.3	28.3	17.85	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg	27	0	100%	5.62	16.8	16.8	11.55	Assuming Gamma Distribution	95% Adjusted Gamma UCL

TABLE 3-7
Trout Tissue EPC for ECOPCs by Drainage

Drainage/Analyte	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC[2]	Distribution	Estimation Method
Vanadium										
Smoky Creek	mg/kg	2	0	100%	0.64	1.1	1.1	1.1	Only 2 detected concentrations	NA
Tygee Creek	mg/kg	7	0	100%	0.26	0.49	0.49	0.46	Only 2 detected concentrations	NA
Sage Creek	mg/kg	33	0	100%	0.01	1.01	1.01	0.37	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
Hoopes Springs	mg/kg	14	0	100%	0.1	2.79	2.79	0.92	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (BCA) UCL
South Fork Sage Creek	mg/kg	13	0	100%	0.18	0.6	0.6	0.36	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (Chebyshev) UCL
Lower Sage Creek	mg/kg	45	0	100%	0.09	0.69	0.69	0.35	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (BCA) UCL
Crow Creek	mg/kg	27	0	100%	0.1	0.67	0.67	0.29	Assuming Normal Distribution	95% Student's-t UCL
Zinc										
Smoky Creek	mg/kg	2	0	100%	85.8	101.1	101.1	101.1	Only 2 detected concentrations	NA
Tygee Creek	mg/kg	7	0	100%	70.2	98.2	98.2	92.31	Assuming Normal Distribution	95% Student's-t UCL
Sage Creek	mg/kg	33	0	100%	62.2	100	100	82.9	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Springs	mg/kg	14	0	100%	115.5	186	186	164	Assuming Lognormal Distribution	95% H-UCL
South Fork Sage Creek	mg/kg	13	0	100%	101.4	205	205	160	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	45	0	100%	74.8	214	214	148.4	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg	27	0	100%	61.2	232	232	148.6	Assuming Normal Distribution	95% Student's-t UCL

Notes:

COI - Chemical of Interest, ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, ERA - Ecological Risk Assessment, NA - Not Available, mg/kg - milligram per kilogram, EPC - Exposure Point Concentration

UCL - Upper Confidence Limit

1. Maximum detected concentration used for EPC value due to small sample size; In absence of detected concentrations, max non-detect values are used.

2. When the calculated 95 UCL was greater than the maximum concentration, the maximum concentration was selected as the EPC.

TABLE 3-8
Sculpin Tissue EPC for ECOPCs by Drainage

Drainage/Analyte	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC[2]	Distribution	Estimation Method
Aluminum										
Tygee Creek	mg/kg	10	0	100%	187	716	716	410.3	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Springs	mg/kg	10	0	100%	17.1	55.3	55.3	38.4	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	4	0	100%	54.7	125	125	119.7	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	31	0	100%	12.9	285	285	103.2	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg	20	0	100%	22.8	330	330	207	Assuming Normal Distribution	95% Student's-t UCL
Barium										
Tygee Creek	mg/kg	10	0	100%	8.62	15	15	11.72	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Springs	mg/kg	10	0	100%	3.08	4.87	4.87	4.18	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	4	0	100%	3.86	6.25	6.25	6.21	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	31	0	100%	3.33	6.54	6.54	4.99	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg	20	0	100%	5.03	11.8	11.8	8.21	Assuming Normal Distribution	95% Student's-t UCL
Cadmium										
Tygee Creek	mg/kg	10	0	100%	0.08	1.01	1.01	0.65	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
Hoopes Springs	mg/kg	10	0	100%	0.05	0.14	0.14	0.12	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	4	0	100%	0.20	0.35	0.35	0.33	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	31	0	100%	0.048	0.28	0.28	0.11	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Crow Creek	mg/kg	20	0	100%	0.041	0.19	0.19	0.12	Assuming Normal Distribution	95% Student's-t UCL
Chromium										
Tygee Creek	mg/kg	10	0	100%	0.77	2.23	2.23	1.47	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Hoopes Springs	mg/kg	10	0	100%	0.24	0.68	0.68	0.56	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	4	0	100%	0.37	0.74	0.74	0.72	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	31	1	97%	0.13	1.48	1.48	0.53	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (BCA) UCL
Crow Creek	mg/kg	20	0	100%	0.29	2.55	2.55	1.1	Assuming Normal Distribution	95% Student's-t UCL
Cobalt										
Tygee Creek	mg/kg	10	0	100%	0.145	0.28	0.28	0.24	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Springs	mg/kg	10	0	100%	0.118	0.20	0.20	0.17	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	4	0	100%	0.116	0.20	0.20	0.19	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	31	0	100%	0.08	0.45	0.45	0.19	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg	20	0	100%	0.081	0.24	0.24	0.16	Assuming Normal Distribution	95% Student's-t UCL
Copper										
Tygee Creek	mg/kg	10	0	100%	2.34	4.53	4.53	3.74	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Springs	mg/kg	10	0	100%	1.93	2.55	2.55	2.42	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	4	0	100%	2.38	2.75	2.75	2.71	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	31	0	100%	2.18	3.67	3.67	3.01	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg	20	0	100%	1.88	3.22	3.22	2.70	Assuming Normal Distribution	95% Student's-t UCL
Iron										
Tygee Creek	mg/kg	10	0	100%	167	488	488	309.8	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Hoopes Springs	mg/kg	10	0	100%	48	89	89	74.9	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	4	0	100%	83	120	120	115.9	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	31	0	100%	57	276	276	124.7	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg	20	0	100%	54	256	256	185.4	Assuming Normal Distribution	95% Student's-t UCL

TABLE 3-8
Sculpin Tissue EPC for ECOPCs by Drainage

Drainage/Analyte	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC[2]	Distribution	Estimation Method
Manganese										
Tygee Creek	mg/kg	10	0	100%	20.1	59	59	37.64	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Hoopes Springs	mg/kg	10	0	100%	4.15	23.1	23.1	12.3	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	4	0	100%	10.3	13.5	13.5	13.75	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	31	0	100%	8.67	48.5	48.5	24.1	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg	20	0	100%	11.1	31.5	31.5	21.24	Assuming Normal Distribution	95% Student's-t UCL
Nickel										
Tygee Creek	mg/kg	10	0	100%	0.47	0.88	0.88	0.65	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Hoopes Springs	mg/kg	10	0	100%	0.4	0.7	0.7	0.58	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	4	0	100%	0.45	0.57	0.57	0.58	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	31	0	100%	0.38	0.71	0.71	0.55	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg	20	0	100%	0.5	0.98	0.98	0.74	Assuming Normal Distribution	95% Student's-t UCL
Selenium										
Tygee Creek	mg/kg	10	0	100%	3.36	5.41	5.41	4.78	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Springs	mg/kg	10	0	100%	14.4	20.3	20.3	18.37	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	4	0	100%	13.5	17.9	17.9	17.77	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	31	0	100%	10.9	35.7	35.7	20.22	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg	20	0	100%	3.2	16.2	16.2	11.95	Assuming Normal Distribution	95% Student's-t UCL
Vanadium										
Tygee Creek	mg/kg	10	0	100%	1.29	2.15	2.15	1.78	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Springs	mg/kg	10	0	100%	0.36	0.84	0.84	0.64	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	4	0	100%	0.72	1.02	1.02	1.04	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	31	0	100%	0.7	1.78	1.78	1.22	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg	20	0	100%	1.04	2.29	2.29	1.67	Assuming Normal Distribution	95% Student's-t UCL
Zinc										
Tygee Creek	mg/kg	10	0	100%	58.3	113	113	85.4	Assuming Normal Distribution	95% Student's-t UCL
Hoopes Springs	mg/kg	10	0	100%	53.9	74.8	74.8	66.1	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/kg	4	0	100%	58.4	68.8	68.8	70.0	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Creek	mg/kg	31	0	100%	42.2	87.1	87.1	63.0	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/kg	20	0	100%	49.9	109	109	78.1	Assuming Normal Distribution	95% Student's-t UCL

Notes:

COI - Chemical of Interest, ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, ERA - Ecological Risk Assessment, NA - Not Available, mg/kg - milligram per kilogram, EPC - Exposure Point Concentration

UCL - Upper Confidence Limit

1. Maximum detected concentration used for EPC value due to small sample size; In absence of detected concentrations, max non-detect values are used.

2. When the calculated 95 UCL was greater than the maximum concentration, the maximum concentration was selected as the EPC.

TABLE 3-9
Surface Water Sample Site Groupings by Drainage

Drainage Group	Site Name	Subdivision	Significant Input of Flow or Potential Source
Smoky Creek	USm	Upstream	Haul Road and Mine workings
	LSm, LSmS	Downstream	
Tygee Creek/Roberts Creek	ET, UT-1, UR-3	Upstream	Tailings pond, wth upper Tygee and Roberts Creek being upstream of the tailings pond.
	LT-3	Downstream	
Pole Canyon Creek	UP-IN, LP-PD, UP-PD	Upstream	Pole Canyon ODA - Note LP-PD discharges below the ODA, but there are no source inputs to this local discharge because it is piped from upstream of the ODA and the water quality there is the same, except during the infiltration basin operational issue, as upstream Pole Canyon Creek water.
	LP-1	Downstream	
North Fork Sage Creek	NSV-2, -3, -4,-5	Upstream	Pole Canyon Creek
	NSV-6, NSV-6b, NSV-6c, NSV-6d	Downstream	
Sage Creek	US, US-2, US-2a, US-3, US-3a, US-4, US-4a, US-4e, US-A, US-B, AWI012-25	Upstream	Haul Road and Mine workings
	LS, LS-A, LS-B, LS-C, SV-1	Downstream	
Hoopes Spring	HS, HS-2, HS-3, HS-A1, HS-A2, HS-C1	Downstream	Hoopes Spring
South Fork Sage Creek	USS, LSS-US, SW-SFSC-500	Upstream	Haul Road and Mine workings
	LSS, LSS-M1, LSS-M2, LSS-2, LSS-SPO, LSS-SP-N1, LSS-SP-N2, LSS-SP-S1, LSS-SP-S2, LSS-SP-N	Downstream	
Lower Sage Valley	LSV-0, LSV-0A, LSV-1,LSV-1a, LSV-1c, LSV-SP1	Upstream	Hoopes Spring
	LSV-1b, LSV-2, LSV-2a, LSV-2c, LSV-3, LSV-3a, LSV-4	Downstream	
Crow Creek	CC-350, 150, 75	Upstream	Lower Sage Creek
	CC-1A, 3A, WY-01, Crow LC	Downstream	

Notes:

ODA - Overburden Disposal Area

TABLE 3-10
Surface Water EPC for ECOPCs by Drainage and Location Relative to Inputs

Drainage/Analyte	Units	Upstream/ Downstream	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
						Min	Max		EPC[2]	Dist.	Estimation Method
Aluminum, Total											
Smoky Creek	mg/L	Upstream	2	0	100.0%	0.42	0.43	0.43	0.43	Only 2 detected concentrations [1]	NA
	mg/L	Downstream	4	0	100.0%	0.067	0.98	0.98	0.85	Assuming Normal Distribution	95% Student's-t UCL
Tygee Creek [3]	mg/L	Upstream	5	0	100.0%	0.088	2.05	2.05	1.57	Assuming Normal Distribution	95% Student's-t UCL
	mg/L	Downstream	2	0	100.0%	0.11	0.11	0.11	0.11	Only 2 detected concentrations [1]	NA
Pole Canyon Creek	mg/L	Upstream	4	1	75.0%	0.021	0.62	0.62	0.62	Only 3 detected concentrations [1]	NA
	mg/L	Downstream	8	7	12.5%	0.032	0.032	0.032	0.032	Only 1 detected concentration [1]	NA
North Fork Sage Creek	mg/L	Upstream	8	0	100.0%	0.097	3.61	3.61	2.47	Assuming Gamma Distribution	95% Adjusted Gamma UCL
	mg/L	Downstream	4	0	100.0%	0.70	2.24	2.24	2.24	Assuming Normal Distribution [2]	95% Student's-t UCL
Sage Creek	mg/L	Upstream	4	1	75.0%	0.020	0.34	0.34	0.34	Only 3 detected concentrations [1]	NA
	mg/L	Downstream	3	0	100.0%	0.032	2.07	2.07	2.07	Only 3 detected concentrations [1]	NA
Hoopes Spring	mg/L	NA	12	7	41.7%	0.02	0.033	0.033	0.024	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
South Fork Sage Creek	mg/L	Upstream	2	1	50.0%	0.91	0.91	0.91	0.91	Only 1 detected concentration [1]	NA
	mg/L	Downstream	18	9	50.0%	0.024	7.4	7.4	1.93	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
Lower Sage Valley	mg/L	Upstream	6	2	66.7%	0.13	1.17	1.17	0.75	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
	mg/L	Downstream	14	1	92.9%	0.033	1.19	1.19	0.46	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
Crow Creek	mg/L	Upstream	4	0	100.0%	0.32	0.95	0.95	0.90	Assuming Normal Distribution	95% Student's-t UCL
	mg/L	Downstream	8	0	100.0%	0.099	0.90	0.90	0.54	Assuming Normal Distribution	95% Student's-t UCL
Arsenic, Dissolved											
Smoky Creek	mg/L	Upstream	2	1	50.0%	0.00056	0.00056	0.00056	0.00056	Only 1 detected concentration [1]	NA
	mg/L	Downstream	4	2	50.0%	0.00049	0.00093	0.00093	0.00093	Only 2 detected concentrations [1]	NA
Tygee Creek [3]	mg/L	Upstream	5	0	100.0%	0.00058	0.00135	0.00135	0.00132	Assuming Normal Distribution	95% Student's-t UCL
	mg/L	Downstream	2	0	100.0%	0.00071	0.0014	0.0014	0.0014	Only 2 detected concentrations [1]	NA
Pole Canyon Creek	mg/L	Upstream	4	3	25.0%	0.00087	0.00087	0.00087	0.00087	Only 1 detected concentration [1]	NA
	mg/L	Downstream	8	0	100.0%	0.0005	0.27	0.27	0.27	Nonparametric Distribution Free UCLs [2]	95% Hall's Bootstrap UCL
North Fork Sage Creek	mg/L	Upstream	8	0	100.0%	0.0005	0.0017	0.0017	0.0013	Assuming Normal Distribution	95% Student's-t UCL
	mg/L	Downstream	4	1	75.0%	0.00064	0.0016	0.0016	0.0016	Only 3 detected concentrations [1]	NA
Sage Creek	mg/L	Upstream	4	3	25.0%	0.00046	0.00046	0.00046	0.00046	Only 1 detected concentration [1]	NA
	mg/L	Downstream	3	2	33.3%	0.00061	0.00061	0.00061	0.00061	Only 1 detected concentration [1]	NA
Hoopes Spring	mg/L	NA	12	0	100.0%	0.0007	0.0033	0.0033	0.00276	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/L	Upstream	2	2	0.0%	NA	NA	0.00043	0.00043	No detected concentrations [1]	NA
	mg/L	Downstream	18	5	72.2%	0.00045	0.0022	0.0022	0.00096	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (BCA) UCL
Lower Sage Valley	mg/L	Upstream	6	2	66.7%	0.00044	0.00063	0.00063	0.00056	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
	mg/L	Downstream	14	0	100.0%	0.00047	0.0023	0.0023	0.0017	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/L	Upstream	4	1	75.0%	0.00073	0.00088	0.00088	0.00088	Only 3 detected concentrations [1]	NA
	mg/L	Downstream	8	0	100.0%	0.00071	0.0019	0.0019	0.0013	Assuming Normal Distribution	95% Student's-t UCL

TABLE 3-10
Surface Water EPC for ECOPCs by Drainage and Location Relative to Inputs

Drainage/Analyte	Units	Upstream/ Downstream	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
						Min	Max		EPC[2]	Dist.	Estimation Method
Cadmium, Dissolved											
Smoky Creek	mg/L	Upstream	2	2	0.0%	NA	NA	0.000036	0.000036	No detected concentrations [1]	NA
	mg/L	Downstream	4	4	0.0%	NA	NA	0.000039	0.000039	No detected concentrations [1]	NA
Tygee Creek [3]	mg/L	Upstream	5	5	0.0%	NA	NA	0.000063	0.000063	No detected concentrations [1]	NA
	mg/L	Downstream	2	1	50.0%	0.000111	0.000111	0.000111	0.000111	Only 1 detected concentration [1]	NA
Pole Canyon Creek	mg/L	Upstream	4	3	25.0%	0.00011	0.00011	0.00011	0.00011	Only 1 detected concentration [1]	NA
	mg/L	Downstream	8	0	100.0%	0.017	0.033	0.033	0.027	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/L	Upstream	8	8	0.0%	NA	NA	0.000036	0.000036	No detected concentrations [1]	NA
	mg/L	Downstream	4	3	25.0%	0.00002	0.000020	0.000020	0.00002	Only 1 detected concentration [1]	NA
Sage Creek	mg/L	Upstream	4	4	0.0%	NA	NA	0.000036	0.000036	No detected concentrations [1]	NA
	mg/L	Downstream	3	3	0.0%	NA	NA	0.000036	0.000036	No detected concentrations [1]	NA
Hoopes Spring	mg/L	NA	17	17	0.0%	NA	NA	0.00012	0.00012	No detected concentrations [1]	NA
South Fork Sage Creek	mg/L	Upstream	2	2	0.0%	NA	NA	0.000036	0.000036	No detected concentrations [1]	NA
	mg/L	Downstream	18	16	11.1%	0.000042	0.000078	0.000078	0.000078	Only 1 detected concentration [1]	NA
Lower Sage Valley	mg/L	Upstream	6	6	0.0%	NA	NA	0.000036	0.000036	No detected concentrations [1]	NA
	mg/L	Downstream	14	12	14.3%	0.000042	0.000050	0.00005	0.00005	Only 2 detected concentrations [1]	NA
Crow Creek	mg/L	Upstream	4	4	0.0%	NA	NA	0.000036	0.000036	No detected concentrations [1]	NA
	mg/L	Downstream	8	6	25.0%	0.000017	0.000036	0.000036	0.000036	Only 2 detected concentrations [1]	NA
Iron, Total											
Smoky Creek	mg/L	Upstream	2	0	100.0%	0.32	0.34	0.34	0.34	Only 2 detected concentrations [1]	NA
	mg/L	Downstream	4	0	100.0%	0.081	0.89	0.89	0.78	Assuming Normal Distribution	95% Student's-t UCL
Tygee Creek [3]	mg/L	Upstream	5	0	100.0%	0.09	1.22	1.22	0.99	Assuming Normal Distribution	95% Student's-t UCL
	mg/L	Downstream	2	0	100.0%	0.092	0.3	0.3	0.3	Only 2 detected concentrations [1]	NA
Pole Canyon Creek	mg/L	Upstream	4	2	50.0%	0.028	0.46	0.46	0.46	Only 2 detected concentrations [1]	NA
	mg/L	Downstream	8	7	12.5%	0.061	0.061	0.061	0.061	Only 1 detected concentration [1]	NA
North Fork Sage Creek	mg/L	Upstream	8	0	100.0%	0.12	2.75	2.75	1.85	Assuming Gamma Distribution	95% Adjusted Gamma UCL
	mg/L	Downstream	4	0	100.0%	0.97	2.29	2.29	2.29	Assuming Normal Distribution [2]	95% Student's-t UCL
Sage Creek	mg/L	Upstream	4	2	50.0%	0.24	0.25	0.25	0.25	Only 2 detected concentrations [1]	NA
	mg/L	Downstream	3	0	100.0%	0.065	1.55	1.55	1.55	Only 3 detected concentrations [1]	NA
Hoopes Spring	mg/L	NA	12	8	33.3%	0.028	0.052	0.052	0.03	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
South Fork Sage Creek	mg/L	Upstream	2	1	50.0%	0.64	0.64	0.64	0.64	Only 1 detected concentration [1]	NA
	mg/L	Downstream	18	9	50.0%	0.033	5.75	5.75	1.47	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
Lower Sage Valley	mg/L	Upstream	6	2	66.7%	0.17	0.99	0.99	0.65	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
	mg/L	Downstream	14	0	100.0%	0.024	1.04	1.04	0.40	Assuming Normal Distribution	95% Student's-t UCL
Crow Creek	mg/L	Upstream	4	0	100.0%	0.21	0.72	0.72	0.69	Assuming Normal Distribution	95% Student's-t UCL
	mg/L	Downstream	8	0	100.0%	0.083	0.69	0.69	0.42	Assuming Normal Distribution	95% Student's-t UCL

TABLE 3-10
Surface Water EPC for ECOPCs by Drainage and Location Relative to Inputs

Drainage/Analyte	Units	Upstream/ Downstream	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
						Min	Max		EPC[2]	Dist.	Estimation Method
Nickel, Dissolved											
Smoky Creek	mg/L	Upstream	2	0	100.0%	0.0024	0.003	0.003	0.003	Only 2 detected concentrations [1]	NA
	mg/L	Downstream	4	0	100.0%	0.0023	0.0035	0.0035	0.0034	Assuming Normal Distribution	95% Student's-t UCL
Tygee Creek [3]	mg/L	Upstream	5	0	100.0%	0.0028	0.00350	0.00350	0.0034	Assuming Normal Distribution	95% Student's-t UCL
	mg/L	Downstream	2	0	100.0%	0.0035	0.0040	0.0040	0.0040	Only 2 detected concentrations [1]	NA
Pole Canyon Creek	mg/L	Upstream	4	0	100.0%	0.0019	0.0025	0.0025	0.0026	Assuming Normal Distribution	95% Student's-t UCL
	mg/L	Downstream	8	0	100.0%	0.26	0.52	0.52	0.43	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/L	Upstream	8	0	100.0%	0.0019	0.0043	0.0043	0.0037	Assuming Normal Distribution	95% Student's-t UCL
	mg/L	Downstream	4	0	100.0%	0.0047	0.0058	0.0058	0.0058	Assuming Normal Distribution [2]	95% Student's-t UCL
Sage Creek	mg/L	Upstream	4	0	100.0%	0.0021	0.0022	0.0022	0.0022	Assuming Normal Distribution	95% Student's-t UCL
	mg/L	Downstream	3	0	100.0%	0.0025	0.0026	0.0026	0.0026	Only 3 detected concentrations [1]	NA
Hoopes Spring	mg/L	NA	12	0	100.0%	0.0026	0.0029	0.0029	0.0028	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/L	Upstream	2	0	100.0%	0.0014	0.0027	0.0027	0.0027	Only 2 detected concentrations [1]	NA
	mg/L	Downstream	18	0	100.0%	0.0011	0.0033	0.0033	0.0024	Assuming Normal Distribution	95% Student's-t UCL
Lower Sage Valley	mg/L	Upstream	6	0	100.0%	0.0028	0.0033	0.0033	0.0032	Assuming Normal Distribution	95% Student's-t UCL
	mg/L	Downstream	14	0	100.0%	0.0024	0.0038	0.0038	0.0030	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Crow Creek	mg/L	Upstream	4	0	100.0%	0.0026	0.003	0.003	0.003	Assuming Normal Distribution [2]	95% Student's-t UCL
	mg/L	Downstream	8	0	100.0%	0.0028	0.0033	0.0033	0.0032	Assuming Normal Distribution	95% Student's-t UCL
Selenium, Total											
Smoky Creek	mg/L	Upstream	2	2	0.0%	NA	NA	0.0002	0.0002	No detected concentrations [1]	NA
	mg/L	Downstream	4	2	50.0%	0.00037	0.0004	0.0004	0.0004	Only 2 detected concentration [1]	NA
Tygee Creek [3]	mg/L	Upstream	5	3	40.0%	0.00023	0.00068	0.00068	0.00068	Only 2 detected concentrations [1]	NA
	mg/L	Downstream	2	1	50.0%	0.00055	0.00055	0.00055	0.00055	Only 1 detected concentration [1]	NA
Pole Canyon Creek	mg/L	Upstream	10	6	40.0%	0.00023	0.00045	0.00045	0.00035	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
	mg/L	Downstream	8	0	100.0%	3.6	6.62	6.62	5.829	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/L	Upstream	8	4	50.0%	0.00024	0.00093	0.00093	0.00052	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
	mg/L	Downstream	7	0	100.0%	0.001	0.012	0.012	0.012	Nonparametric Distribution Free UCLs [2]	95% Hall's Bootstrap UCL
Sage Creek	mg/L	Upstream	15	13	13.3%	0.00028	0.00091	0.00091	0.00091	Only 2 detected concentrations [1]	NA
	mg/L	Downstream	7	6	14.3%	0.00021	0.00021	0.00021	0.00021	Only 1 detected concentrations [1]	NA
Hoopes Spring	mg/L	NA	13	0	100.0%	0.012	0.054	0.054	0.043	Assuming Normal Distribution	95% Student's-t UCL
South Fork Sage Creek	mg/L	Upstream	2	1	50.0%	0.00052	0.00052	0.00052	0.00052	Only 1 detected concentration [1]	NA
	mg/L	Downstream	32	3	90.6%	0.0012	0.046	0.046	0.015	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (Chebyshev) UCL
Lower Sage Valley	mg/L	Upstream	10	2	80.0%	0.00044	0.0036	0.0036	0.002	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (BCA) UCL
	mg/L	Downstream	17	1	94.1%	0.0099	0.037	0.037	0.026	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
Crow Creek	mg/L	Upstream	5	1	80.0%	0.00083	0.0012	0.0012	0.0012	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
	mg/L	Downstream	12	0	100.0%	0.0041	0.014	0.014	0.010	Assuming Normal Distribution	95% Student's-t UCL

TABLE 3-10
Surface Water EPC for ECOPCs by Drainage and Location Relative to Inputs

Drainage/Analyte	Units	Upstream/ Downstream	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
						Min	Max		EPC[2]	Dist.	Estimation Method
Zinc, Dissolved											
Smoky Creek	mg/L	Upstream	2	2	0.0%	NA	NA	0.0028	0.0028	No detected concentrations [1]	NA
	mg/L	Downstream	4	4	0.0%	NA	NA	0.0034	0.0034	No detected concentrations [1]	NA
Tygee Creek [3]	mg/L	Upstream	5	5	0.0%	NA	NA	0.0043	0.0043	No detected concentrations [1]	NA
	mg/L	Downstream	2	2	0.0%	NA	NA	0.0024	0.0024	No detected concentrations [1]	NA
Pole Canyon Creek	mg/L	Upstream	4	4	0.0%	NA	NA	0.003	0.003	No detected concentrations [1]	NA
	mg/L	Downstream	8	0	100.0%	0.734	1.63	1.63	1.27	Assuming Normal Distribution	95% Student's-t UCL
North Fork Sage Creek	mg/L	Upstream	8	8	0.0%	NA	NA	0.0041	0.0041	No detected concentrations [1]	NA
	mg/L	Downstream	4	3	25.0%	0.0013	0.0013	0.0013	0.0013	Only 1 detected concentration [1]	NA
Sage Creek	mg/L	Upstream	4	4	0.0%	NA	NA	0.0019	0.0019	No detected concentrations [1]	NA
	mg/L	Downstream	3	3	0.0%	NA	NA	0.0024	0.0024	No detected concentrations [1]	NA
Hoopes Spring	mg/L	NA	12	12	0.0%	NA	NA	0.0038	0.0038	No detected concentrations [1]	NA
South Fork Sage Creek	mg/L	Upstream	2	2	0.0%	NA	NA	0.0023	0.0023	No detected concentrations [1]	NA
	mg/L	Downstream	18	18	0.0%	NA	NA	0.0054	0.0054	No detected concentrations [1]	NA
Lower Sage Valley	mg/L	Upstream	6	6	0.0%	NA	NA	0.0023	0.0023	No detected concentrations [1]	NA
	mg/L	Downstream	14	12	14.3%	0.001	0.00538	0.0054	0.0054	Only 2 detected concentrations [1]	NA
Crow Creek	mg/L	Upstream	4	3	25.0%	0.0149	0.0149	0.015	0.015	Only 1 detected concentration [1]	NA
	mg/L	Downstream	8	8	0.0%	NA	NA	0.0029	0.0029	No detected concentrations [1]	NA

Notes:

COI - Chemical of Interest, ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, ERA - Ecological Risk Assessment, NA - Not Applicable, mg/L - milligram per liter, UCL - Upper Confidence Limit

1. Maximum detected concentration used for EPC value due to small sample size; In absence of detected concentrations, max non-detect values are used.
2. The calculated 95 UCL is greater than the maximum concentration, therefore the maximum concentration is selected as the EPC.
3. Tygee Creek Upstream includes Roberts Creek Drainage

TABLE 3-11
Brown Trout Tissues - Individual Site EPC for ECOPCs

Site Name	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC	Distribution	Estimation Method
Aluminum										
HS-3	mg/kg	13	0	100%	6.7	346.7	346.7	181.8	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
LSS	mg/kg	13	0	100%	18.9	109	109	65.0	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	11	0	100%	49.8	214	214	138.5	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	13	0	100%	6.2	76.5	76.5	45.6	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	14	0	100%	8.3	221	221	91.5	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	3	0	100%	9.4	85.1	85.1	85.1	Only 3 detected concentrations [1]	NA
CC-1A	mg/kg	10	0	100%	23.1	214	214	114.3	Assuming Normal Distribution	95% Student's-t UCL
Barium										
HS-3	mg/kg	13	0	100%	1.16	5.74	5.74	3.21	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	13	0	100%	0.913	2.9	2.9	1.76	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	11	0	100%	1.22	3.74	3.74	2.67	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	13	0	100%	0.83	2.1	2.1	1.68	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	14	0	100%	0.83	3.58	3.58	2.50	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	3	0	100%	1.094	2.21	2.21	2.21	Only 3 detected concentrations [1]	NA
CC-1A	mg/kg	10	0	100%	1.62	4.25	4.25	2.91	Assuming Normal Distribution	95% Student's-t UCL
Cadmium										
HS-3	mg/kg	13	0	100%	0.04	0.39	0.39	0.20	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	13	0	100%	0.23	0.71	0.71	0.48	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	11	0	100%	0.08	0.24	0.24	0.16	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	13	0	100%	0.04	0.19	0.19	0.12	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	14	0	100%	0.06	0.15	0.15	0.11	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	3	0	100%	0.05	0.10	0.10	0.10	Only 3 detected concentrations [1]	NA
CC-1A	mg/kg	10	0	100%	0.03	0.12	0.12	0.08	Assuming Normal Distribution	95% Student's-t UCL
Chromium										
HS-3	mg/kg	13	0	100%	0.17	14.86	14.86	7.95	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
LSS	mg/kg	13	0	100%	0.23	3.04	3.04	1.46	Assuming Gamma Distribution	95% Adjusted Gamma UCL
LSV-2C	mg/kg	11	0	100%	0.28	4.80	4.80	2.04	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	13	1	92%	0.10	1.23	1.23	0.51	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
LSV-4	mg/kg	14	1	93%	0.08	1.99	1.99	1.13	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (Chebyshev) UCL
CC-350	mg/kg	3	0	100%	0.37	1.37	1.37	1.37	Only 3 detected concentrations [1]	NA
CC-1A	mg/kg	10	0	100%	0.21	1.02	1.02	0.66	Assuming Normal Distribution	95% Student's-t UCL

TABLE 3-11
Brown Trout Tissues - Individual Site EPC for ECOPCs

Site Name	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC	Distribution	Estimation Method
Cobalt										
HS-3	mg/kg	13	0	100%	0.10	0.26	0.26	0.21	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	13	0	100%	0.06	0.24	0.24	0.16	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	11	0	100%	0.12	0.36	0.36	0.28	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	13	0	100%	0.06	0.35	0.35	0.20	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	14	0	100%	0.04	0.16	0.16	0.13	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	3	0	100%	0.08	0.13	0.13	0.13	Only 3 detected concentrations [1]	NA
CC-1A	mg/kg	10	0	100%	0.07	0.31	0.31	0.17	Assuming Normal Distribution	95% Student's-t UCL
Copper										
HS-3	mg/kg	13	0	100%	2.46	5.51	5.51	4.24	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	13	0	100%	2.75	7.50	7.50	5.40	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	11	0	100%	2.64	9.83	9.83	5.59	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	13	0	100%	2.38	12.18	12.18	5.79	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	14	0	100%	2.45	16.20	16.20	10.78	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
CC-350	mg/kg	3	0	100%	2.61	11.04	11.04	11.04	Only 3 detected concentrations [1]	NA
CC-1A	mg/kg	10	0	100%	2.22	3.79	3.79	2.88	Assuming Normal Distribution	95% Student's-t UCL
Iron										
HS-3	mg/kg	13	0	100%	47.0	184.0	184.0	102.8	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	13	0	100%	41.0	114.0	114.0	93.0	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	11	0	100%	80.0	245.0	245.0	172.4	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	13	0	100%	45.0	97.0	97.0	78.0	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	14	0	100%	54.0	217.0	217.0	135.2	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	3	0	100%	49.0	102.0	102.0	102.0	Only 3 detected concentrations [1]	NA
CC-1A	mg/kg	10	0	100%	54.0	185.0	185.0	118.6	Assuming Normal Distribution	95% Student's-t UCL
Manganese										
HS-3	mg/kg	13	0	100%	3.14	17.5	17.5	9.321	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	13	0	100%	4.27	13.2	13.2	10.65	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	11	0	100%	11.85	50.4	50.4	38.15	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	13	0	100%	9.68	20.8	20.8	17.47	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	14	0	100%	5.58	23.3	23.3	16.88	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	3	0	100%	5.81	15.99	15.99	15.99	Only 3 detected concentrations [1]	NA
CC-1A	mg/kg	10	0	100%	9.02	25.0	25.0	18.97	Assuming Normal Distribution	95% Student's-t UCL

TABLE 3-11
Brown Trout Tissues - Individual Site EPC for ECOPCs

Site Name	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC	Distribution	Estimation Method
Nickel										
HS-3	mg/kg	13	0	100%	0.26	2.17	2.17	1.32	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
LSS	mg/kg	13	0	100%	0.29	1.05	1.05	0.64	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	11	0	100%	0.28	1.9	1.9	1.23	Assuming Gamma Distribution	95% Adjusted Gamma UCL
LSV-3	mg/kg	13	0	100%	0.23	0.8	0.8	0.45	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	14	0	100%	0.24	1.22	1.22	0.59	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	3	0	100%	0.28	0.8	0.8	0.80	Only 3 detected concentrations [1]	NA
CC-1A	mg/kg	10	0	100%	0.25	0.66	0.66	0.51	Assuming Normal Distribution	95% Student's-t UCL
Selenium										
HS-3	mg/kg	13	0	100%	11.9	25.2	25.2	21.4	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	13	0	100%	8.53	17.5	17.5	14.0	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	11	0	100%	13.6	21.2	21.2	18.6	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	13	0	100%	10.0	16.0	16.0	14.5	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	14	0	100%	12.8	28.3	28.3	21.8	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	3	0	100%	7.64	8.29	8.29	8.3	Only 3 detected concentrations [1]	NA
CC-1A	mg/kg	10	0	100%	11.6	16.8	16.8	15.4	Assuming Normal Distribution	95% Student's-t UCL
Vanadium										
HS-3	mg/kg	13	0	100%	0.1	2.79	2.79	1.0	Assuming Lognormal Distribution	95% H-UCL
LSS	mg/kg	13	0	100%	0.18	0.6	0.6	0.4	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	11	0	100%	0.24	0.63	0.63	0.5	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	13	0	100%	0.09	0.46	0.46	0.3	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	14	0	100%	0.13	0.69	0.69	0.4	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	3	0	100%	0.18	0.27	0.27	0.3	Only 3 detected concentrations [1]	NA
CC-1A	mg/kg	10	0	100%	0.21	0.67	0.67	0.4	Assuming Normal Distribution	95% Student's-t UCL
Zinc										
HS-3	mg/kg	13	0	100%	115.5	186	186	166.5	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	13	0	100%	101.4	205	205	160	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	11	0	100%	124.1	181	181	158.6	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	13	0	100%	117.4	189	189	169.5	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	14	0	100%	88.6	214	214	158.8	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	3	0	100%	106.8	232	232	232	Only 3 detected concentrations [1]	NA
CC-1A	mg/kg	10	0	100%	149	205	205	186.1	Assuming Normal Distribution	95% Student's-t UCL

Notes:
COI - Chemical of Interest, ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, ERA - Ecological Risk Assessment, NA - Not Available, mg/kg - milligram per kilogram, UCL - Upper Confidence Limit
1. Maximum detected concentration used for EPC value due to small sample size; In absence of detected concentrations, max non-detect values are used.

TABLE 3-12
Yellowstone Cutthroat Trout Tissues - Individual Site EPC for ECOPCs

Site Name	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations Min	Detected Concentrations Max	ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method: EPC	Distribution	Estimation Method
Aluminum										
LSm	mg/kg	2	0	100%	196.4	407.7	407.7	407.7	Only 2 detected concentrations [1]	NA
LT-5	mg/kg	7	0	100%	83.5	188.0	188.0	167.2	Assuming Normal Distribution	95% Student's-t UCL
US-4	mg/kg	8	0	100%	4.0	315.0	315.0	175.0	Assuming Normal Distribution	95% Student's-t UCL
LS	mg/kg	13	0	100%	24.2	477.0	477.0	217.5	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	1	0	100%	18.9	18.9	18.9	18.9	Only 1 detected concentrations [1]	NA
LSV-2C	mg/kg	2	0	100%	17.9	75.9	75.9	75.9	Only 2 detected concentrations [1]	NA
LSV-4	mg/kg	5	0	100%	9.8	20.9	20.9	19.4	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100%	14.9	175.0	175.0	93.5	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	3	0	100%	14.2	20.6	20.6	20.6	Only 3 detected concentrations [1]	NA
US	mg/kg	12	0	100%	12.0	243.0	243.0	109.0	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Barium										
LSm	mg/kg	2	0	100%	3.5	4.4	4.4	4.4	Only 2 detected concentrations [1]	NA
LT-5	mg/kg	7	0	100%	2.1	4.9	4.9	4.7	Assuming Normal Distribution	95% Student's-t UCL
US-4	mg/kg	7	0	100%	1.0	3.3	3.3	2.5	Assuming Normal Distribution	95% Student's-t UCL
LS	mg/kg	13	0	100%	1.4	3.8	3.8	2.3	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	1	0	100%	1.5	1.5	1.5	1.5	Only 1 detected concentrations [1]	NA
LSV-2C	mg/kg	2	0	100%	0.9	3.8	3.8	3.8	Only 2 detected concentrations [1]	NA
LSV-4	mg/kg	5	0	100%	1.3	2.3	2.3	2.2	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100%	1.7	5.8	5.8	3.4	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	3	0	100%	0.9	1.1	1.1	1.1	Only 3 detected concentrations [1]	NA
US	mg/kg	12	0	100%	0.8	2.8	2.8	1.7	Assuming Normal Distribution	95% Student's-t UCL
Cadmium										
LSm	mg/kg	2	0	100%	0.9	2.0	2.0	2.0	Only 2 detected concentrations [1]	NA
LT-5	mg/kg	7	0	100%	0.1	0.8	0.8	0.5	Assuming Normal Distribution	95% Student's-t UCL
US-4	mg/kg	8	0	100%	0.1	0.9	0.9	0.5	Assuming Normal Distribution	95% Student's-t UCL
LS	mg/kg	13	0	100%	0.2	0.9	0.9	0.5	Assuming Gamma Distribution	95% Adjusted Gamma UCL
HS-3	mg/kg	1	0	100%	0.2	0.2	0.2	0.2	Only 1 detected concentrations [1]	NA
LSV-2C	mg/kg	2	0	100%	0.1	0.2	0.2	0.2	Only 2 detected concentrations [1]	NA
LSV-4	mg/kg	5	0	100%	0.0	0.1	0.1	0.1	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100%	0.1	0.5	0.5	0.2	Assuming Gamma Distribution	95% Adjusted Gamma UCL
CC-1A	mg/kg	3	0	100%	0.0	0.1	0.1	0.1	Only 3 detected concentrations [1]	NA
US	mg/kg	12	0	100%	0.1	0.5	0.5	0.3	Assuming Normal Distribution	95% Student's-t UCL

TABLE 3-12
Yellowstone Cutthroat Trout Tissues - Individual Site EPC for ECOPCs

Site Name	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations Min	Detected Concentrations Max	ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method: EPC	Distribution	Estimation Method
Chromium										
LSm	mg/kg	2	0	100%	0.7	1.4	1.4	1.4	Only 2 detected concentrations [1]	NA
LT-5	mg/kg	7	0	100%	0.4	0.8	0.8	0.6	Assuming Normal Distribution	95% Student's-t UCL
US-4	mg/kg	8	1	88%	0.4	1.8	1.8	1.2	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
LS	mg/kg	13	0	100%	0.4	3.0	3.0	1.4	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	1	0	100%	0.3	0.3	0.3	0.3	Only 1 detected concentrations [1]	NA
LSV-2C	mg/kg	2	0	100%	0.3	0.9	0.9	0.9	Only 2 detected concentrations [1]	NA
LSV-4	mg/kg	5	0	100%	0.4	1.4	1.4	1.1	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100%	0.1	1.8	1.8	0.8	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	3	0	100%	0.1	0.5	0.5	0.5	Only 3 detected concentrations [1]	NA
US	mg/kg	12	0	100%	0.1	1.9	1.9	1.1	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Cobalt										
LSm	mg/kg	2	0	100%	0.2	0.4	0.4	0.4	Only 2 detected concentrations [1]	NA
LT-5	mg/kg	7	0	100%	0.1	0.2	0.2	0.2	Assuming Normal Distribution	95% Student's-t UCL
US-4	mg/kg	8	0	100%	0.1	0.3	0.3	0.3	Assuming Normal Distribution	95% Student's-t UCL
LS	mg/kg	13	0	100%	0.1	0.3	0.3	0.2	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	1	0	100%	0.3	0.3	0.3	0.3	Only 1 detected concentrations [1]	NA
LSV-2C	mg/kg	2	0	100%	0.1	0.3	0.3	0.3	Only 2 detected concentrations [1]	NA
LSV-4	mg/kg	5	0	100%	0.1	0.2	0.2	0.1	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100%	0.1	0.2	0.2	0.1	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	3	0	100%	0.0	0.1	0.1	0.1	Only 3 detected concentrations [1]	NA
US	mg/kg	12	0	100%	0.1	0.5	0.5	0.3	Assuming Normal Distribution	95% Student's-t UCL
Copper										
LSm	mg/kg	2	0	100%	4.4	4.4	4.4	4.4	Only 2 detected concentrations [1]	NA
LT-5	mg/kg	7	0	100%	2.9	4.9	4.9	4.1	Assuming Normal Distribution	95% Student's-t UCL
US-4	mg/kg	8	0	100%	3.4	8.5	8.5	7.0	Assuming Normal Distribution	95% Student's-t UCL
LS	mg/kg	13	0	100%	2.6	24.3	24.3	13.5	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
HS-3	mg/kg	1	0	100%	5.1	5.1	5.1	5.1	Only 1 detected concentrations [1]	NA
LSV-2C	mg/kg	2	0	100%	2.3	3.8	3.8	3.8	Only 2 detected concentrations [1]	NA
LSV-4	mg/kg	5	0	100%	4.7	11.7	11.7	11.1	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100%	2.7	7.1	7.1	5.4	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	3	0	100%	2.8	3.7	3.7	3.7	Only 3 detected concentrations [1]	NA
US	mg/kg	12	0	100%	3.3	6.9	6.9	5.4	Assuming Normal Distribution	95% Student's-t UCL

TABLE 3-12
Yellowstone Cutthroat Trout Tissues - Individual Site EPC for ECOPCs

Site Name	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations Min	Detected Concentrations Max	ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method: EPC	Distribution	Estimation Method
Iron										
LSm	mg/kg	2	0	100%	184.0	322.0	322.0	322.0	Only 2 detected concentrations [1]	NA
LT-5	mg/kg	7	0	100%	99.0	173.0	173.0	156.3	Assuming Normal Distribution	95% Student's-t UCL
US-4	mg/kg	8	0	100%	52.0	294.0	294.0	184.1	Assuming Normal Distribution	95% Student's-t UCL
LS	mg/kg	13	0	100%	89.0	356.0	356.0	191.4	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	1	0	100%	81.0	81.0	81.0	81.0	Only 1 detected concentrations [1]	NA
LSV-2C	mg/kg	2	0	100%	48.0	120.0	120.0	120.0	Only 2 detected concentrations [1]	NA
LSV-4	mg/kg	5	0	100%	56.0	86.0	86.0	81.3	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100%	61.0	159.0	159.0	109.1	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	3	0	100%	46.0	49.0	49.0	49.0	Only 3 detected concentrations [1]	NA
US	mg/kg	12	0	100%	58.0	270.0	270.0	144.9	Assuming Gamma Distribution	95% Adjusted Gamma UCL
Manganese										
LSm	mg/kg	2	0	100%	19.1	23.8	23.8	23.8	Only 2 detected concentrations [1]	NA
LT-5	mg/kg	7	0	100%	15.7	31.7	31.7	26.5	Assuming Normal Distribution	95% Student's-t UCL
US-4	mg/kg	8	0	100%	4.1	23.9	23.9	16.3	Assuming Normal Distribution	95% Student's-t UCL
LS	mg/kg	13	0	100%	9.6	29.2	29.2	19.6	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	1	0	100%	4.9	4.9	4.9	4.9	Only 1 detected concentrations [1]	NA
LSV-2C	mg/kg	2	0	100%	4.5	35.8	35.8	35.8	Only 2 detected concentrations [1]	NA
LSV-4	mg/kg	5	0	100%	7.7	12.2	12.2	11.6	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100%	6.8	11.1	11.1	10.2	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	3	0	100%	6.2	7.3	7.3	7.3	Only 3 detected concentrations [1]	NA
US	mg/kg	12	0	100%	4.2	19.4	19.4	10.5	Assuming Normal Distribution	95% Student's-t UCL
Nickel										
LSm	mg/kg	2	0	100%	0.5	0.7	0.7	0.7	Only 2 detected concentrations [1]	NA
LT-5	mg/kg	7	0	100%	0.2	3.6	3.6	2.9	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
US-4	mg/kg	8	1	88%	0.4	1.1	1.1	0.8	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL
LS	mg/kg	13	0	100%	0.3	1.8	1.8	0.9	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	1	0	100%	0.5	0.5	0.5	0.5	Only 1 detected concentrations [1]	NA
LSV-2C	mg/kg	2	0	100%	0.3	0.5	0.5	0.5	Only 2 detected concentrations [1]	NA
LSV-4	mg/kg	5	0	100%	0.4	0.8	0.8	0.7	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100%	0.2	0.6	0.6	0.4	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	3	0	100%	0.2	0.3	0.3	0.3	Only 3 detected concentrations [1]	NA
US	mg/kg	12	3	75%	0.3	1.0	1.0	0.5	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (t) UCL

TABLE 3-12
Yellowstone Cutthroat Trout Tissues - Individual Site EPC for ECOPCs

Site Name	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC	Distribution	Estimation Method
Selenium										
LSm	mg/kg	2	0	100%	4.2	5.3	5.3	5.3	Only 2 detected concentrations [1]	NA
LT-5	mg/kg	7	0	100%	2.4	8.3	8.3	6.2	Assuming Normal Distribution	95% Student's-t UCL
US-4	mg/kg	8	0	100%	2.8	5.6	5.6	4.8	Assuming Normal Distribution	95% Student's-t UCL
LS	mg/kg	13	0	100%	2.3	5.1	5.1	4.2	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	1	0	100%	23.2	23.2	23.2	23.2	Only 1 detected concentrations [1]	NA
LSV-2C	mg/kg	2	0	100%	2.3	17.4	17.4	17.4	Only 2 detected concentrations [1]	NA
LSV-4	mg/kg	5	0	100%	14.3	20.4	20.4	20.1	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100%	5.6	9.2	9.2	7.8	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	3	0	100%	8.6	11.0	11.0	11.0	Only 3 detected concentrations [1]	NA
US	mg/kg	12	0	100%	2.5	9.6	9.6	4.8	Assuming Normal Distribution	95% Student's-t UCL
Vanadium										
LSm	mg/kg	2	0	100%	0.6	1.1	1.1	1.1	Only 2 detected concentrations [1]	NA
LT-5	mg/kg	7	0	100%	0.3	0.5	0.5	0.5	Assuming Normal Distribution	95% Student's-t UCL
US-4	mg/kg	8	0	100%	0.1	0.7	0.7	0.4	Assuming Normal Distribution	95% Student's-t UCL
LS	mg/kg	13	0	100%	0.2	1.0	1.0	0.5	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	1	0	100%	0.2	0.2	0.2	0.2	Only 1 detected concentrations [1]	NA
LSV-2C	mg/kg	2	0	100%	0.1	0.4	0.4	0.4	Only 2 detected concentrations [1]	NA
LSV-4	mg/kg	5	0	100%	0.1	0.2	0.2	0.2	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100%	0.1	0.5	0.5	0.3	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	3	0	100%	0.2	0.2	0.2	0.2	Only 3 detected concentrations [1]	NA
US	mg/kg	12	0	100%	0.1	0.5	0.5	0.3	Assuming Normal Distribution	95% Student's-t UCL
Zinc										
LSm	mg/kg	2	0	100%	85.8	101.1	101.1	101.1	Only 2 detected concentrations [1]	NA
LT-5	mg/kg	7	0	100%	70.2	98.2	98.2	92.3	Assuming Normal Distribution	95% Student's-t UCL
US-4	mg/kg	8	0	100%	63.9	100.0	100.0	92.7	Assuming Normal Distribution	95% Student's-t UCL
LS	mg/kg	13	0	100%	62.8	89.3	89.3	81.9	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	1	0	100%	118.0	118.0	118.0	118.0	Only 1 detected concentrations [1]	NA
LSV-2C	mg/kg	2	0	100%	74.8	119.0	119.0	119.0	Only 2 detected concentrations [1]	NA
LSV-4	mg/kg	5	0	100%	76.0	105.0	105.0	99.7	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100%	81.9	134.0	134.0	117.6	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	3	0	100%	67.4	76.9	76.9	76.9	Only 3 detected concentrations [1]	NA
US	mg/kg	12	0	100%	62.2	99.1	99.1	84.9	Assuming Normal Distribution	95% Student's-t UCL

Notes:

COI - Chemical of Interest, ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, ERA - Ecological Risk Assessment, NA - Not Available, mg/kg - milligram per kilogram, UCL - Upper Confidence Limit

1. Maximum detected concentration used for EPC value due to small sample size; In absence of detected concentrations, max non-detect values are used.

TABLE 3-13
Sculpin Tissues - Individual Site EPC for ECOPCs

Site Name	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC[2]	Distribution	Estimation Method
Aluminum										
LT-5	mg/kg	10	0	100.0%	187.0	716.0	716.0	410.3	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	10	0	100.0%	17.1	55.3	55.3	38.4	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	4	0	100.0%	54.7	125.0	125.0	119.7	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	10	0	100.0%	40.3	285.0	285.0	151.8	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	10	0	100.0%	37.4	186.0	186.0	110.0	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	11	0	100.0%	12.9	181.0	181.0	91.0	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100.0%	24.8	272.0	272.0	190.1	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	10	0	100.0%	22.8	330.0	330.0	258.0	Assuming Normal Distribution	95% Student's-t UCL
Barium										
LT-5	mg/kg	10	0	100.0%	8.6	15.0	15.0	11.7	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	10	0	100.0%	3.1	4.9	4.9	4.2	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	4	0	100.0%	3.9	6.3	6.3	6.2	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	10	0	100.0%	3.6	6.1	6.1	5.2	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	10	0	100.0%	3.3	6.5	6.5	5.0	Assuming Gamma Distribution	95% Adjusted Gamma UCL
LSV-4	mg/kg	11	0	100.0%	3.8	6.1	6.1	5.6	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100.0%	6.5	9.2	9.2	7.6	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	10	0	100.0%	5.0	11.8	11.8	9.3	Assuming Normal Distribution	95% Student's-t UCL
Cadmium										
LT-5	mg/kg	10	0	100.0%	0.1	1.0	1.0	0.7	Nonparametric Distribution Free UCLs	95% Chebyshev (Mean, Sd) UCL
HS-3	mg/kg	10	0	100.0%	0.0	0.1	0.1	0.1	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	4	0	100.0%	0.2	0.4	0.4	0.3	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	10	0	100.0%	0.0	0.3	0.3	0.2	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	10	0	100.0%	0.1	0.1	0.1	0.1	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	11	0	100.0%	0.0	0.1	0.1	0.1	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100.0%	0.1	0.2	0.2	0.2	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	10	0	100.0%	0.0	0.2	0.2	0.1	Assuming Normal Distribution	95% Student's-t UCL
Chromium										
LT-5	mg/kg	10	0	100.0%	0.8	2.2	2.2	1.5	Assuming Gamma Distribution	95% Adjusted Gamma UCL
HS-3	mg/kg	10	0	100.0%	0.2	0.7	0.7	0.6	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	4	0	100.0%	0.4	0.7	0.7	0.7	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	10	0	100.0%	0.2	1.2	1.2	0.7	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	10	0	100.0%	0.2	0.7	0.7	0.5	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	11	1	90.9%	0.1	1.5	1.5	0.9	Kaplan-Meier (KM) Statistics (Normal Critical Values) and Nonparametric UCLs	95% KM (Chebyshev) UCL
CC-350	mg/kg	10	0	100.0%	0.3	2.6	2.6	1.3	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	10	0	100.0%	0.4	1.4	1.4	1.0	Assuming Normal Distribution	95% Student's-t UCL

TABLE 3-13
Sculpin Tissues - Individual Site EPC for ECOPCs

Site Name	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC[2]	Distribution	Estimation Method
Cobalt										
LT-5	mg/kg	10	0	100.0%	0.1	0.3	0.3	0.2	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	10	0	100.0%	0.1	0.2	0.2	0.2	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	4	0	100.0%	0.1	0.2	0.2	0.2	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	10	0	100.0%	0.1	0.4	0.4	0.3	Assuming Gamma Distribution	95% Adjusted Gamma UCL
LSV-3	mg/kg	10	0	100.0%	0.1	0.2	0.2	0.2	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	11	0	100.0%	0.1	0.2	0.2	0.1	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100.0%	0.1	0.2	0.2	0.2	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	10	0	100.0%	0.1	0.2	0.2	0.2	Assuming Normal Distribution	95% Student's-t UCL
Copper										
LT-5	mg/kg	10	0	100.0%	2.3	4.5	4.5	3.7	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	10	0	100.0%	1.9	2.6	2.6	2.4	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	4	0	100.0%	2.4	2.8	2.8	2.7	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	10	0	100.0%	2.2	3.7	3.7	3.1	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	10	0	100.0%	2.2	3.2	3.2	3.0	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	11	0	100.0%	2.6	3.5	3.5	3.1	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100.0%	2.2	3.2	3.2	2.9	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	10	0	100.0%	1.9	2.9	2.9	2.7	Assuming Normal Distribution	95% Student's-t UCL
Iron										
LT-5	mg/kg	10	0	100.0%	167.0	488.0	488.0	309.8	Assuming Gamma Distribution	95% Adjusted Gamma UCL
HS-3	mg/kg	10	0	100.0%	48.0	89.0	89.0	74.9	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	4	0	100.0%	83.0	120.0	120.0	115.9	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	10	0	100.0%	70.0	276.0	276.0	166.2	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	10	0	100.0%	70.0	178.0	178.0	120.3	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	11	0	100.0%	57.0	194.0	194.0	122.1	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100.0%	64.0	241.0	241.0	179.6	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	10	0	100.0%	54.0	256.0	256.0	215.0	Assuming Normal Distribution	95% Student's-t UCL
Manganese										
LT-5	mg/kg	10	0	100.0%	20.1	59.0	59.0	37.6	Assuming Gamma Distribution	95% Adjusted Gamma UCL
HS-3	mg/kg	10	0	100.0%	4.2	23.1	23.1	12.3	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	4	0	100.0%	10.3	13.5	13.5	13.5	Assuming Normal Distribution [2]	95% Student's-t UCL
LSV-2C	mg/kg	10	0	100.0%	16.6	48.5	48.5	34.6	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	10	0	100.0%	15.5	23.3	23.3	21.0	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	11	0	100.0%	8.7	25.5	25.5	20.0	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100.0%	11.1	24.5	24.5	18.5	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	10	0	100.0%	12.4	31.5	31.5	25.3	Assuming Normal Distribution	95% Student's-t UCL

TABLE 3-13
Sculpin Tissues - Individual Site EPC for ECOPCs

Site Name	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
					Min	Max		EPC[2]	Distribution	Estimation Method
Nickel										
LT-5	mg/kg	10	0	100.0%	0.5	0.9	0.9	0.7	Assuming Gamma Distribution	95% Adjusted Gamma UCL
HS-3	mg/kg	10	0	100.0%	0.4	0.7	0.7	0.6	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	4	0	100.0%	0.5	0.6	0.6	0.6	Assuming Normal Distribution [2]	95% Student's-t UCL
LSV-2C	mg/kg	10	0	100.0%	0.4	0.7	0.7	0.6	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	10	0	100.0%	0.4	0.7	0.7	0.5	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	11	0	100.0%	0.4	0.6	0.6	0.6	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100.0%	0.5	1.0	1.0	0.8	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	10	0	100.0%	0.5	0.8	0.8	0.7	Assuming Normal Distribution	95% Student's-t UCL
Selenium										
LT-5	mg/kg	10	0	100.0%	3.4	5.4	5.4	4.8	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	10	0	100.0%	14.4	20.3	20.3	18.4	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	4	0	100.0%	13.5	17.9	17.9	17.8	Assuming Normal Distribution	95% Student's-t UCL
LSV-2C	mg/kg	10	0	100.0%	13.3	26.9	26.9	21.4	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	10	0	100.0%	10.9	35.7	35.7	21.6	Assuming Gamma Distribution	95% Adjusted Gamma UCL
LSV-4	mg/kg	11	0	100.0%	14.8	28.0	28.0	22.6	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100.0%	3.2	10.5	10.5	8.9	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	10	0	100.0%	10.3	16.2	16.2	14.7	Assuming Normal Distribution	95% Student's-t UCL
Vanadium										
LT-5	mg/kg	10	0	100.0%	1.3	2.2	2.2	1.8	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	10	0	100.0%	0.4	0.8	0.8	0.6	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	4	0	100.0%	0.7	1.0	1.0	1.0	Assuming Normal Distribution [2]	95% Student's-t UCL
LSV-2C	mg/kg	10	0	100.0%	0.9	1.7	1.7	1.3	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	10	0	100.0%	0.8	1.3	1.3	1.1	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	11	0	100.0%	0.7	1.8	1.8	1.4	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100.0%	1.3	2.3	2.3	1.8	Assuming Normal Distribution	95% Student's-t UCL
CC-1A	mg/kg	10	0	100.0%	1.0	1.8	1.8	1.7	Assuming Normal Distribution	95% Student's-t UCL
Zinc										
LT-5	mg/kg	10	0	100.0%	58.3	113.0	113.0	85.4	Assuming Normal Distribution	95% Student's-t UCL
HS-3	mg/kg	10	0	100.0%	53.9	74.8	74.8	66.1	Assuming Normal Distribution	95% Student's-t UCL
LSS	mg/kg	4	0	100.0%	58.4	68.8	68.8	68.8	Assuming Normal Distribution [2]	95% Student's-t UCL
LSV-2C	mg/kg	10	0	100.0%	48.7	66.6	66.6	62.6	Assuming Normal Distribution	95% Student's-t UCL
LSV-3	mg/kg	10	0	100.0%	47.8	65.6	65.6	60.9	Assuming Normal Distribution	95% Student's-t UCL
LSV-4	mg/kg	11	0	100.0%	42.2	87.1	87.1	70.7	Assuming Normal Distribution	95% Student's-t UCL
CC-350	mg/kg	10	0	100.0%	49.9	109.0	109.0	84.5	Assuming Gamma Distribution	95% Adjusted Gamma UCL
CC-1A	mg/kg	10	0	100.0%	57.1	101.0	101.0	81.2	Assuming Normal Distribution	95% Student's-t UCL

Notes:

COI - Chemical of Interest, ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, ERA - Ecological Risk Assessment, NA - Not Available, mg/kg - milligram per kilogram, UCL - Upper Confidence Limit

1. Maximum detected concentration used for EPC value due to small sample size; In absence of detected concentrations, max non-detect values are used.

2. The calculated 95 UCL is greater than the maximum concentration, therefore the maximum concentration is selected as the EPC

TABLE 3-14
Benthic Invertebrate Tissues - Individual Site EPC for Selenium

Drainage Group	Site Name	Units	Number of Samples	Number of Non-Detects	Detection Frequency	Detected Concentrations		ECOPC Conc. Max[1]	EPC Concentration, Distribution, and Method		
						Min	Max		EPC[2]	Distribution	Estimation Method
Selenium											
CrowCreek	CC-75	mg/kg	2	0	100.0%	3.38	3.61	3.61	3.61	Max	insufficient data
CrowCreek	CC-150	mg/kg	2	0	100.0%	5.61	6.46	6.46	6.46	Max	insufficient data
CrowCreek	CC-350	mg/kg	2	0	100.0%	2.93	4.24	4.24	4.24	Max	insufficient data
CrowCreek	CC-1A	mg/kg	2	0	100.0%	8.87	16.7	16.7	16.7	Max	insufficient data
HoopesSpring	HS-3	mg/kg	1	0	100.0%	24.9	24.9	24.9	24.9	Max	insufficient data
LowerSageValley	LSV-2c	mg/kg	2	0	100.0%	12.7	53.4	53.4	53.4	Max	insufficient data
LowerSageValley	LSV-3	mg/kg	1	0	100.0%	64.6	64.6	64.6	64.6	Max	insufficient data
LowerSageValley	LSV-4	mg/kg	2	0	100.0%	17.6	24.1	24.1	24.1	Max	insufficient data
NorthForkSageCreek	NSV-6	mg/kg	1	0	100.0%	11.9	11.9	11.9	11.9	Max	insufficient data
PoleCanyonCreek	LP-PD	mg/kg	1	0	100.0%	16.9	16.9	16.9	16.9	Max	insufficient data
RobertsCreek	UR-3	mg/kg	1	0	100.0%	1.53	1.53	1.53	1.53	Max	insufficient data
Sage Creek	US-4	mg/kg	1	0	100.0%	3.46	3.46	3.46	3.46	Max	insufficient data
Sage Creek	US	mg/kg	1	0	100.0%	4.39	4.39	4.39	4.39	Max	insufficient data
Sage Creek	LS	mg/kg	1	0	100.0%	7.98	7.98	7.98	7.98	Max	insufficient data
SmokyCreek	Usm	mg/kg	1	0	100.0%	5.93	5.93	5.93	5.93	Max	insufficient data
SmokyCreek	Lsm	mg/kg	1	0	100.0%	3.11	3.11	3.11	3.11	Max	insufficient data
SouthForkSageCreek	LSS	mg/kg	2	0	100.0%	9.65	12.6	12.6	12.6	Max	insufficient data
TygeeCreek	LT-5	mg/kg	1	0	100.0%	3.69	3.69	3.69	3.69	Max	insufficient data

Notes:

ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, mg/kg - milligram per kilogram

TABLE 3-15
Tier 1 Site-Wide Assessment of Surface Water ECOPCs

ECOPC		Sitewide Aquatic Habitat UCL Concentrations (mg/L)	Surface Water Screening Benchmark for Aquatic Life (mg/L)	Sitewide Tier 2 ECOPC
CAS No.	Analyte[3]			
7429-90-5	Aluminum	0.9	0.087	***Yes***
7440-36-0	Antimony	0.00014	1.60	No
7440-38-2	Arsenic, Dissolved	0.011	0.15	No
7440-39-3	Barium	0.06	0.57	No
7440-41-7	Beryllium	0.000035	0.010	No
7440-42-8	Boron	0.022	7.2	No
7440-43-9	Cadmium, Dissolved	0.0072	0.00029	***Yes***
160-658-31	Chromium III, Dissolved[1]	0.0014	0.0903	No
184-540-299	Chromium VI, Dissolved[1]	0.0014	0.074	No
7440-48-4	Cobalt	0.00043	0.10	No
7440-50-8	Copper, Dissolved	0.00037	0.0139	No
7439-89-6	Iron	0.74	1	No
7439-92-1	Lead, Dissolved	0.000052	0.0033	No
7439-96-5	Manganese, Dissolved	0.14	1.79	No
7439-97-6	Mercury, Dissolved[2]	0.000072	0.00077	No
7439-98-7	Molybdenum	0.035	3.20	No
7440-02-0	Nickel, Dissolved	0.094	0.0637	***Yes***
7782-49-2	Selenium	1.09	0.005	***Yes***
7440-22-4	Silver, Dissolved	0.000033	0.0052	No
7440-28-0	Thallium	0.00004	0.0072	No
7440-61-1	Uranium, Dissolved	0.0089	1.96	No
7440-62-2	Vanadium	0.0027	0.027	No
7440-66-6	Zinc, Dissolved	0.17	0.14	***Yes***

Notes:

ECOPC - Ecological Chemical of Potential Concern, mg/L - milligram per liter, UCL - Upper Confidence Limit

[1] - Maximum detected concentrations of total chromium used due to small sample size for speciated chromium.

[2] - Mercury was not detected. The maximum detection limit was used for screening purposes.

[3]- Unless stated, concentrations are for total metal.

Criteria Sources:

[1]U.S. Environmental Protection Agency (EPA). 2009. National Recommended Water Quality Criteria (NRWQC) for Priority Pollutants. EPA Office of Water, Office of Science and Technology (4304T). Available at http://www.epa.gov/waterscience/criteria/wqcriteria.html. Updated December 2, 2009.

[2]Idaho Administrative Procedures Act (IDAPA) 58.01.02 water quality standards - IDAPA Numeric Criteria For Toxic Substances For Waters Designated For Aquatic Life, Recreation, Or Domestic Water Supply Use (IDAPA 2010).

[3]U.S. Environmental Protection Agency (EPA). 1986. Quality Criteria for Water 1986 ("The Gold Book"). EPA 440/5-86-001. May 1, 1986.

[4]Michigan Department of Environmental Quality (MDEQ). 2009. Freshwater Chronic Values (FCV) from Rule 57 Water Quality Values based on Rule 323.1057 (Toxic Substances) of the Part 4. Water Quality Standards gives procedures for calculating water quality values to protect humans, wildlife and aquatic life. http://www.michigan.gov/deq/0,1607,7-135-3313_3686_3728-11383--,00.html. Updated December 11, 2009.

[5]Chapman, P.M., H. Bailey, and E. Canaria. 2000. Toxicity of Total Dissolved Solids Associated with Two Mine Effluents to Chironomid Larvae and Early Lifestages of Rainbow Trout. Environmental Toxicology and Chemistry: Vol. 19, No. 1, pp. 210–214.

[6]Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Commission (WQCC). 2007. Reg. Number 32. Classifications and Numeric Standards for the Arkansas River System, updated February 2009. Available at http://www.cdphe.state.co.us/regulations/wqccregs/100232arkansasriverbasinnew.pdf.

TABLE 3-16
Tier 2 Assessment of Surface Water ECOPC by Drainage

Drainage	Surface Water EPC (mg/L)	Surface Water Screening Benchmark for Aquatic Life Chronic (mg/L)	Surface Water Screening Benchmark for Aquatic Life Acute (mg/L)	$HQ_{chronic}$	HQ_{acute}	Tier 3 ECOPC
Aluminum, Total						
Smoky Creek	0.64	0.087	0.750	**7**	0.9	**Yes**
Roberts Creek	0.1	0.087	0.750	1	0.1	No
Tygee Creek	1.58	0.087	0.750	**18**	**2**	**Yes**
Pole Canyon Creek	0.17	0.087	0.750	**2**	0.2	**Yes**
North Fork Sage Creek and North Sage Valley	2.07	0.087	0.750	**24**	**3**	**Yes**
Sage Creek	1.04	0.087	0.750	**12**	**1**	**Yes**
Hoopes Spring	0.02	0.087	0.750	0.2	0.03	No
South Fork Sage Creek	1.78	0.087	0.750	**20**	**2**	**Yes**
Lower Sage Valley	0.52	0.087	0.750	**6.0**	0.7	**Yes**
Crow Creek	0.58	0.087	0.750	**6.7**	0.8	**Yes**
Arsenic, Dissolved						
Smoky Creek	0.00093	0.15	0.34	0.01	0.003	No
Roberts Creek	0.00067	0.15	0.34	0.004	0.002	No
Tygee Creek	0.0014	0.15	0.34	0.01	0.004	No
Pole Canyon Creek	0.25	0.15	0.34	**2**	0.7	**Yes**
North Fork Sage Creek and North Sage Valley	0.0012	0.15	0.34	0.01	0.004	No
Sage Creek	0.00061	0.15	0.34	0.004	0.002	No
Hoopes Spring	0.0028	0.15	0.34	0.02	0.01	No
South Fork Sage Creek	0.00093	0.15	0.34	0.01	0.003	No
Lower Sage Valley	0.0014	0.15	0.34	0.01	0.004	No
Crow Creek	0.0014	0.15	0.34	0.01	0.004	No
Cadmium, Dissolved						
Smoky Creek	0.000039	0.00065	0.00153	0.06	0.03	No
Roberts Creek	0.000053	0.00065	0.00153	0.08	0.03	No
Tygee Creek	0.00011	0.00065	0.00153	0.17	0.07	No
Pole Canyon Creek	0.022	0.00065	0.00153	**33**	**14**	**Yes**
North Fork Sage Creek and North Sage Valley	0.00002	0.00065	0.00153	0.03	0.01	No
Sage Creek	0.000036	0.00065	0.00153	0.05	0.02	No
Hoopes Spring	0.00012	0.00065	0.00153	0.2	0.08	No
South Fork Sage Creek	0.000078	0.00065	0.00153	0.1	0.05	No
Lower Sage Valley	0.00005	0.00065	0.00153	0.08	0.03	No
Crow Creek	0.000036	0.00065	0.00153	0.05	0.02	No
Iron, Total						
Smoky Creek	0.57	1	NA	0.6	NA	No
Roberts Creek	0.099	1	NA	0.1	NA	No
Tygee Creek	0.99	1	NA	1.0	NA	No
Pole Canyon Creek	0.46	1	NA	0.5	NA	No
North Fork Sage Creek and North Sage Valley	1.47	1	NA	**2.0**	NA	**Yes**
Sage Creek	0.8	1	NA	0.8	NA	No
Hoopes Spring	0.03	1	NA	0.03	NA	No
South Fork Sage Creek	1.35	1	NA	1	NA	No
Lower Sage Valley	0.45	1	NA	0.5	NA	No
Crow Creek	0.44	1	NA	0.4	NA	No

TABLE 3-16
Tier 2 Assessment of Surface Water ECOPC by Drainage

Drainage	Surface Water EPC (mg/L)	Surface Water Screening Benchmark for Aquatic Life Chronic (mg/L)	Surface Water Screening Benchmark for Aquatic Life Acute (mg/L)	$HQ_{chronic}$	HQ_{acute}	Tier 3 ECOPC
Nickel, Dissolved						
Smoky Creek	0.0031	0.0637	0.5739	0.05	0.01	No
Roberts Creek	0.0028	0.0637	0.5739	0.04	0.005	No
Tygee Creek	0.0038	0.0637	0.5739	0.06	0.01	No
Pole Canyon Creek	0.35	0.0637	0.5739	**6**	0.6	**Yes**
North Fork Sage Creek and North Sage Valley	0.0045	0.0637	0.5739	0.07	0.01	No
Sage Creek	0.0025	0.0637	0.5739	0.04	0.004	No
Hoopes Spring	0.0028	0.0637	0.5739	0.04	0.005	No
South Fork Sage Creek	0.0024	0.0637	0.5739	0.04	0.004	No
Lower Sage Valley	0.003	0.0637	0.5739	0.05	0.01	No
Crow Creek	0.0031	0.0637	0.5739	0.05	0.01	No
Selenium, Total						
Smoky Creek	0.0004	0.005	0.02	0.08	0.02	No
Roberts Creek	0.00023	0.005	0.02	0.05	0.01	No
Tygee Creek	0.00068	0.005	0.02	0.14	0.03	No
Pole Canyon Creek	3.4	0.005	0.02	**680**	**170**	**Yes**
North Fork Sage Creek and North Sage Valley	0.0077	0.005	0.02	**2**	0.4	**Yes**
Sage Creek	0.00091	0.005	0.02	0.2	0.05	No
Hoopes Spring	0.043	0.005	0.02	**9**	**2**	**Yes**
South Fork Sage Creek	0.011	0.005	0.02	**2**	0.6	**Yes**
Lower Sage Valley	0.018	0.005	0.02	**4**	0.9	**Yes**
Crow Creek	0.0084	0.005	0.02	**2**	0.4	**Yes**
Zinc, Dissolved						
Smoky Creek	0.0034	0.14	0.14	0.02	0.02	No
Roberts Creek	0.0026	0.14	0.14	0.02	0.02	No
Tygee Creek	0.0043	0.14	0.14	0.03	0.03	No
Pole Canyon Creek	1.026	0.14	0.14	**7**	**7**	**Yes**
North Fork Sage Creek and North Sage Valley	0.0013	0.14	0.14	0.01	0.01	No
Sage Creek	0.0024	0.14	0.14	0.02	0.02	No
Hoopes Spring	0.0038	0.14	0.14	0.03	0.03	No
South Fork Sage Creek	0.0054	0.14	0.14	0.04	0.04	No
Lower Sage Valley	0.0054	0.14	0.14	0.04	0.04	No
Crow Creek	0.015	0.14	0.14	0.1	0.1	No

Notes:

ECOPC - Ecological Chemical of Potential Concern, HQ - Hazard Quotient, mg/L - milligram per liter, NA - Not Available, EPC - Exposure Point Concentration

[1] - Maximum detected concentrations of total chromium used due to small sample size for speciated chromium.
detected concentrations of Cr (total) were greater.

[2] - Mercury was not detected. The maximum detection limit was used for screening purposes.

Bold = HQ > 1.0

TABLE 3-17
Tier 1 Site-Wide Assessment of Sediment ECOPCs

ECOPC		TRV_{low} (mg/kg dw)	Site-Wide ECOPC Riverine Sediments Only
Analyte	Aquatic Habitat Sediment EPC (mg/kg dw)		
Aluminum	14220	25,500	NO
Antimony	1.63	3	NO
Arsenic	8.11	9.8	**Yes**
Barium	134.2	20	**Yes**
Beryllium	0.84	---	Uncertain
Boron	18.5	---	Uncertain
Cadmium	20.05	1	**Yes**
Chromium	164.2	43	**Yes**
Cobalt	7.07	50	No
Copper	26.32	32	**Yes**
Iron	16755	20,000	**Yes***
Lead	11.17	36	No
Manganese	1619	460	**Yes**
Mercury	0.073	0.18	**Yes***
Molybdenum	3.80	---	Uncertain
Nickel	120.1	23	**Yes**
Selenium	20.58	2	**Yes**
Silver	1.85	1	**Yes**
Thallium	0.52	---	Uncertain
Uranium	20.65	100	No
Vanadium	99.46	---	Uncertain
Zinc	566.9	120	**Yes**

Notes:

ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, TRV - Toxicity Reference Value, mg/kg dw - milligram per kilogram dry weight, "---" = Not Available

* Although the sediment EPC is less than the screening benchmark, this ECOPC is carried forward to Tier 2 to evaluate it in individual drainages.

TRV_{low} = TEC or equivalent values

TABLE 3-18
Tier 2 Assessment of Sediment ECOPC by Drainage

Drainage Group	Sediment EPC (mg/kg dw)	TRV_{low} (mg/kg dw)	TRV_{high} (mg/kg dw)	HQ_{low}	HQ_{high}	Tier 3 ECOPC
Arsenic						
Smoky Creek	4.3	9.8	33.00	0.4	0.1	No
Roberts Creek	2.4	9.8	33.00	0.2	0.1	No
Tygee Creek	3.4	9.8	33.00	0.3	0.1	No
Pole Canyon Creek	18.1	9.8	33.00	**2**	0.5	Uncertain
North Fork Sage Creek	4.6	9.8	33.00	0.5	0.1	No
Sage Creek	7.9	9.8	33.00	0.8	0.2	No
Hoopes Spring	2.4	9.8	33.00	0.2	0.1	No
South Fork Sage Creek	4.3	9.8	33.00	0.4	0.1	No
Lower Sage Valley	3.3	9.8	33.00	0.3	0.1	No
Crow Creek	1.8	9.8	33.00	0.2	0.1	No
Barium						
Smoky Creek	136	20	60	**7**	**2**	**Yes**
Roberts Creek	59.9	20	60	**3**	1	Uncertain
Tygee Creek	171	20	60	**9**	**3**	**Yes**
Pole Canyon Creek	181	20	60	**9**	**3**	**Yes**
North Fork Sage Creek	198	20	60	**10**	**3**	**Yes**
Sage Creek	200	20	60	**10**	**3**	**Yes**
Hoopes Spring	52.2	20	60	**3**	1	Uncertain
South Fork Sage Creek	87.4	20	60	**4**	1	Uncertain
Lower Sage Valley	112	20	60	**6**	**2**	**Yes**
Crow Creek	83.7	20	60	**4**	1	Uncertain
Beryllium						
Smoky Creek	0.81	--	--	No TRV	No TRV	Uncertain
Roberts Creek	0.42	--	--	No TRV	No TRV	Uncertain
Tygee Creek	0.52	--	--	No TRV	No TRV	Uncertain
Pole Canyon Creek	1.1	--	--	No TRV	No TRV	Uncertain
North Fork Sage Creek	0.83	--	--	No TRV	No TRV	Uncertain
Sage Creek	1.46	--	--	No TRV	No TRV	Uncertain
Hoopes Spring	0.38	--	--	No TRV	No TRV	Uncertain
South Fork Sage Creek	0.65	--	--	No TRV	No TRV	Uncertain
Lower Sage Valley	0.67	--	--	No TRV	No TRV	Uncertain
Crow Creek	0.35	--	--	No TRV	No TRV	Uncertain
Boron						
Smoky Creek	12.9	--	235.5	--	0.1	No
Roberts Creek	12.3	--	235.5	--	0.1	No
Tygee Creek	11.3	--	235.5	--	0.0	No
Pole Canyon Creek	38.3	--	235.5	--	0.2	No
North Fork Sage Creek	10.8	--	235.5	--	0.05	No
Sage Creek	17.9	--	235.5	--	0.1	No
Hoopes Spring	8	--	235.5	--	0.03	No
South Fork Sage Creek	13.2	--	235.5	--	0.1	No
Lower Sage Valley	14	--	235.5	--	0.1	No
Crow Creek	9.8	--	235.5	--	0.04	No

TABLE 3-18
Tier 2 Assessment of Sediment ECOPC by Drainage

Drainage Group	Sediment EPC (mg/kg dw)	TRV_{low} (mg/kg dw)	TRV_{high} (mg/kg dw)	HQ_{low}	HQ_{high}	Tier 3 ECOPC
Cadmium						
Smoky Creek	3.7	1	5.00	**4**	0.7	Uncertain
Roberts Creek	4.8	1	5.00	**5**	1	Uncertain
Tygee Creek	2.3	1	5.00	**2**	0.5	Uncertain
Pole Canyon Creek	42.9	1	5.00	**43**	**9**	**Yes**
North Fork Sage Creek	3.1	1	5.00	**3**	0.6	Uncertain
Sage Creek	12.3	1	5.00	**12**	**2**	**Yes**
Hoopes Spring	5.8	1	5.00	**6**	1	Uncertain
South Fork Sage Creek	3.8	1	5.00	**4**	0.8	Uncertain
Lower Sage Valley	3.4	1	5.00	**3**	0.7	Uncertain
Crow Creek	1.6	1	5.00	**2**	0.3	Uncertain
Chromium						
Smoky Creek	35.2	43	111	0.8	0.3	No
Roberts Creek	50.9	43	111	1	0.5	No
Tygee Creek	21.2	43	111	0.5	0.2	No
Pole Canyon Creek	387	43	111	**9**	**3**	**Yes**
North Fork Sage Creek	30.6	43	111	0.7	0.3	No
Sage Creek	70.1	43	111	**2**	0.6	Uncertain
Hoopes Spring	50.3	43	111	1	0.5	No
South Fork Sage Creek	37.4	43	111	0.9	0.3	No
Lower Sage Valley	29.1	43	111	0.7	0.3	No
Crow Creek	22.1	43	111	0.5	0.2	No
Copper						
Smoky Creek	20.5	32	149	0.6	0.1	No
Roberts Creek	6.6	32	149	0.2	0.04	No
Tygee Creek	10.2	32	149	0.3	0.1	No
Pole Canyon Creek	65.4	32	149	**2**	0.4	Uncertain
North Fork Sage Creek	17.2	32	149	0.5	0.1	No
Sage Creek	30.6	32	149	1	0.2	No
Hoopes Spring	4.5	32	149	0.1	0.03	No
South Fork Sage Creek	10.4	32	149	0.3	0.1	No
Lower Sage Valley	12.1	32	149	0.4	0.1	No
Crow Creek	5.9	32	149	0.2	0.04	No
Iron						
Smoky Creek	22200	20000	40000	1	0.6	No
Roberts Creek	6220	20000	40000	0.3	0.2	No
Tygee Creek	11000	20000	40000	0.6	0.3	No
Pole Canyon Creek	20600	20000	40000	1	0.5	No
North Fork Sage Creek	23200	20000	40000	1	0.6	No
Sage Creek	24333	20000	40000	1	0.6	No
Hoopes Spring	1570	20000	40000	0.1	0.04	No
South Fork Sage Creek	11400	20000	40000	0.6	0.3	No
Lower Sage Valley	15000	20000	40000	0.8	0.4	No
Crow Creek	6820	20000	40000	0.3	0.2	No

TABLE 3-18
Tier 2 Assessment of Sediment ECOPC by Drainage

Drainage Group	Sediment EPC (mg/kg dw)	TRV_{low} (mg/kg dw)	TRV_{high} (mg/kg dw)	HQ_{low}	HQ_{high}	Tier 3 ECOPC
Manganese						
Smoky Creek	1490	460	1100	**3**	1	Uncertain
Roberts Creek	643	460	1100	1	0.6	No
Tygee Creek	976	460	1100	**2**	0.9	Uncertain
Pole Canyon Creek	1400	460	1100	**3**	1	Uncertain
North Fork Sage Creek	5720	460	1100	**12**	**5**	**Yes**
Sage Creek	1480	460	1100	**3**	1	Uncertain
Hoopes Spring	222	460	1100	0.5	0.2	No
South Fork Sage Creek	738	460	1100	**2**	0.7	Uncertain
Lower Sage Valley	1856	460	1100	**4**	**2**	**Yes**
Crow Creek	277	460	1100	0.6	0.3	No
Mercury						
Smoky Creek	0.04	0.18	1.06	0.2	0.04	No
Roberts Creek	0.03	0.18	1.06	0.2	0.03	No
Tygee Creek	0.023	0.18	1.06	0.1	0.02	No
Pole Canyon Creek	0.26	0.18	1.06	1	0.2	No
North Fork Sage Creek	0.067	0.18	1.06	0.4	0.1	No
Sage Creek	0.057	0.18	1.06	0.3	0.1	No
HoopesSpring	0.023	0.18	1.06	0.1	0.02	No
South Fork Sage Creek	0.025	0.18	1.06	0.1	0.02	No
Lower Sage Valley	0.03	0.18	1.06	0.2	0.03	No
Crow Creek	0.02	0.18	1.06	0.1	0.02	No
Molybdenum						
Smoky Creek	0.39	--	3742	--	0.0001	No
Roberts Creek	0.79	--	3742	--	0.0002	No
Tygee Creek	0.44	--	3742	--	0.0001	No
Pole Canyon Creek	16	--	3742	--	0.004	No
North Fork Sage Creek	0.43	--	3742	--	0.0001	No
Sage Creek	2.3	--	3742	--	0.001	No
Hoopes Spring	0.55	--	3742	--	0.0001	No
South Fork Sage Creek	0.77	--	3742	--	0.0002	No
Lower Sage Valley	0.52	--	3742	--	0.0001	No
Crow Creek	0.38	--	3742	--	0.0001	No
Nickel						
Smoky Creek	23.2	23	48.6	1	0.5	No
Roberts Creek	9.9	23	48.6	0.4	0.2	No
Tygee Creek	12.9	23	48.6	0.6	0.3	No
Pole Canyon Creek	277	23	48.6	**12**	**6**	**Yes**
North Fork Sage Creek	21.7	23	48.6	0.9	0.4	No
Sage Creek	34.0	23	48.6	2.0	0.7	No
HoopesSpring	3.9	23	48.6	0.2	0.1	No
South Fork Sage Creek	15	23	48.6	0.7	0.3	No
Lower Sage Valley	17.5	23	48.6	0.8	0.4	No
Crow Creek	8.1	23	48.6	0.4	0.2	No

TABLE 3-18
Tier 2 Assessment of Sediment ECOPC by Drainage

Drainage Group	Sediment EPC (mg/kg dw)	TRV_{low} (mg/kg dw)	TRV_{high} (mg/kg dw)	HQ_{low}	HQ_{high}	Tier 3 ECOPC
Selenium						
Smoky Creek	0.63	2	4	0.3	0.2	No
Roberts Creek	0.4	2	4	0.2	0.1	No
Tygee Creek	0.73	2	4	0.4	0.2	No
Pole Canyon Creek	33.5	2	4	**17**	**8**	**Yes**
North Fork Sage Creek	6.5	2	4	**3**	**2**	**Yes**
Sage Creek	1.4	2	4	0.7	0.4	No
HoopesSpring	10.5	2	4	**5**	**3**	**Yes**
South Fork Sage Creek	1.2	2	4	0.6	0.3	No
Lower Sage Valley	7	2	4	**4**	**2**	**Yes**
Crow Creek	1.5	2	4	0.8	0.4	No
Silver						
Smoky Creek	0.26	1	4.5	0.3	0.06	No
Roberts Creek	0.27	1	4.5	0.3	0.06	No
Tygee Creek	0.14	1	4.5	0.1	0.03	No
Pole Canyon Creek	3.6	1	4.5	**4**	0.8	Uncertain
North Fork Sage Creek	0.19	1	4.5	0.2	0.04	No
Sage Creek	0.62	1	4.5	0.6	0.1	No
Hoopes Spring	0.64	1	4.5	0.6	0.1	No
South Fork Sage Creek	0.21	1	4.5	0.2	0.05	No
Lower Sage Valley	0.23	1	4.5	0.2	0.05	No
Crow Creek	0.08	1	4.5	0.1	0.02	No
Thallium						
Smoky Creek	0.2	--	0.858	--	0.2	No
Roberts Creek	0.12	--	0.858	--	0.1	No
Tygee Creek	0.17	--	0.858	--	0.2	No
Pole Canyon Creek	1.1	--	0.858	--	1	No
North Fork Sage Creek	0.18	--	0.858	--	0.2	No
Sage Creek	0.30	--	0.858	--	0.3	No
Hoopes Spring	0.33	--	0.858	--	0.4	No
South Fork Sage Creek	0.22	--	0.858	--	0.3	No
Lower Sage Valley	0.25	--	0.858	--	0.3	No
Crow Creek	0.15	--	0.858	--	0.2	No
Vanadium						
Smoky Creek	29.6	--	--	No TRV	No TRV	Uncertain
Roberts Creek	26.1	--	--	No TRV	No TRV	Uncertain
Tygee Creek	21.8	--	--	No TRV	No TRV	Uncertain
Pole Canyon Creek	206	--	--	No TRV	No TRV	Uncertain
North Fork Sage Creek	30.2	--	--	No TRV	No TRV	Uncertain
Sage Creek	78.45	--	--	No TRV	No TRV	Uncertain
Hoopes Spring	34.5	--	--	No TRV	No TRV	Uncertain
South Fork Sage Creek	34.3	--	--	No TRV	No TRV	Uncertain
Lower Sage Valley	26.7	--	--	No TRV	No TRV	Uncertain
Crow Creek	15.2	--	--	No TRV	No TRV	Uncertain

TABLE 3-18
Tier 2 Assessment of Sediment ECOPC by Drainage

Drainage Group	Sediment EPC (mg/kg dw)	TRV_{low} (mg/kg dw)	TRV_{high} (mg/kg dw)	HQ_{low}	HQ_{high}	Tier 3 ECOPC
Zinc						
Smoky Creek	104	120	460	0.9	0.2	No
Roberts Creek	66.4	120	460	0.6	0.1	No
Tygee Creek	61.5	120	460	0.5	0.1	No
Pole Canyon Creek	1280	120	460	**11**	**3**	**Yes**
North Fork Sage Creek	95.1	120	460	0.8	0.2	No
Sage Creek	133.3	120	460	1	0.3	No
Hoopes Spring	53.2	120	460	0.4	0.1	No
South Fork Sage Creek	85.9	120	460	0.7	0.2	No
Lower Sage Valley	77.2	120	460	0.6	0.2	No
Crow Creek	48.8	120	460	0.4	0.1	No

Notes:

ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, HQ - Hazard Quotient, mg/kg dw - milligram per kilogram dry weight, TRV - Toxicity Reference Value, "--" = Not Available

Bold = HQ > 1.0

TRV_{low} = TEC or equivalent value

TRV_{high} = PEC or equavalent value or literature derived effects threshold.

TABLE 3-19
Tier 1 Site-Wide Assessment of Fish Tissue ECOPCs

Analyte	Trout Tissue EPC	TroutTissue TRV	Sculpin Tissue EPC	Other Species Tissue TRV	Trout ECOPC	Others Species ECOPC
	(mg/kg dw)	(mg/kg dw)	(mg/kg dw)	(mg/kg dw)		
Aluminum	109	33	156.5	--	**Yes**	Uncertain
Antimony	0.041	19.23	0.0262	4.23	No	No
Arsenic	0.69	3.85	0.82	6.92	No	No
Barium	2.24	--	3.62	--	Uncertain	Uncertain
Beryllium	0.06	--	0.00633	19.73	Uncertain	No
Boron	0.25	--	0.9	4	Uncertain	No
Cadmium	0.3	2.08	0.187	1.35	No	No
Chromium	1.14	8.85	0.763	169.6	No	No
Cobalt	0.18	--	0.18	--	Uncertain	Uncertain
Copper	5.57	6.7	2.864	19.54	No	No
Iron	114.4	34.62	150.2	--	**Yes**	Uncertain
Lead	0.085	15.38	0.126	3.46	No	No
Manganese	15.2	--	21.63	--	Uncertain	Uncertain
Mercury	0.046	1.81	0.0718	3.08	No	No
Molybdenum	0.12	2.77	0.109	--	No	No
Nickel	0.59	7.69	0.597	1.54	No	No
Selenium	14	12.48	15.45	--	**Yes**	Uncertain
Silver	0.021	0.78	0.00627	1.46	No	No
Thallium	0.045		0.0351	0.19	No	No
Uranium	0.098	67.69	0.0252	--	No	No
Vanadium	0.35	1.58	1.299	2.62	No	No
Zinc	128.5	22.5	68.48	130.77	No	No

Notes:

ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, mg/kg dw - milligram per kilogram dry weight,
TRV - Toxicity Reference Value, "--" = Not Available

TABLE 3-20
Tier 2 Assessment of Fish Tissue ECOPC by Drainage

Drainage	Trout Tissue EPC	Sculpin Tissue EPC	Trout Tissue TRV	Other Species Tissue TRV	Trout HQ	Other Species HQ
	(mg/kg dw)	(mg/kg dw)	(mg/kg dw)	(mg/kg dw)		
Aluminum						
Smoky Creek	407.7	NF	33	NA	**12**	--
Tygee Creek	167.2	410.3	33	NA	**5**	**12**
Sage Creek	143.7	NF	33	NA	**4**	--
Hoopes Spring	170.9	38.4	33	NA	**5**	1
South Fork Sage Creek	65	119.7	33	NA	**2**	**4**
Lower Sage Valley	76.21	103.2	33	NA	**2**	**3**
Crow Creek	77.86	207	33	NA	**2**	**6**
Cadmium						
Smoky Creek	2	NF	2.08	1.35	1	--
Tygee Creek	0.48	0.65	2.08	1.35	0.2	0.5
Sage Creek	0.39	NF	2.08	1.35	0.2	--
Hoopes Spring	0.19	0.12	2.08	1.35	0.1	0.1
South Fork Sage Creek	0.48	0.33	2.08	1.35	0.2	0.2
Lower Sage Valley	0.12	0.11	2.08	1.35	0.1	0.1
Crow Creek	0.12	0.12	2.08	1.35	0.1	0.1
Chromium						
Smoky Creek	1.41	NF	8.85	169.6	0.2	--
Tygee Creek	0.64	1.47	8.85	169.6	0.1	0.009
Sage Creek	1	NF	8.85	169.6	0.1	--
Hoopes Spring	7.45	0.56	8.85	169.6	0.8	0.003
South Fork Sage Creek	1.46	0.72	8.85	169.6	0.2	0.004
Lower Sage Valley	1.23	0.53	8.85	169.6	0.1	0.003
Crow Creek	0.72	1.1	8.85	169.6	0.1	0.006
Copper						
Smoky Creek	4.44	NF	6.70	19.54	0.7	--
Tygee Creek	4.1	3.74	6.70	19.54	1	0.2
Sage Creek	6.67	NF	6.70	19.54	1	--
Hoopes Spring	4.33	2.42	6.70	19.54	0.6	0.1
South Fork Sage Creek	5.4	2.71	6.70	19.54	0.8	0.1
Lower Sage Valley	7.35	3.01	6.70	19.54	1	0.2
Crow Creek	11.24	2.7	6.70	19.54	**2**	0.1
Iron						
Smoky Creek	322	NF	34.62	NA	**9**	--
Tygee Creek	156.3	309.8	34.62	NA	**5**	**9**
Sage Creek	153.9	NF	34.62	NA	**4**	--
Hoopes Spring	101.1	74.9	34.62	NA	**3**	**2**
South Fork Sage Creek	93	115.9	34.62	NA	**3**	**3**
Lower Sage Valley	114.2	124.7	34.62	NA	**3**	**4**
Crow Creek	100.9	185.4	34.62	NA	**3**	**5**

TABLE 3-20
Tier 2 Assessment of Fish Tissue ECOPC by Drainage

Drainage	Trout Tissue EPC (mg/kg dw)	Sculpin Tissue EPC (mg/kg dw)	Trout Tissue TRV (mg/kg dw)	Other Species Tissue TRV (mg/kg dw)	Trout HQ	Other Species HQ
Nickel						
Smoky Creek	0.69	NF	7.69	1.54	0.1	--
Tygee Creek	2.86	0.65	7.69	1.54	0.4	0.4
Sage Creek	0.85	NF	7.69	1.54	0.1	--
Hoopes Spring	1.26	0.58	7.69	1.54	0.2	0.4
South Fork Sage Creek	0.64	0.58	7.69	1.54	0.1	0.4
Lower Sage Valley	0.61	0.55	7.69	1.54	0.1	0.4
Crow Creek	0.47	0.74	7.69	1.54	0.1	0.5
Selenium						
Smoky Creek	5.31	NF	12.48 - 14.14	12.48 - 14.14	0.4-0.4	--
Tygee Creek	6.17	4.78	12.48 - 14.14	12.48 - 14.14	0.5-0.4	0.4-0.3
Sage Creek	4.27	NF	12.48 - 14.14	12.48 - 14.14	0.3-0.3	--
Hoopes Spring	21.54	18.37	12.48 - 14.14	12.48 - 14.14	**2-2**	**2**-1
South Fork Sage Creek	13.98	17.77	12.48 - 14.14	12.48 - 14.14	1-1	1-1
Lower Sage Valley	17.85	20.22	12.48 - 14.14	12.48 - 14.14	1-1	**2**-1
Crow Creek	11.55	11.95	12.48 - 14.14	12.48 - 14.14	0.9-0.8	0.9-0.8
Vanadium						
Smoky Creek	1.1	NF	1.58	2.62	0.7	--
Tygee Creek	0.46	1.78	1.58	2.62	0.3	0.7
Sage Creek	0.37	NF	1.58	2.62	0.2	--
Hoopes Spring	0.92	0.64	1.58	2.62	0.6	0.2
South Fork Sage Creek	0.36	1.04	1.58	2.62	0.2	0.4
Lower Sage Valley	0.35	1.22	1.58	2.62	0.2	0.5
Crow Creek	0.29	1.67	1.58	2.62	0.2	0.6
Zinc						
Smoky Creek	101.1	NF	22.50	130.77	**4**	--
Tygee Creek	92.3	85.4	22.50	130.77	**4**	0.7
Sage Creek	82.9	NF	22.50	130.77	**4**	--
Hoopes Spring	164	66.1	22.50	130.77	**7**	0.5
South Fork Sage Creek	160	70	22.50	130.77	**7**	0.5
Lower Sage Valley	148.4	63	22.50	130.77	**7**	0.5
Crow Creek	148.6	78.1	22.50	130.77	**7**	0.6

Notes:

ECOPC - Ecological Chemical of Potential Concern, HQ - Hazard Quotient, mg/kg dw - milligram per kilogram dry weight,
TRV - Toxicity Reference Value, NF - Not Found, "--" = Not Available
Bold = HQ > 1.0

No TRVs were avalable for barium, cobalt, and manganese. These ECOPCs are carried forward as posing uncertain risk potential.

For selenium, the range of HQs is shown based on the EPA derived EC10 and Simplot derived EC10 for the brown trout study.

TABLE 3-21
Amphibian HQs by Site for Selenium in each Drainage Exceeding the Tier 2 Screening TRV

Drainage	Location	Sculpin Tissue EPC (mg/kg dw)	NOEC TRV (mg/kg dw)	LOEC TRV (mg/kg dw)	NOEC HQ	LOEC HQ
Selenium						
Crow Creek	CC-1A	14.7	20	24.8	0.7	0.6
Crow Creek	CC-350	8.9	20	24.8	0.4	0.4
Hoopes Spring	HS-3	18.4	20	24.8	0.9	0.7
Lower Sage Valley	LSV-2c	21.4	20	24.8	1	0.9
Lower Sage Valley	LSV-3	21.6	20	24.8	1	0.9
Lower Sage Valley	LSV-4	22.6	20	24.8	1	0.9
Tygee Creek	LT-5	4.8	20	24.8	0.2	0.2
South Fork Sage Creek	LSS	17.8	20	24.8	0.9	0.7

Notes:

EPC - Exposure Point Concentration, TRV - Toxicity Reference Value, LOEC - Lowest Observed Effects Concentration, NOEC - No-Observed Effects Concentration, HQ - Hazard Quotient, mg/kg dw - milligram per kilogram dry weight

Sculpin tissue data is used here as a surrogate for amphibian tissue due to similar feeding habits.

Amphibian TRVs used are discussed in Section 3.2.1.3.

TABLE 3-22
Tier 3 Assessment of ECOPCs in Surface Water by Drainage Upstream and Downstream of Significant Inputs or Sources

Drainage	Mean Site-Specific Hardness	Surface Water EPC Upstream	Surface Water EPC Downstream	Surface Water Screening Benchmark for Aquatic Life	Surface Water Screening Benchmark for Aquatic Life	$HQ_{chronic}$	HQ_{acute}	$HQ_{chronic}$	HQ_{acute}
	(mg/L $CaCO_3$)	(mg/L)	(mg/L)	Chronic (mg/L)	Acute (mg/L)	Upstream		Downstream	
Aluminum, Total									
Smoky Creek	225	0.43	0.85	4.16	10.39	0.1	0.04	0.2	0.1
Tygee/Roberts Creek	258	1.57	0.11	5.02	12.53	0.3	0.1	0.02	0.01
Pole Canyon Creek	187	0.62	0.032	3.23	8.06	0.2	0.1	0.01	0.004
North Fork Sage Creek and North Sage Valley	233	2.47	2.24	4.37	10.90	0.6	0.2	0.5	0.2
Sage Creek	181	0.34	2.07	3.09	7.71	0.1	0.0	0.7	0.3
Hoopes Spring	212	NA[1]	0.024	3.84	9.57	NA[1]	NA[1]	0.01	0.003
South Fork Sage Creek	179	0.91	1.93	3.04	7.59	0.3	0.1	0.6	0.3
Lower Sage Valley	216	0.75	0.46	3.93	9.82	0.2	0.1	0.1	0.05
Crow Creek	212	0.9	0.54	3.84	9.57	0.2	0.1	0.1	0.1
Arsenic, Dissolved									
Smoky Creek	225	0.00056	0.00093	0.15	0.34	0.004	0.002	0.006	0.003
Tygee/Roberts Creek	258	0.0013	0.0014	0.15	0.34	0.01	0.004	0.009	0.004
Pole Canyon Creek	187	0.00087	0.27	0.15	0.34	0.01	0.003	**2**	0.8
North Fork Sage Creek and North Sage Valley	233	0.0013	0.0016	0.15	0.34	0.01	0.004	0.01	0.005
Sage Creek	181	0.00046	0.00061	0.15	0.34	0.00	0.001	0.004	0.002
Hoopes Spring	212	NA[1]	0.0028	0.15	0.34	NA[1]	NA[1]	0.02	0.01
South Fork Sage Creek	179	0.00043	0.00096	0.15	0.34	0.003	0.001	0.01	0.003
Lower Sage Valley	216	0.00056	0.0017	0.15	0.34	0.004	0.002	0.01	0.005
Crow Creek	212	0.00088	0.0013	0.15	0.34	0.01	0.003	0.01	0.004
Cadmium, Dissolved									
Smoky Creek	225	0.000036	0.000039	0.00091	0.0024	0.04	0.01	0.04	0.02
Tygee/Roberts Creek	258	0.000063	0.00011	0.00099	0.0027	0.1	0.02	0.1	0.04
Pole Canyon Creek	187	0.00011	0.027	0.00082	0.0021	0.1	0.1	**33**	**13**
North Fork Sage Creek and North Sage Valley	233	0.000036	0.00002	0.00093	0.0025	0.04	0.01	0.02	0.01
Sage Creek	181	0.000036	0.000036	0.00080	0.0020	0.04	0.02	0.04	0.02
Hoopes Spring	212	NA[1]	0.00012	0.00088	0.0023	NA[1]	NA[1]	0.1	0.1
South Fork Sage Creek	179	0.000036	0.000078	0.00080	0.0020	0.05	0.02	0.1	0.04
Lower Sage Valley	216	0.000036	0.00005	0.00089	0.0023	0.04	0.02	0.1	0.02
Crow Creek	212	0.000036	0.000036	0.00088	0.0023	0.04	0.02	0.04	0.02
Iron, Total									
Smoky Creek	225	0.34	0.78	1.0	NA	0.3	NA	0.8	NA
Tygee/Roberts Creek	258	0.99	0.3	1.0	NA	1.0	NA	0.3	NA
Pole Canyon Creek	187	0.46	0.061	1.0	NA	0.5	NA	0.1	NA
North Fork Sage Creek and North Sage Valley	233	1.85	2.29	1.0	NA	**2**	NA	**2**	NA
Sage Creek	181	0.25	1.55	1.0	NA	0.3	NA	**2**	NA
Hoopes Spring	212	NA[1]	0.03	1.0	NA	NA[1]	NA[1]	0.0	NA
South Fork Sage Creek	179	0.64	1.47	1.0	NA	0.6	NA	1	NA
Lower Sage Valley	216	0.65	0.4	1.0	NA	0.6	NA	0.4	NA
Crow Creek	212	0.69	0.42	1.0	NA	0.7	NA	0.4	NA

TABLE 3-22
Tier 3 Assessment of ECOPCs in Surface Water by Drainage Upstream and Downstream of Significant Inputs or Sources

Drainage	Mean Site-Specific Hardness	Surface Water EPC Upstream	Surface Water EPC Downstream	Surface Water Screening Benchmark for Aquatic Life	Surface Water Screening Benchmark for Aquatic Life	$HQ_{chronic}$	HQ_{acute}	$HQ_{chronic}$	HQ_{acute}
	(mg/L $CaCO_3$)	(mg/L)	(mg/L)	Chronic (mg/L)	Acute (mg/L)	Upstream		Downstream	
Nickel, Dissolved									
Smoky Creek	225	0.003	0.003	0.103	0.930	0.03	0.003	0.03	0.004
Tygee/Roberts Creek	258	0.003	0.004	0.116	1.044	0.03	0.003	0.03	0.004
Pole Canyon Creek	187	0.003	0.429	0.088	0.795	0.03	0.003	**5**	0.5
North Fork Sage Creek and North Sage Valley	233	0.004	0.006	0.106	0.958	0.03	0.004	0.1	0.01
Sage Creek	181	0.002	0.003	0.086	0.774	0.03	0.003	0.03	0.003
Hoopes Spring	212	NA[1]	0.003	0.098	0.884	NA[1]	NA[1]	0.03	0.003
South Fork Sage Creek	179	0.003	0.002	0.085	0.766	0.03	0.004	0.03	0.003
Lower Sage Valley	216	0.003	0.003	0.100	0.898	0.03	0.004	0.03	0.003
Crow Creek	212	0.003	0.003	0.098	0.884	0.03	0.003	0.03	0.004
Selenium, Total									
Smoky Creek	225	0.0002	0.0004	0.005	0.02	0.04	0.01	0.1	0.0
Tygee/Roberts Creek	258	0.00068	0.00055	0.005	0.02	0.14	0.03	0.1	0.028
Pole Canyon Creek	187	0.00035	5.83	0.005	0.02	0.1	0.018	**1166**	**292**
North Fork Sage Creek and North Sage Valley	233	0.0005	0.012	0.005	0.02	0.1	0.025	**2**	0.6
Sage Creek	181	0.00091	0.00021	0.005	0.02	0.18	0.046	0.04	0.011
Hoopes Spring	212	NA[1]	0.043	0.005	0.02	NA[1]	NA[1]	**9**	**2**
South Fork Sage Creek	179	0.00052	0.015	0.005	0.02	0.1	0.03	**3**	0.8
Lower Sage Valley	216	0.002	0.026	0.005	0.02	0.4	0.1	**5**	1
Crow Creek	212	0.0012	0.01	0.005	0.02	0.24	0.1	**2**	0.52
Zinc, Dissolved									
Smoky Creek	225	0.0028	0.0034	0.23	0.23	0.01	0.01	0.01	0.01
Tygee/Roberts Creek	258	0.0043	0.0024	0.26	0.26	0.02	0.02	0.01	0.01
Pole Canyon Creek	187	0.003	1.27	0.20	0.20	0.01	0.02	**6**	**6**
North Fork Sage Creek and North Sage Valley	233	0.0041	0.0013	0.24	0.24	0.02	0.02	0.01	0.01
Sage Creek	181	0.0019	0.0024	0.20	0.19	0.01	0.01	0.01	0.01
Hoopes Spring	212	NA[1]	0.0038	0.22	0.22	NA[1]	NA[1]	0.02	0.02
South Fork Sage Creek	179	0.0023	0.0054	0.19	0.19	0.01	0.01	0.03	0.03
Lower Sage Valley	216	0.0023	0.0054	0.23	0.23	0.01	0.01	0.02	0.02
Crow Creek	212	0.015	0.0029	0.22	0.22	0.1	0.1	0.01	0.01

Notes:

ECOPC = Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, HQ = Hazard Quotient, mg/L = milligram per liter, NA - Not Available

1. No Upstream reference location exists for Hoopes Springs

Bold = HQ > 1.0

TABLE 3-23
Tier 3 Assessment of Selenium Concentrations in Surface Waters of the Site

Drainage	Location	Surface Water EPC	Surface Water Criteria for Aquatic Life	Surface Water Criteria for Aquatic Life	Site-Specific WQ Criteria	$HQ_{Chronic}$	HQ_{Acute}
		(mg/L)	Chronic (mg/L)	Acute (mg/L)	Chronic (mg/L)		
Pole Canyon Creek	LP-1	5.83	0.005	0.02	TBD[1]	**1166**	**292**
Pole Canyon Creek	LP-PD	0.00035	0.005	0.02	TBD[1]	0.1	0.02
North Fork Sage Creek and North Sage Valley	NSV-6, b,c,d	0.012	0.005	0.02	TBD[1]	**2**	0.6
Hoopes Spring	HS	0.051	0.005	0.02	TBD[1]	**10**	**3**
Hoopes Spring	HS-2	0.04	0.005	0.02	TBD[1]	**8**	**2**
Hoopes Spring	HS-3	0.042	0.005	0.02	TBD[1]	**8**	**2**
Hoopes Spring	HSA1	0.017	0.005	0.02	TBD[1]	**3**	1
Hoopes Spring	HSA2	0.013	0.005	0.02	TBD[1]	**3**	0.6
Hoopes Spring	HSC1	0.054	0.005	0.02	TBD[1]	**11**	**3**
South Fork Sage Creek	LSS	0.014	0.005	0.02	TBD[1]	**3**	0.7
South Fork Sage Creek	LSS-2	0.013	0.005	0.02	TBD[1]	**3**	0.6
South Fork Sage Creek	LSS-M1	0.0049	0.005	0.02	TBD[1]	1	0.2
South Fork Sage Creek	LSS-M2	0.0052	0.005	0.02	TBD[1]	1	0.3
Lower Sage Valley	LSV-1B	0.031	0.005	0.02	TBD[1]	**6**	**2**
Lower Sage Valley	LSV-2A	0.029	0.005	0.02	TBD[1]	**6**	1
Lower Sage Valley	LSV-2C	0.033	0.005	0.02	TBD[1]	**7**	**2**
Lower Sage Valley	LSV-3	0.024	0.005	0.02	TBD[1]	**5**	1
Lower Sage Valley	LSV-3a	0.022	0.005	0.02	TBD[1]	**4**	1
Lower Sage Valley	LSV-4	0.037	0.005	0.02	TBD[1]	**7**	**2**
Crow Creek	CC-1A	0.012	0.005	0.02	TBD[1]	**2**	0.6
Crow Creek	CC-WY-01	0.011	0.005	0.02	TBD[1]	**2**	0.6

Notes:

ECOPC - Ecological Chemical of Potential Concern, HQ - Hazard Quotient, mg/L - milligram per liter, TBD[1] = To Be Decided (Refer to Table 3-30)

Bold = HQ > 1.0

TABLE 3-24
Tier 3 Sediment HQs by Site for ECOPCs in each Drainage
Exceeding the Tier 2 Screening TRVs

Drainage	Location	Sediment Concentration (mg/kg dw)	TRV_{low} (mg/kg dw	TRV_{high} (mg/kg dw)	HQ_{low}	HQ_{high}
Arsenic						
Pole Canyon Creek	LP-PD	8.6	9.8	33	0.9	0.3
Pole Canyon Creek	LPT1-2	22.7	9.8	33	**2**	0.7
Pole Canyon Creek	LPT2-2	19.2	9.8	33	**2**	0.6
Pole Canyon Creek	LPT3-2	11.2	9.8	33	1	0.3
Barium						
Smoky Creek	LSm	86	20	60	**4**	1
Smoky Creek	USm	136	20	60	**7**	**2**
Roberts Creek	UR-3	59.9	20	60	**3**	1
Tygee Creek	LT-5	171	20	60	**9**	**3**
Pole Canyon Creek	LP-PD	158	20	60	**8**	**3**
Pole Canyon Creek	LPT1-2	96.4	20	60	**5**	**2**
Pole Canyon Creek	LPT2-2	90.3	20	60	**5**	**2**
Pole Canyon Creek	LPT3-2	176	20	60	**9**	**3**
North Fork Sage Creek	NSV-6	198	20	60	**10**	**3**
Sage Creek	LS	136	20	60	**7**	**2**
Sage Creek	SV-1	212	20	60	**11**	**4**
Sage Creek	US	141	20	60	**7**	**2**
Sage Creek	US-4	119	20	60	**6**	**2**
Hoopes Spring	HS-3	52.2	20	60	**3**	0.9
South Fork Sage Creek	LSS	87.4	20	60	**4**	**1**
Lower Sage Valley	LSV-1	106	20	60	**5**	**2**
Lower Sage Valley	LSV-2c	112	20	60	**6**	**2**
Lower Sage Valley	LSV-3	82.4	20	60	**4**	1
Lower Sage Valley	LSV-4	93.4	20	60	**5**	**2**
Crow Creek	CC-1A	83.7	20	60	**4**	1
Crow Creek	CC-350	61	20	60	**3**	1
Cadmium						
Smoky Creek	LSm	3.7	1	5	**4**	0.7
Smoky Creek	USm	1.3	1	5	1	0.3
Roberts Creek	UR-3	4.8	1	5	**5**	1
Tygee Creek	LT-5	2.3	1	5	**2**	0.5
Pole Canyon Creek	LP-PD	17.9	1	5	**18**	**4**
Pole Canyon Creek	LPT1-2	42.9	1	5	**43**	**9**
Pole Canyon Creek	LPT2-2	39.9	1	5	**40**	**8**
Pole Canyon Creek	LPT3-2	19.3	1	5	**19**	**4**
North Fork Sage Creek	NSV-6	3.1	1	5	**3**	0.6
Sage Creek	LS	2.6	1	5	**3**	0.5
Sage Creek	SV-1	14.3	1	5	**14**	**3**
Sage Creek	US	1.3	1	5	1	0.3
Sage Creek	US-4	1.3	1	5	1	0.3
Hoopes Spring	HS-3	5.8	1	5	**6**	1
South Fork Sage Creek	LSS	3.8	1	5	**4**	0.8
Lower Sage Valley	LSV-1	1.7	1	5	**2**	0.3
Lower Sage Valley	LSV-2c	2	1	5	**2**	0.4
Lower Sage Valley	LSV-3	3.4	1	5	**3**	0.7
Lower Sage Valley	LSV-4	2.9	1	5	**3**	0.6
Crow Creek	CC-1A	1.5	1	5	**2**	0.3
Crow Creek	CC-350	1.6	1	5	**2**	0.3

TABLE 3-24
Tier 3 Sediment HQs by Site for ECOPCs in each Drainage
Exceeding the Tier 2 Screening TRVs

Drainage	Location	Sediment Concentration (mg/kg dw)	TRV_{low} (mg/kg dw	TRV_{high} (mg/kg dw)	HQ_{low}	HQ_{high}
Chromium						
Pole Canyon Creek	LP-PD	83.6	43	111	**2**	0.8
Pole Canyon Creek	LPT1-2	387	43	111	**9**	**3**
Pole Canyon Creek	LPT2-2	327	43	111	**8**	**3**
Pole Canyon Creek	LPT3-2	117	43	111	**3**	1
Sage Creek	LS	36	43	111	0.8	0.3
Sage Creek	SV-1	77.2	43	111	**2**	0.7
Sage Creek	US	21	43	111	0.5	0.2
Sage Creek	US-4	24.2	43	111	0.6	0.2
Copper						
Pole Canyon Creek	LP-PD	30.6	32	149	1	0.2
Pole Canyon Creek	LPT1-2	65.4	32	149	**2**	0.4
Pole Canyon Creek	LPT2-2	58.4	32	149	**2**	0.4
Pole Canyon Creek	LPT3-2	31.2	32	149	1	0.2
Manganese						
Smoky Creek	LSm	642	460	1100	1	0.6
Smoky Creek	USm	1490	460	1100	**3**	1
Roberts Creek	UR-3	643	460	1100	1	0.6
Tygee Creek	LT-5	976	460	1100	**2**	0.9
Pole Canyon Creek	LP-PD	1250	460	1100	**3**	1
Pole Canyon Creek	LPT1-2	648	460	1100	1	0.6
Pole Canyon Creek	LPT2-2	542	460	1100	1	0.5
Pole Canyon Creek	LPT3-2	1400	460	1100	**3**	1
North Fork Sage Creek	NSV-6	5720	460	1100	**12**	**5**
Sage Creek	LS	1340	460	1100	**3**	1
Sage Creek	SV-1	1500	460	1100	**3**	1
Sage Creek	US	1240	460	1100	**3**	1
Sage Creek	US-4	1180	460	1100	**3**	1
South Fork Sage Creek	LSS	738	460	1100	**2**	0.7
Nickel						
Pole Canyon Creek	LP-PD	85.5	23	48.6	**4**	**2**
Pole Canyon Creek	LPT1-2	277	23	48.6	**12**	**6**
Pole Canyon Creek	LPT2-2	253	23	48.6	**11**	**5**
Pole Canyon Creek	LPT3-2	102	23	48.6	**4**	**2**
Sage Creek	LS	22.9	23	48.6	1	0.5
Sage Creek	SV-1	36.1	23	48.6	**2**	0.7
Sage Creek	US	18.2	23	48.6	0.8	0.4
Sage Creek	US-4	22	23	48.6	1	0.5

TABLE 3-24
Tier 3 Sediment HQs by Site for ECOPCs in each Drainage
Exceeding the Tier 2 Screening TRVs

Drainage	Location	Sediment Concentration (mg/kg dw)	TRV_{low} (mg/kg dw	TRV_{high} (mg/kg dw)	HQ_{low}	HQ_{high}
Selenium						
North Fork Sage Creek	NSV-6	6.5	2	4	**3**	**2**
Hoopes Spring	HS-3	10.5	2	4	**5**	**3**
Pole Canyon Creek	LP-PD	13.4	2	4	**7**	**3**
Pole Canyon Creek	LPT1-2	47.9	2	4	**24**	**12**
Pole Canyon Creek	LPT1-2	22.8	2	4	**11**	**6**
Pole Canyon Creek	LPT2-2	18	2	4	**9**	**5**
Pole Canyon Creek	LPT2-2	19.2	2	4	**10**	**5**
Pole Canyon Creek	LPT3-2	9.3	2	4	**5**	**2**
Pole Canyon Creek	LPT3-2	1.7	2	4	0.9	0.4
Lower Sage Valley	LSV-1	1.6	2	4	0.8	0.4
Lower Sage Valley	LSV-2c	7	2	4	**4**	**2**
Lower Sage Valley	LSV-3	6.6	2	4	**3**	**2**
Lower Sage Valley	LSV-4	4.7	2	4	**2**	**1**
Silver						
Pole Canyon Creek	LP-PD	0.93	1	4.5	0.9	0.2
Pole Canyon Creek	LPT1-2	3.6	1	4.5	**4**	0.8
Pole Canyon Creek	LPT2-2	2.8	1	4.5	**3**	0.6
Pole Canyon Creek	LPT3-2	1.2	1	4.5	1	0.3
Zinc						
Pole Canyon Creek	LP-PD	403	120	460	**3**	0.9
Pole Canyon Creek	LPT1-2	1230	120	460	**10**	**3**
Pole Canyon Creek	LPT2-2	1280	120	460	**11**	**3**
Pole Canyon Creek	LPT3-2	476	120	460	**4**	1

Notes:
ECOPC - Ecological Chemical of Potential Concern, HQ - Hazard Quotient, mg/kg dw - milligram per kilogram dry weight,
TRV - Toxicity Reference Value

Bold = HQ > 1.0
TRV_{low} = TEC or equivalent value
TRV_{high} = PEC or equavalent value or literature derived effects threshold.

TABLE 3-25
Sediment Mean Probable Effects Concentration Quotient for ECOPCs with Developed PEC Values

Location	Probable Effects Concentration Quotient (PEC-Q)							Mean PEC-Q	Cummulative Metal Potential Risk (Mean PEC-Q > 0.5)	Cummulative Metal Potential Risk (Mean PEC-Q > 0.7)
	Arsenic	Cadmium	Chromium	Copper	Mercury	Nickel	Zinc			
Smoky Creek	0.13	0.74	0.32	0.14	0.04	0.48	0.23	0.30	No	No
Roberts Creek	0.07	0.96	0.46	0.04	0.03	0.20	0.14	0.27	No	No
Tygee Creek	0.10	0.46	0.19	0.07	0.02	0.27	0.13	0.18	No	No
Pole Canyon Creek	0.55	8.58	3.49	0.44	0.25	5.70	2.78	**3.11**	**Yes**	**Yes**
North Fork Sage Creek	0.14	0.62	0.28	0.12	0.06	0.45	0.21	0.27	No	No
Sage Creek	0.24	2.46	0.63	0.21	0.05	0.70	0.29	0.65	**Yes**	No
Hoopes Spring	0.07	1.16	0.45	0.03	0.02	0.08	0.12	0.28	No	No
South Fork Sage Creek	0.13	0.76	0.34	0.07	0.02	0.31	0.19	0.26	No	No
Lower Sage Valley	0.10	0.68	0.26	0.08	0.03	0.36	0.17	0.24	No	No
Crow Creek	0.05	0.32	0.20	0.04	0.02	0.17	0.11	0.13	No	No

Notes:

ECOPC - Ecological Chemical of Potential Concern, PEC-Q - Probable Effects Concentration Quotient

Bold = Mean PEC-Q > 0.7

TABLE 3-26
Sediment Mean Probable Effects Concentration Quotient for ECOPCs with Developed PEC Values and ECOPCs with Other Effects Thresholds

Location	Probable Effects Concentration Quotient (PEC-Q)							Other Effects Based Thresholds						Mean PEC-Q	Cummulative Metal Potential Risk (Mean PEC-Q> 0.5)	Cummulative Metal Potential Risk (Mean PEC-Q> 0.7)
	Arsenic	Cadmium	Chromium	Copper	Mercury	Nickel	Zinc	Iron	Manganese	Silver	Boron	Molybdenum	Thallium			
Smoky Creek	0.13	0.74	0.32	0.14	0.04	0.48	0.23	0.56	1	0.06	0.05	0.00	0.23	0.33	No	No
Roberts Creek	0.07	0.96	0.46	0.04	0.03	0.20	0.14	0.16	0.6	0.06	0.05	0.00	0.14	0.22	No	No
Tygee Creek	0.10	0.46	0.19	0.07	0.02	0.27	0.13	0.28	0.9	0.03	0.05	0.00	0.20	0.21	No	No
Pole Canyon Creek	0.55	8.58	3.49	0.44	0.25	5.70	2.78	0.52	1	0.8	0.16	0.00	1.28	**1.99**	**Yes**	**Yes**
North Fork Sage Creek	0.14	0.62	0.28	0.12	0.06	0.45	0.21	0.58	5	0.04	0.05	0.00	0.21	0.61	**Yes**	No
Sage Creek	0.24	2.46	0.63	0.21	0.05	0.70	0.29	0.61	1	0.1	0.08	0.00	0.35	0.55	**Yes**	No
Hoopes Spring	0.07	1.16	0.45	0.03	0.02	0.08	0.12	0.04	0.2	0.1	0.03	0.00	0.38	0.21	No	No
South Fork Sage Creek	0.13	0.76	0.34	0.07	0.02	0.31	0.19	0.29	0.7	0.05	0.06	0.00	0.26	0.24	No	No
Lower Sage Valley	0.10	0.68	0.26	0.08	0.03	0.36	0.17	0.38	2	0.05	0.06	0.00	0.29	0.32	No	No
Crow Creek	0.05	0.32	0.20	0.04	0.02	0.17	0.11	0.17	0.3	0.02	0.04	0.00	0.17	0.12	No	No

Notes:
ECOPC - Ecological Chemical of Potential Concern, PEC-Q - Probable Effects Concentration Quotient
Bold = Mean PEC-Q > 0.7

TABLE 3-27
Benthic Tissue HQs by Site for Selenium in each Drainage
Exceeding the Tier 2 Screening TRV

Drainage	Location	Benthic Invertebrate Tissue EPC (mg/kg dw)	TRV_{NOEC} (mg/kg dw)	TRV_{LOEC} (mg/kg dw)	HQ_{NOEC}	HQ_{LOEC}
Selenium						
Crow Creek	CC-1A	16.7	24.2	26.9	0.7	0.6
Crow Creek	CC-350	4.24	24.2	26.9	0.2	0.2
Hoopes Spring	HS-3	24.9	24.2	26.9	1.0	0.9
Lower Sage Valley	LSV-2c	53.4	24.2	26.9	**2**	**2**
Lower Sage Valley	LSV-3	64.6	24.2	26.9	**3**	**2**
Lower Sage Valley	LSV-4	24.1	24.2	26.9	1	0.9
North Fork Sage Creek	NSV-6	11.9	24.2	26.9	0.5	0.4
Tygee Creek	LT-5	3.69	24.2	26.9	0.2	0.1
Roberts Creek	UR-3	1.53	24.2	26.9	0.1	0.1
Sage Creek	LS	7.98	24.2	26.9	0.3	0.3
Sage Creek	US	4.39	24.2	26.9	0.2	0.2
Sage Creek	US-4	3.46	24.2	26.9	0.1	0.1
Smoky Creek	LSm	3.11	24.2	26.9	0.1	0.1
Smoky Creek	USm	5.93	24.2	26.9	0.2	0.2
South Fork Sage Creek	LSS	12.6	24.2	26.9	0.5	0.5
Pole Canyon Creek	LP-PD	16.9	24.2	26.9	0.7	0.6

Notes:

ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, HQ - Hazard Quotient, mg/kg dw - milligram per kilogram dry weight, TRV - Toxicity Reference Value

Bold = HQ > 1.0

Benthic Invertebrate EPC is the maximum concentration observed at a site from 201 and 2011 sampling efforts.

TRV_{low} = TEC or equivalent value

TRV_{high} = PEC or equavalent value or literature derived effects threshold.

TABLE 3-28
Tier 3 Assessment of Trout Tissue ECOPC by Drainage and Trout Species

Drainage	Species	Location	ECOPC Concentration Max[1]	Trout Tissue EPC (mg/kg dw)	Trout Tissue TRV (mg/kg dw)	HQ
Aluminum						
Smoky Creek	YCT	LSm	407.7	407.7	33	**12**
Tygee Creek	YCT	LT-5	188.0	167.2	33	**5**
Sage Creek	YCT	US-4	315.0	175.0	33	**5**
Sage Creek	YCT	LS	477.0	217.5	33	**7**
Sage Creek	YCT	US	243.0	109.0	33	**3**
Hoopes Spring	Brown	HS-3	346.7	181.8	33	**6**
Hoopes Spring	YCT	HS-3	18.9	18.9	33	0.6
South Fork Sage Creek	Brown	LSS	109.0	65.0	33	**2**
Lower Sage Valley	Brown	LSV-2C	214.0	138.5	33	**4**
Lower Sage Valley	Brown	LSV-3	76.5	45.6	33	1
Lower Sage Valley	Brown	LSV-4	221.0	91.5	33	**3**
Lower Sage Valley	YCT	LSV-2C	75.9	75.9	33	**2**
Lower Sage Valley	YCT	LSV-4	20.9	19.4	33	0.6
Crow Creek	Brown	CC-350	85.1	85.1	33	**3**
Crow Creek	Brown	CC-1A	214.0	114.3	33	**3**
Crow Creek	YCT	CC-350	175.0	93.5	33	**3**
Crow Creek	YCT	CC-1A	20.6	20.6	33	0.6
Barium						
Smoky Creek	YCT	LSm	4.4	4.4	--	--
Tygee Creek	YCT	LT-5	4.9	4.7	--	--
Sage Creek	YCT	US-4	3.3	2.5	--	--
Sage Creek	YCT	LS	3.8	2.3	--	--
Sage Creek	YCT	US	2.8	1.7	--	--
Hoopes Spring	Brown	HS-3	5.7	3.2	--	--
Hoopes Spring	YCT	HS-3	1.5	1.5	--	--
South Fork Sage Creek	Brown	LSS	2.9	1.8	--	--
Lower Sage Valley	Brown	LSV-2C	3.7	2.7	--	--
Lower Sage Valley	Brown	LSV-3	2.1	1.7	--	--
Lower Sage Valley	Brown	LSV-4	3.6	2.5	--	--
Lower Sage Valley	YCT	LSV-2C	3.8	3.8	--	--
Lower Sage Valley	YCT	LSV-4	2.3	2.2	--	--
Crow Creek	Brown	CC-350	2.2	2.2	--	--
Crow Creek	Brown	CC-1A	4.3	2.9	--	--
Crow Creek	YCT	CC-350	5.8	3.4	--	--
Crow Creek	YCT	CC-1A	1.1	1.1	--	--

TABLE 3-28
Tier 3 Assessment of Trout Tissue ECOPC by Drainage and Trout Species

Drainage	Species	Location	ECOPC Concentration Max[1]	Trout Tissue EPC (mg/kg dw)	Trout Tissue TRV (mg/kg dw)	HQ
Cobalt						
Smoky Creek	YCT	LSm	0.4	0.4	--	--
Tygee Creek	YCT	LT-5	0.2	0.2	--	--
Sage Creek	YCT	US-4	0.3	0.3	--	--
Sage Creek	YCT	LS	0.3	0.2	--	--
Sage Creek	YCT	US	0.5	0.3	--	--
Hoopes Spring	Brown	HS-3	0.3	0.2	--	--
Hoopes Spring	YCT	HS-3	0.3	0.3	--	--
South Fork Sage Creek	Brown	LSS	0.2	0.2	--	--
Lower Sage Valley	Brown	LSV-2C	0.4	0.3	--	--
Lower Sage Valley	Brown	LSV-3	0.4	0.2	--	--
Lower Sage Valley	Brown	LSV-4	0.2	0.1	--	--
Lower Sage Valley	YCT	LSV-2C	0.3	0.3	--	--
Lower Sage Valley	YCT	LSV-4	0.2	0.1	--	--
Crow Creek	Brown	CC-350	0.1	0.1	--	--
Crow Creek	Brown	CC-1A	0.3	0.2	--	--
Crow Creek	YCT	CC-350	0.2	0.1	--	--
Crow Creek	YCT	CC-1A	0.1	0.1	--	--
Copper						
Smoky Creek	YCT	LSm	4.4	4.4	6.7	0.7
Tygee Creek	YCT	LT-5	4.9	4.1	6.7	0.6
Sage Creek	YCT	US-4	8.5	7.0	6.7	1
Sage Creek	YCT	LS	24.3	13.5	6.7	**2**
Sage Creek	YCT	US	6.9	5.4	6.7	0.8
Hoopes Spring	Brown	HS-3	5.5	4.2	6.7	0.6
Hoopes Spring	YCT	HS-3	5.1	5.1	6.7	0.8
South Fork Sage Creek	Brown	LSS	7.5	5.4	6.7	0.8
Lower Sage Valley	Brown	LSV-2C	9.8	5.6	6.7	0.8
Lower Sage Valley	Brown	LSV-3	12.2	5.8	6.7	0.9
Lower Sage Valley	Brown	LSV-4	16.2	10.8	6.7	**2**
Lower Sage Valley	YCT	LSV-2C	3.8	3.8	6.7	0.6
Lower Sage Valley	YCT	LSV-4	11.7	11.1	6.7	**2**
Crow Creek	Brown	CC-350	11.0	11.0	6.7	**2**
Crow Creek	Brown	CC-1A	3.8	2.9	6.7	0.4
Crow Creek	YCT	CC-350	7.1	5.4	6.7	0.8
Crow Creek	YCT	CC-1A	3.7	3.7	6.7	0.6

TABLE 3-28
Tier 3 Assessment of Trout Tissue ECOPC by Drainage and Trout Species

Drainage	Species	Location	ECOPC Concentration Max[1]	Trout Tissue EPC (mg/kg dw)	Trout Tissue TRV (mg/kg dw)	HQ
Iron						
Smoky Creek	YCT	LSm	322	322	34.6	**9**
Tygee Creek	YCT	LT-5	173	156.3	34.6	**5**
Sage Creek	YCT	US-4	294	184.1	34.6	**5**
Sage Creek	YCT	LS	356	191.4	34.6	**6**
Sage Creek	YCT	US	270	144.9	34.6	**4**
Hoopes Spring	Brown	HS-3	184.0	102.8	34.6	**3**
Hoopes Spring	YCT	HS-3	81	81	34.6	**2**
South Fork Sage Creek	Brown	LSS	114.0	93.0	34.6	**3**
Lower Sage Valley	Brown	LSV-2C	245.0	172.4	34.6	**5**
Lower Sage Valley	Brown	LSV-3	97.0	78.04	34.6	**2**
Lower Sage Valley	Brown	LSV-4	217.0	135.2	34.6	**4**
Lower Sage Valley	YCT	LSV-2C	120	120	34.6	**3**
Lower Sage Valley	YCT	LSV-4	86	81.3	34.6	**2**
Crow Creek	Brown	CC-350	102.0	102.0	34.6	**3**
Crow Creek	Brown	CC-1A	185.0	118.6	34.6	**3**
Crow Creek	YCT	CC-350	159	109.1	34.6	**3**
Crow Creek	YCT	CC-1A	49	49	34.6	1
Manganese						
Smoky Creek	YCT	LSm	23.8	23.8	--	--
Tygee Creek	YCT	LT-5	31.7	26.5	--	--
Sage Creek	YCT	US-4	23.9	16.3	--	--
Sage Creek	YCT	LS	29.2	19.6	--	--
Sage Creek	YCT	US	19.4	10.5	--	--
Hoopes Spring	Brown	HS-3	17.5	9.3	--	--
Hoopes Spring	YCT	HS-3	4.9	4.9	--	--
South Fork Sage Creek	Brown	LSS	13.2	10.7	--	--
Lower Sage Valley	Brown	LSV-2C	50.4	38.2	--	--
Lower Sage Valley	Brown	LSV-3	20.8	17.5	--	--
Lower Sage Valley	Brown	LSV-4	23.3	16.9	--	--
Lower Sage Valley	YCT	LSV-2C	35.8	35.8	--	--
Lower Sage Valley	YCT	LSV-4	12.2	11.6	--	--
Crow Creek	Brown	CC-350	16.0	16.0	--	--
Crow Creek	Brown	CC-1A	25.0	19.0	--	--
Crow Creek	YCT	CC-350	11.1	10.2	--	--
Crow Creek	YCT	CC-1A	7.3	7.3	--	--

TABLE 3-28
Tier 3 Assessment of Trout Tissue ECOPC by Drainage and Trout Species

Drainage	Species	Location	ECOPC Concentration Max[1]	Trout Tissue EPC (mg/kg dw)	Trout Tissue TRV (mg/kg dw)	HQ
Selenium						
Smoky Creek	YCT	LSm	5.3	5.3	12.48 - 14.14	0.4-0.4
Tygee Creek	YCT	LT-5	8.3	6.2	12.48 - 14.14	0.5-0.4
Sage Creek	YCT	US-4	5.6	4.8	12.48 - 14.14	0.4-0.3
Sage Creek	YCT	LS	5.1	4.2	12.48 - 14.14	0.3-0.3
Sage Creek	YCT	US	9.6	4.8	12.48 - 14.14	0.4-0.3
Hoopes Spring	Brown	HS-3	25.2	21.4	12.48 - 14.14	**2-2**
Hoopes Spring	YCT	HS-3	23.2	23.2	12.48 - 14.14	**2-2**
South Fork Sage Creek	Brown	LSS	17.5	14.0	12.48 - 14.14	1-1
Lower Sage Valley	Brown	LSV-2C	21.2	18.6	12.48 - 14.14	**2**-1
Lower Sage Valley	Brown	LSV-3	16.0	14.5	12.48 - 14.14	1-1
Lower Sage Valley	Brown	LSV-4	28.3	21.8	12.48 - 14.14	**2-2**
Lower Sage Valley	YCT	LSV-2C	17.4	17.4	12.48 - 14.14	1-1
Lower Sage Valley	YCT	LSV-4	20.4	20.1	12.48 - 14.14	**2**-1
Crow Creek	Brown	CC-350	8.3	8.3	12.48 - 14.14	0.7-0.6
Crow Creek	Brown	CC-1A	16.8	15.4	12.48 - 14.14	1-1
Crow Creek	YCT	CC-350	9.2	7.8	12.48 - 14.14	0.6-0.6
Crow Creek	YCT	CC-1A	11.0	11.0	12.48 - 14.14	0.9-0.8
Zinc						
Smoky Creek	YCT	LSm	101.1	101.1	22.5	**4**
Tygee Creek	YCT	LT-5	98.2	92.31	22.5	**4**
Sage Creek	YCT	US-4	100	92.67	22.5	**4**
Sage Creek	YCT	LS	89.3	81.91	22.5	**4**
Sage Creek	YCT	US	99.1	84.91	22.5	**4**
Hoopes Spring	Brown	HS-3	186	166.5	22.5	**7**
Hoopes Spring	YCT	HS-3	118	118	22.5	**5**
South Fork Sage Creek	Brown	LSS	205	160	22.5	**7**
Lower Sage Valley	Brown	LSV-2C	181	158.6	22.5	**7**
Lower Sage Valley	Brown	LSV-3	189	169.5	22.5	**8**
Lower Sage Valley	Brown	LSV-4	214	158.8	22.5	**7**
Lower Sage Valley	YCT	LSV-2C	119	119	22.5	**5**
Lower Sage Valley	YCT	LSV-4	105	99.7	22.5	**4**
Crow Creek	Brown	CC-350	232	232	22.5	**10**
Crow Creek	Brown	CC-1A	205	186.1	22.5	**8**
Crow Creek	YCT	CC-350	134	117.6	22.5	**5**
Crow Creek	YCT	CC-1A	76.9	76.9	22.5	**3**

Notes:

ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, HQ - Hazard Quotient, mg/kg - milligram per kilogram, TRV - Toxicity Reference Value, YCT - Yellowstone Cutthroat Trout, "--" = Not Available

1. Maximum detected concentration used for EPC value due to small sample size; In absence of detected concentrations, max non-detect values are used.

Bold = HQ > 1.0

For selenium, the range of HQs is shown based on the EPA derived EC10 and Simplot derived EC10 for the brown trout study.

TABLE 3-29
Tier 3 Assessment of Sculpin Tissue ECOPC by Drainage

Drainage	Species	Location	ECOPC Concentration Max[1]	Sculpin Tissue EPC (mg/kg dw)	Other Species Tissue TRV (mg/kg dw)	HQ
Aluminum						
Tygee Creek	sculpin	LT-5	716.0	410.3	33	**12**
Hoopes Spring	sculpin	HS-3	55.3	38.4	33	1
South Fork Sage Creek	sculpin	LSS	125.0	119.7	33	**4**
Lower Sage Valley	sculpin	LSV-2C	285.0	151.8	33	**5**
Lower Sage Valley	sculpin	LSV-3	186.0	110.0	33	**3**
Lower Sage Valley	sculpin	LSV-4	181.0	91.0	33	**3**
Crow Creek	sculpin	CC-350	272.0	190.1	33	**6**
Crow Creek	sculpin	CC-1A	330.0	258.0	33	**8**
Barium						
Tygee Creek	sculpin	LT-5	15.0	11.7	--	--
Hoopes Spring	sculpin	HS-3	4.9	4.2	--	--
South Fork Sage Creek	sculpin	LSS	6.3	6.2	--	--
Lower Sage Valley	sculpin	LSV-2C	6.1	5.2	--	--
Lower Sage Valley	sculpin	LSV-3	6.5	5.0	--	--
Lower Sage Valley	sculpin	LSV-4	6.1	5.6	--	--
Crow Creek	sculpin	CC-350	9.2	7.6	--	--
Crow Creek	sculpin	CC-1A	11.8	9.3	--	--
Cobalt						
Tygee Creek	sculpin	LT-5	0.3	0.2	--	--
Hoopes Spring	sculpin	HS-3	0.2	0.2	--	--
South Fork Sage Creek	sculpin	LSS	0.2	0.2	--	--
Lower Sage Valley	sculpin	LSV-2C	0.4	0.3	--	--
Lower Sage Valley	sculpin	LSV-3	0.2	0.2	--	--
Lower Sage Valley	sculpin	LSV-4	0.2	0.1	--	--
Crow Creek	sculpin	CC-350	0.2	0.2	--	--
Crow Creek	sculpin	CC-1A	0.2	0.2	--	--
Copper						
Tygee Creek	sculpin	LT-5	4.5	3.7	19.54	0.2
Hoopes Spring	sculpin	HS-3	2.6	2.4	19.54	0.1
South Fork Sage Creek	sculpin	LSS	2.8	2.7	19.54	0.1
Lower Sage Valley	sculpin	LSV-2C	3.7	3.1	19.54	0.2
Lower Sage Valley	sculpin	LSV-3	3.2	3.0	19.54	0.2
Lower Sage Valley	sculpin	LSV-4	3.5	3.1	19.54	0.2
Crow Creek	sculpin	CC-350	3.2	2.9	19.54	0.1
Crow Creek	sculpin	CC-1A	2.9	2.7	19.54	0.1

TABLE 3-29
Tier 3 Assessment of Sculpin Tissue ECOPC by Drainage

Drainage	Species	Location	ECOPC Concentration Max[1]	Sculpin Tissue EPC (mg/kg dw)	Other Species Tissue TRV (mg/kg dw)	HQ
Iron						
Tygee Creek	sculpin	LT-5	488.0	309.8	34.6	**9**
Hoopes Spring	sculpin	HS-3	89.0	74.9	34.6	**2**
South Fork Sage Creek	sculpin	LSS	120.0	115.9	34.6	**3**
Lower Sage Valley	sculpin	LSV-2C	276.0	166.2	34.6	**5**
Lower Sage Valley	sculpin	LSV-3	178.0	120.3	34.6	**3**
Lower Sage Valley	sculpin	LSV-4	194.0	122.1	34.6	**4**
Crow Creek	sculpin	CC-350	241.0	179.6	34.6	**5**
Crow Creek	sculpin	CC-1A	256.0	215.0	34.6	**6**
Manganese						
Tygee Creek	sculpin	LT-5	59.0	37.6	--	--
Hoopes Spring	sculpin	HS-3	23.1	12.3	--	--
South Fork Sage Creek	sculpin	LSS	13.5	13.5	--	--
Lower Sage Valley	sculpin	LSV-2C	48.5	34.6	--	--
Lower Sage Valley	sculpin	LSV-3	23.3	21.0	--	--
Lower Sage Valley	sculpin	LSV-4	25.5	20.0	--	--
Crow Creek	sculpin	CC-350	24.5	18.5	--	--
Crow Creek	sculpin	CC-1A	31.5	25.3	--	--
Selenium						
Tygee Creek	sculpin	LT-5	5.4	4.8	12.48 - 14.14	0.4-0.3
Hoopes Spring	sculpin	HS-3	20.3	18.4	12.48 - 14.14	**2**-1
South Fork Sage Creek	sculpin	LSS	17.9	17.8	12.48 - 14.14	1-1
Lower Sage Valley	sculpin	LSV-2C	26.9	21.4	12.48 - 14.14	**2-2**
Lower Sage Valley	sculpin	LSV-3	35.7	21.6	12.48 - 14.14	**2-2**
Lower Sage Valley	sculpin	LSV-4	28.0	22.6	12.48 - 14.14	**2-2**
Crow Creek	sculpin	CC-350	10.5	8.9	12.48 - 14.14	0.6-0.7
Crow Creek	sculpin	CC-1A	16.2	14.7	12.48 - 14.14	1-1
Zinc						
Tygee Creek	sculpin	LT-5	113.0	85.4	130.77	0.7
Hoopes Spring	sculpin	HS-3	74.8	66.1	130.77	0.5
South Fork Sage Creek	sculpin	LSS	68.8	68.8	130.77	0.5
Lower Sage Valley	sculpin	LSV-2C	66.6	62.6	130.77	0.5
Lower Sage Valley	sculpin	LSV-3	65.6	60.9	130.77	0.5
Lower Sage Valley	sculpin	LSV-4	87.1	70.7	130.77	0.5
Crow Creek	sculpin	CC-350	109.0	84.5	130.77	0.6
Crow Creek	sculpin	CC-1A	101.0	81.2	130.77	0.6

Notes:

ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, HQ - Hazard Quotient, mg/kg - milligram per kilogram, TRV - Toxicity Reference Value, "--" = Not Available

1. Maximum detected concentration used for EPC value due to small sample size; In absence of detected concentrations, max non-detect values are used.

Bold = HQ > 1.0

For selenium, the range of HQs is shown based on the EPA derived EC10 and Simplot derived EC10 for the brown trout study.

TABLE 3-30
Possible Range of Background Trout Tissue Concentrations of Select ECOPC

ECOPC	Species	EPC Range (mg/kg dw)	Minimum Background (mg/kg dw)	Maximum Background (mg/kg dw)
Aluminum	Trout	64.7 - 407.7	4	477
	Sculpin	38.4 - 410.3	24.8	272
Copper	Trout	2.9 - 13.5	2.61	24.3
	Sculpin	2.4 - 3.1	2.2	3.22
Iron	Trout	49 - 322	49	356
	Sculpin	75 - 309.8	64	241
Selenium	Trout	4.2 - 23.2	2.33	9.62
	Sculpin	4.8 - 22.6	3.20	10.5
Zinc	Trout	76.9 - 186.1	62.2	232
	Sculpin	60.9 - 85.4	49.9	109

Notes:

ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, mg/kg dw - milligram per kilogram dry weight

Includes tissue data from US, US-4, LS, and CC-350

TABLE 3-31
Comparison of Selenium Risk Characterization via Surface Water and Fish Tissue Concentrations

Drainage	Location	Surface Water EPC (mg/L)	Chronic Surface Water Criteria for Aquatic Life	Surface Water HQ using Criteria for Aquatic Life	Site-Specific Criteria Tissue Based	Site-Specific Criteria Tissue Based Translated to Water (mg/L)	Site-Specific Criteria HQs	Chronic ECOPC
Smoky Creek	LSm	0.004	0.005	0.8	Trout Tissue HQs = 0.3 to 0.5	0.0113	0.4	NO
Tygee Creek	LT-5	0.00042	0.005	0.1		0.0113	0.04	
Sage Creek	US, US-4, LS	0.00091	0.005	0.2		0.0113	0.1	
Roberts Creek	UR-3	0.00023	0.005	0.05	No Tissue Data	0.0113	0.02	NO
Pole Canyon Creek	LP-1	5.83	0.005	**1166**	No Tissue Data	0.0113	**516**	***YES***
Pole Canyon Creek	LP-PD	0.00037	0.005	0.1	No Tissue Data	0.0113	0.03	NO
North Fork Sage Creek and North Sage Valley	NSV-6, b,c,d,	0.012	0.005	**2**	No Tissue Data	0.0113	1	NO
Hoopes Spring	HS	0.051	0.005	**10**	Trout Tissue HQ = 2 Sculpin Tissue HQ = 2	0.0113	**5**	***YES***
Hoopes Spring	HS-2	0.040	0.005	**8**		0.0113	**4**	
Hoopes Spring	HS-3	0.042	0.005	**8**		0.0113	**4**	
Hoopes Spring	HSA1	0.017	0.005	**3**		0.0113	**2**	
Hoopes Spring	HSA2	0.013	0.005	**3**		0.0113	1	
Hoopes Spring	HSC1	0.054	0.005	**11**		0.0113	**5**	
South Fork Sage Creek	LSS	0.014	0.005	**3**	Trout Tissue HQ = 1 Sculpin Tissue HQ = 1	0.0113	1	NO
South Fork Sage Creek	LSS-2	0.013	0.005	**3**		0.0113	1	
South Fork Sage Creek	LSS-M1	0.0049	0.005	1		0.0113	0.4	
South Fork Sage Creek	LSS-M2	0.0052	0.005	1		0.0113	0.5	
Lower Sage Valley	LSV-1B	0.031	0.005	**6**	Trout Tissue HQ = 2 Sculpin Tissue HQ = 2	0.0113	**3**	***YES***
Lower Sage Valley	LSV-2A	0.029	0.005	**6**		0.0113	**3**	
Lower Sage Valley	LSV-2C	0.033	0.005	**7**		0.0113	**3**	
Lower Sage Valley	LSV-3	0.024	0.005	**5**		0.0113	**2**	
Lower Sage Valley	LSV-3a	0.022	0.005	**4**		0.0113	**2**	
Lower Sage Valley	LSV-4	0.037	0.005	**7**		0.0113	**3**	
Crow Creek	CC-1A	0.012	0.005	**2**	Trout and sculpin Tissue HQ = 1	0.0113	1	NO
Crow Creek	CC-WY-01	0.011	0.005	**2**	No Tissue Data	0.0113	1	NO

Notes:
ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, HQ - Hazard Quotient, mg/L - milligram per liter
Bold = HQ > 1.0

TABLE 3-32
Amphibian HQs by Site for Selenium in each Drainage

Drainage	Species	Location	ECOPC Concentration Max[1]	Trout Tissue EPC (mg/kg dw)	TRV_{NOEC} (mg/kg dw	TRV_{LOEC} (mg/kg dw)	HQ_{NOEC}	HQ_{LOEC}
Selenium								
Smoky Creek	YCT	LSm	5.3	5.3	20.0	24.8	0.3	0.2
Tygee Creek	YCT	LT-5	8.3	6.2	20.0	24.8	0.3	0.2
Sage Creek	YCT	US-4	5.6	4.8	20.0	24.8	0.2	0.2
Sage Creek	YCT	LS	5.1	4.2	20.0	24.8	0.2	0.2
Sage Creek	YCT	US	9.6	4.8	20.0	24.8	0.2	0.2
Hoopes Spring	Brown	HS-3	25.2	21.4	20.0	24.8	1	0.9
Hoopes Spring	YCT	HS-3	23.2	23.2	20.0	24.8	1	0.9
South Fork Sage Creek	Brown	LSS	17.5	14.0	20.0	24.8	0.7	0.6
Lower Sage Valley	Brown	LSV-2C	21.2	18.6	20.0	24.8	0.9	0.7
Lower Sage Valley	Brown	LSV-3	16.0	14.5	20.0	24.8	0.7	0.6
Lower Sage Valley	Brown	LSV-4	28.3	21.8	20.0	24.8	1	0.9
Lower Sage Valley	YCT	LSV-2C	17.4	17.4	20.0	24.8	0.9	0.7
Lower Sage Valley	YCT	LSV-4	20.4	20.1	20.0	24.8	1	0.8
Crow Creek	Brown	CC-350	8.3	8.3	20.0	24.8	0.4	0.3
Crow Creek	Brown	CC-1A	16.8	15.4	20.0	24.8	0.8	0.6
Crow Creek	YCT	CC-350	9.2	7.8	20.0	24.8	0.4	0.3
Crow Creek	YCT	CC-1A	11.0	11.0	20.0	24.8	0.6	0.4

Notes:
ECOPC - Ecological Chemical of Potential Concern, EPC - Exposure Point Concentration, TRV - Toxicity Reference Value, HQ - Hazard Quotient,
LOEC - Lowest Observed Effects Concentration, NOEC - No-Observed Effects Concentration, mg/kg dw - milligram per kilogram dry weight, YCT - Yellowstone Cutthroat Trout

1. Maximum detected concentration used for EPC value due to small sample size; In absence of detected concentrations, max non-detect values are used.

TABLE 4-1
Tier 1 Exposure Point Concentrations for Terrestrial Ecological Receptors

ECOPC	Surface Soil (mg/kg)	Surface Water (mg/L)	Vegetation (mg/kg)	Invertebrate (mg/kg)	Small Mammal (mg/kg)
Antimony	1.75E+00	2.59E-04	6.46E-02	3.16E-02	5.62E-01
Arsenic	1.33E+01	2.74E-02	3.17E-01	1.25E+00	7.96E-01
Cadmium	2.13E+01	6.23E-03	1.50E+00	5.19E+00	6.82E-01
Chromium	2.87E+02	2.72E-02	1.14E+00	3.80E+00	3.74E+00
Copper	4.58E+01	3.88E-03	7.06E+00	2.47E+01	5.51E+02
Lead	1.25E+01	8.71E-04	1.16E-01	2.67E-01	6.53E+01
Manganese	1.66E+03	2.68E-01	1.08E+02	1.31E+02	1.41E+01
Molybdenum	8.43E+00	4.94E-02	7.20E+00	3.55E+00	1.27E+00
Nickel	1.12E+02	7.54E-02	4.27E+00	2.92E+00	1.00E+01
Selenium	2.07E+01	5.12E-01	1.95E+01	2.31E+01	2.87E+01
Vanadium	1.75E+02	2.13E-02	4.05E-01	2.16E+00	1.54E+00
Zinc	5.00E+02	2.57E-01	5.69E+01	1.87E+02	8.61E+02

Notes:
Exposure Point Concentrations (EPCs) shown in the table represent sitewide 95UCLs calculated by ProUCL v 5.0.
ECOPC - Ecological Chemical of Potential Concern
mg/kg - milligram per kilogram
mg/L - milligram per liter

TABLE 4-2
Tier 1 Surface Soil Exposure Point Concentrations for Plant and Invertebrate ECOPCs

ECOPC	Surface Soil (mg/kg)
Barium	1.41E+02
Boron	2.88E+01
Cobalt	7.42E+00
Mercury	1.45E-01
Thallium	7.09E-01
Uranium	2.01E+01

Notes:

EPCs shown in the table represent sitewide 95UCLs calculated by ProUCL v 5.0.

ECOPC - Ecological Chemical of Potential Concern
mg/kg - milligram per kilogram

TABLE 4-3
Tier 1 Site-Wide Exposure Estimates for Terrestrial Ecological Receptors

ECOPC	Receptor	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
Antimony	Coyote	1.68E-02	1.57E-03	2.02E-05	1.84E-02
	Deer Mouse	1.04E-02	5.60E-03	3.78E-05	1.60E-02
	Eastern Cottontail	3.94E-03	2.62E-03	2.51E-05	6.59E-03
	Mule Deer	2.58E-03	5.25E-04	1.71E-05	3.13E-03
Arsenic	American Robin	1.65E-01	3.59E-02	3.78E-03	2.05E-01
	Coyote	2.65E-02	1.20E-02	2.14E-03	4.06E-02
	Deer Mouse	1.56E-01	4.25E-02	4.00E-03	2.03E-01
	Eastern Cottontail	1.93E-02	1.99E-02	2.66E-03	4.19E-02
	Mule Deer	1.27E-02	3.99E-03	1.81E-03	1.85E-02
	Northern Bobwhite	4.29E-02	2.53E-02	2.79E-03	7.10E-02
	Northern Harrier	8.07E-02	9.30E-03	2.03E-03	9.21E-02
Cadmium	American Robin	7.03E-01	5.76E-02	8.60E-04	7.61E-01
	Coyote	3.25E-02	1.92E-02	4.86E-04	5.22E-02
	Deer Mouse	6.68E-01	6.83E-02	9.10E-04	7.37E-01
	Eastern Cottontail	9.15E-02	3.20E-02	6.04E-04	1.24E-01
	Mule Deer	6.00E-02	6.40E-03	4.11E-04	6.68E-02
	Northern Bobwhite	1.93E-01	4.05E-02	6.35E-04	2.34E-01
	Northern Harrier	7.95E-02	1.49E-02	4.61E-04	9.49E-02
Chromium	American Robin	5.18E-01	7.76E-01	3.75E-03	1.30E+00
	Coyote	1.20E-01	2.59E-01	2.12E-03	3.81E-01
	Deer Mouse	4.93E-01	9.19E-01	3.97E-03	1.42E+00
	Eastern Cottontail	6.96E-02	4.31E-01	2.64E-03	5.03E-01
	Mule Deer	4.56E-02	8.62E-02	1.80E-03	1.34E-01
	Northern Bobwhite	1.45E-01	5.46E-01	2.77E-03	6.93E-01
	Northern Harrier	3.74E-01	2.01E-01	2.01E-03	5.78E-01
Copper	American Robin	3.33E+00	1.24E-01	5.35E-04	3.45E+00
	Coyote	1.64E+01	4.12E-02	3.03E-04	1.65E+01
	Deer Mouse	3.16E+00	1.47E-01	5.66E-04	3.31E+00
	Eastern Cottontail	4.31E-01	6.87E-02	3.76E-04	5.00E-01
	Mule Deer	2.82E-01	1.37E-02	2.56E-04	2.96E-01
	Northern Bobwhite	9.11E-01	8.70E-02	3.96E-04	9.99E-01
	Northern Harrier	5.38E+01	3.21E-02	2.87E-04	5.38E+01
Lead	American Robin	4.02E-02	3.36E-02	1.20E-04	7.40E-02
	Coyote	1.94E+00	1.12E-02	6.79E-05	1.95E+00
	Deer Mouse	3.88E-02	3.99E-02	1.27E-04	7.88E-02
	Eastern Cottontail	7.08E-03	1.87E-02	8.45E-05	2.59E-02
	Mule Deer	4.64E-03	3.74E-03	5.75E-05	8.44E-03
	Northern Bobwhite	1.31E-02	2.37E-02	8.88E-05	3.68E-02
	Northern Harrier	6.37E+00	8.72E-03	6.45E-05	6.38E+00

TABLE 4-3
Tier 1 Site-Wide Exposure Estimates for Terrestrial Ecological Receptors

ECOPC	Receptor	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
Manganese	American Robin	2.51E+01	4.47E+00	3.70E-02	2.96E+01
	Coyote	8.21E-01	1.49E+00	2.09E-02	2.33E+00
	Deer Mouse	2.49E+01	5.30E+00	3.91E-02	3.02E+01
	Eastern Cottontail	6.61E+00	2.48E+00	2.60E-02	9.11E+00
	Mule Deer	4.33E+00	4.97E-01	1.77E-02	4.85E+00
	Northern Bobwhite	1.06E+01	3.14E+00	2.73E-02	1.38E+01
	Northern Harrier	1.70E+00	1.16E+00	1.98E-02	2.88E+00
Molybdenum	American Robin	1.13E+00	2.28E-02	6.82E-03	1.16E+00
	Coyote	5.42E-02	7.58E-03	3.85E-03	6.56E-02
	Deer Mouse	1.16E+00	2.70E-02	7.21E-03	1.20E+00
	Eastern Cottontail	4.39E-01	1.26E-02	4.79E-03	4.56E-01
	Mule Deer	2.88E-01	2.53E-03	3.26E-03	2.94E-01
	Northern Bobwhite	6.34E-01	1.60E-02	5.04E-03	6.55E-01
	Northern Harrier	1.33E-01	5.90E-03	3.66E-03	1.42E-01
Nickel	American Robin	7.56E-01	3.02E-01	1.04E-02	1.07E+00
	Coyote	3.10E-01	1.01E-01	5.88E-03	4.16E-01
	Deer Mouse	7.68E-01	3.58E-01	1.10E-02	1.14E+00
	Eastern Cottontail	2.61E-01	1.68E-01	7.31E-03	4.36E-01
	Mule Deer	1.71E-01	3.36E-02	4.98E-03	2.09E-01
	Northern Bobwhite	3.87E-01	2.13E-01	7.69E-03	6.08E-01
	Northern Harrier	9.86E-01	7.84E-02	5.58E-03	1.07E+00
Selenium	American Robin	4.47E+00	5.60E-02	7.07E-02	4.60E+00
	Coyote	9.24E-01	1.87E-02	3.99E-02	9.82E-01
	Deer Mouse	4.44E+00	6.63E-02	7.48E-02	4.58E+00
	Eastern Cottontail	1.19E+00	3.11E-02	4.97E-02	1.27E+00
	Mule Deer	7.80E-01	6.22E-03	3.38E-02	8.20E-01
	Northern Bobwhite	1.90E+00	3.94E-02	5.22E-02	1.99E+00
	Northern Harrier	2.86E+00	1.45E-02	3.79E-02	2.91E+00
Vanadium	American Robin	2.69E-01	4.71E-01	2.94E-03	7.43E-01
	Coyote	5.05E-02	1.57E-01	1.66E-03	2.09E-01
	Deer Mouse	2.52E-01	5.59E-01	3.11E-03	8.14E-01
	Eastern Cottontail	2.47E-02	2.62E-01	2.07E-03	2.89E-01
	Mule Deer	1.62E-02	5.24E-02	1.41E-03	7.00E-02
	Northern Bobwhite	6.24E-02	3.32E-01	2.17E-03	3.96E-01
	Northern Harrier	1.55E-01	1.22E-01	1.58E-03	2.79E-01
Zinc	American Robin	2.56E+01	1.35E+00	3.55E-02	2.70E+01
	Coyote	2.60E+01	4.50E-01	2.00E-02	2.65E+01
	Deer Mouse	2.44E+01	1.60E+00	3.75E-02	2.60E+01
	Eastern Cottontail	3.47E+00	7.50E-01	2.49E-02	4.24E+00
	Mule Deer	2.27E+00	1.50E-01	1.70E-02	2.44E+00
	Northern Bobwhite	7.18E+00	9.50E-01	2.62E-02	8.16E+00
	Northern Harrier	8.45E+01	3.50E-01	1.90E-02	8.48E+01

Notes:
ECOPC - Ecological Chemical of Potential Concern
mg/kg BW/day - milligram per kilogram of body weight per day

TABLE 4-4
Tier 2 Exposure Point Concentrations for Panel-Based Exposure Domains

Location	ECOPC	Soil (mg/kg)	Surface Water (mg/L)	Terrestrial Vegetation (mg/kg)	Terrestrial Invertebrates (mg/kg)	Small Mammals (mg/kg)
A Panel Area 1	Antimony	7.05E-01	1.52E-03	1.05E-01	2.81E-02	8.17E-01
	Arsenic	7.78E+00	3.03E-01	7.43E-02	3.42E-01	4.05E-01
	Cadmium	1.43E+01	3.26E-02	1.03E+00	6.32E+00	1.23E+00
	Chromium	1.53E+02	1.04E-01	7.24E-01	4.11E+00	2.53E+00
	Copper	3.84E+01	2.32E-02	7.70E+00	2.42E+01	5.98E+02
	Lead	1.31E+01	7.10E-03	9.04E-01	3.29E-01	2.30E+02
	Manganese	1.89E+03	1.25E+00	1.51E+02	1.62E+02	1.30E+01
	Molybdenum	4.37E+00	3.06E-01	6.11E+00	2.35E+00	1.25E+00
	Nickel	6.99E+01	5.34E-01	2.45E+00	2.67E+00	3.31E+01
	Selenium	3.30E+00	6.62E+00	8.30E-01	3.18E+00	1.41E+01
	Vanadium	1.68E+02	9.66E-02	4.94E-01	3.32E+00	1.30E+00
	Zinc	3.17E+02	1.60E+00	3.83E+01	1.94E+02	6.09E+02
A Panel Area 2	Antimony	3.30E+00	1.52E-03	1.02E-01	9.70E-02	5.91E-01
	Arsenic	2.75E+01	3.03E-01	6.04E-01	9.30E-01	7.51E-01
	Cadmium	3.95E+01	3.26E-02	4.30E+00	8.10E+00	1.09E+00
	Chromium	5.04E+02	1.04E-01	8.76E-01	4.46E+00	9.75E+00
	Copper	8.49E+01	2.32E-02	9.33E+00	2.72E+01	1.93E+02
	Lead	1.19E+01	7.10E-03	3.82E-01	2.11E-01	1.14E+01
	Manganese	2.10E+03	1.25E+00	6.20E+01	1.03E+02	3.63E+01
	Molybdenum	2.02E+01	3.06E-01	1.56E+01	4.59E+00	1.59E+00
	Nickel	2.02E+02	5.34E-01	8.62E+00	4.72E+00	1.50E+01
	Selenium	1.21E+02	6.62E+00	3.94E+01	2.29E+01	2.10E+01
	Vanadium	2.89E+02	9.66E-02	7.57E-01	3.18E+00	3.71E+00
	Zinc	8.23E+02	1.60E+00	1.05E+02	2.40E+02	1.07E+03
D Panel North	Antimony	1.75E+00	1.52E-03	1.85E-01	5.11E-02	3.30E-01
	Arsenic	1.44E+01	3.03E-01	5.62E-01	1.51E+00	1.77E+00
	Cadmium	2.61E+01	3.26E-02	2.20E+00	7.99E+00	6.99E-01
	Chromium	3.71E+02	1.04E-01	1.90E+00	4.77E+00	2.39E+00
	Copper	5.53E+01	2.32E-02	7.40E+00	2.69E+01	5.48E+02
	Lead	9.96E+00	7.10E-03	2.34E-01	2.96E-01	2.11E+01
	Manganese	1.62E+03	1.25E+00	5.86E+01	1.06E+02	9.99E+00
	Molybdenum	1.19E+01	3.06E-01	1.10E+01	8.77E+00	1.74E+00
	Nickel	1.31E+02	5.34E-01	5.37E+00	4.54E+00	3.98E+00
	Selenium	2.71E+01	6.62E+00	2.91E+01	5.14E+01	4.91E+01
	Vanadium	2.33E+02	9.66E-02	4.89E-01	5.60E+00	1.04E+00
	Zinc	6.04E+02	1.60E+00	6.66E+01	2.12E+02	7.06E+02

TABLE 4-4
Tier 2 Exposure Point Concentrations for Panel-Based Exposure Domains

Location	ECOPC	Soil (mg/kg)	Surface Water (mg/L)	Terrestrial Vegetation (mg/kg)	Terrestrial Invertebrates (mg/kg)	Small Mammals (mg/kg)
D Panel South	Antimony	2.68E+00	1.52E-03	9.89E-02	4.10E-02	3.65E-01
	Arsenic	1.50E+01	3.03E-01	4.72E-01	1.43E+00	1.14E+00
	Cadmium	3.51E+01	3.26E-02	1.19E+00	5.33E+00	5.59E-01
	Chromium	4.28E+02	1.04E-01	9.81E-01	6.03E+00	5.68E+00
	Copper	7.03E+01	2.32E-02	6.79E+00	2.46E+01	9.61E+02
	Lead	1.15E+01	7.10E-03	1.02E-01	1.86E-01	5.53E+01
	Manganese	1.58E+03	1.25E+00	1.02E+02	1.48E+02	3.04E+01
	Molybdenum	1.37E+01	3.06E-01	1.02E+01	6.39E+00	1.38E+00
	Nickel	1.42E+02	5.34E-01	3.97E+00	4.18E+00	1.05E+01
	Selenium	1.90E+01	6.62E+00	2.06E+01	3.89E+01	3.76E+01
	Vanadium	2.92E+02	9.66E-02	4.58E-01	3.44E+00	2.37E+00
	Zinc	6.54E+02	1.60E+00	4.99E+01	1.84E+02	1.12E+03
E Panel Area 1	Antimony	5.03E-01	1.52E-03	9.95E-03	8.30E-02	7.65E-01
	Arsenic	7.99E+00	3.03E-01	1.46E-01	5.75E-01	2.48E-01
	Cadmium	1.31E+01	3.26E-02	7.17E-01	1.74E+01	1.84E+00
	Chromium	2.11E+02	1.04E-01	3.08E+00	1.39E+01	3.05E+00
	Copper	4.00E+01	2.32E-02	6.57E+00	2.94E+01	3.87E+02
	Lead	1.42E+01	7.10E-03	1.55E-01	4.10E-01	1.53E+02
	Manganese	2.82E+03	1.25E+00	1.39E+02	2.02E+02	1.35E+01
	Molybdenum	8.67E+00	3.06E-01	7.80E+00	3.10E+00	1.43E+00
	Nickel	8.38E+01	5.34E-01	3.52E+00	4.35E+00	2.77E+00
	Selenium	3.05E+00	6.62E+00	1.91E+00	4.38E+00	3.71E+00
	Vanadium	1.06E+02	9.66E-02	6.35E-01	5.01E+00	1.09E+00
	Zinc	3.45E+02	1.60E+00	3.08E+01	2.05E+02	5.94E+02
E Panel Area 2	Antimony	9.43E-02	1.52E-03	8.16E-02	2.00E-02	5.36E-01
	Arsenic	4.54E+00	3.03E-01	9.67E-02	2.61E-01	1.23E+00
	Cadmium	6.37E+00	3.26E-02	3.36E-01	2.02E+00	2.20E-01
	Chromium	4.58E+01	1.04E-01	1.35E+00	1.22E+00	2.53E+00
	Copper	2.66E+01	2.32E-02	5.22E+00	2.33E+01	3.65E+02
	Lead	1.63E+01	7.10E-03	2.49E-01	2.28E-01	5.09E+01
	Manganese	3.35E+03	1.25E+00	1.48E+02	2.47E+02	1.52E+01
	Molybdenum	1.70E+00	3.06E-01	4.53E+00	1.62E+00	1.18E+00
	Nickel	3.90E+01	5.34E-01	1.29E+00	1.69E+00	2.38E+00
	Selenium	4.99E-01	6.62E+00	2.08E-01	6.45E+00	2.39E+00
	Vanadium	4.07E+01	9.66E-02	4.06E-01	7.91E-01	8.88E-01
	Zinc	1.23E+02	1.60E+00	2.11E+01	1.63E+02	4.27E+02

TABLE 4-4
Tier 2 Exposure Point Concentrations for Panel-Based Exposure Domains

Location	ECOPC	Soil (mg/kg)	Surface Water (mg/L)	Terrestrial Vegetation (mg/kg)	Terrestrial Invertebrates (mg/kg)	Small Mammals (mg/kg)
North Sage Valley	Antimony	1.36E-01	1.52E-03	3.00E-02	1.00E+00	4.90E-01
	Arsenic	5.01E+00	3.03E-01	6.80E-02	3.18E-01	2.25E-01
	Cadmium	4.46E+00	3.26E-02	3.32E-01	3.03E+00	4.17E-01
	Chromium	4.35E+01	1.04E-01	1.17E+00	5.41E-01	2.73E+00
	Copper	2.86E+01	2.32E-02	9.60E+00	2.66E+01	5.07E+02
	Lead	1.70E+01	7.10E-03	1.36E-01	2.03E-01	1.94E+01
	Manganese	1.54E+03	1.25E+00	1.25E+02	2.31E+02	4.42E+01
	Molybdenum	1.11E+00	3.06E-01	2.61E+00	1.38E+00	1.26E+00
	Nickel	2.58E+01	5.34E-01	9.79E-01	1.53E+00	5.43E+00
	Selenium	6.24E-01	6.62E+00	1.40E+00	8.83E+00	2.69E+00
	Vanadium	4.54E+01	9.66E-02	2.21E-01	4.32E-01	9.41E-01
	Zinc	1.69E+02	1.60E+00	3.15E+01	1.62E+02	1.48E+03
Pole Canyon ODA	Antimony	2.61E+00	1.52E-03	3.40E-02	1.00E+00	1.12E+00
	Arsenic	1.88E+01	3.03E-01	3.08E-01	1.07E+00	1.73E+00
	Cadmium	3.33E+01	3.26E-02	2.14E+00	8.15E+00	9.32E-01
	Chromium	4.89E+02	1.04E-01	2.52E+00	2.40E+00	3.84E+00
	Copper	7.15E+01	2.32E-02	8.12E+00	2.72E+01	4.10E+03
	Lead	1.17E+01	7.10E-03	1.01E-01	1.36E-01	2.32E+02
	Manganese	1.99E+03	1.25E+00	1.14E+02	8.93E+01	1.03E+01
	Molybdenum	1.66E+01	3.06E-01	1.19E+01	5.80E+00	1.54E+00
	Nickel	1.83E+02	5.34E-01	9.47E+00	4.22E+00	3.22E+01
	Selenium	2.43E+01	6.62E+00	1.44E+01	2.88E+01	5.61E+01
	Vanadium	2.41E+02	9.66E-02	3.68E-01	1.30E+00	1.62E+00
	Zinc	8.61E+02	1.60E+00	7.84E+01	2.36E+02	1.50E+03

Notes:

ECOPC was not detected. The highest detection limit was used as the EPC.

ECOPC - Ecological Chemical of Potential Concern

mg/kg - milligram per kilogram

mg/L - milligram per liter

ODA - Overburden Disposal Area

TABLE 4-5
Tier 2 Exposure Point Concentrations By Reclamation Type

Location	ECOPC	Soil (mg/kg)	Surface Water (mg/L)	Terrestrial Vegetation (mg/kg)	Terrestrial Invertebrates (mg/kg)	Small Mammals (mg/kg)
Dinwoody Chert	Antimony	0.0956	N/A	0.0816	0.02	0.536
	Arsenic	4.536	N/A	0.0967	0.261	1.372
	Barium	223.7	N/A	ECOPC for Plants/Invertebrates Only		
	Boron	22.74	N/A	ECOPC for Plants/Invertebrates Only		
	Cadmium	6.371	N/A	0.336	2.022	0.22
	Cobalt	11.93	N/A	ECOPC for Plants/Invertebrates Only		
	Copper	26.59	N/A	5.215	23.28	365.3
	Lead	16.32	N/A	0.249	0.228	50.93
	Manganese	3353	N/A	148	247	2.376
	Mercury	0.038	N/A	ECOPC for Plants/Invertebrates Only		
	Molybdenum	1.702	N/A	4.53	1.623	1.178
	Nickel	38.99	N/A	1.293	1.685	2.376
	Selenium	0.499	N/A	0.208	6.446	2.39
	Thallium	0.282	N/A	ECOPC for Plants/Invertebrates Only		
	Uranium	4.075	N/A	ECOPC for Plants/Invertebrates Only		
	Vanadium	40.68	N/A	0.406	0.791	0.888
	Zinc	123.2	N/A	21.09	162.6	426.8
No Topsoil/No Chert	Antimony	3.222	N/A	0.0488	0.051	1.209
	Arsenic	20.2	N/A	0.552	1.8	1.62
	Barium	92.26	N/A	ECOPC for Plants/Invertebrates Only		
	Boron	42.05	N/A	ECOPC for Plants/Invertebrates Only		
	Cadmium	39.08	N/A	2.816	7.079	0.963
	Copper	83.59	N/A	9.464	29.4	487.3
	Cobalt	6.245	N/A	ECOPC for Plants/Invertebrates Only		
	Lead	10.9	N/A	0.194	0.288	524.8
	Manganese	1677	N/A	49.43	104	10.5
	Mercury	0.36	N/A	ECOPC for Plants/Invertebrates Only		
	Molybdenum	19.85	N/A	14.71	6.49	1.561
	Nickel	200.4	N/A	5.889	5.88	14.78
	Selenium	25.65	N/A	29.58	55.12	47.81
	Thallium	1.226	N/A	ECOPC for Plants/Invertebrates Only		
	Uranium	48.15	N/A	ECOPC for Plants/Invertebrates Only		
	Vanadium	394.9	N/A	0.417	4.45	2.546
	Zinc	913.2	N/A	87.32	203.8	904.9

TABLE 4-5
Tier 2 Exposure Point Concentrations By Reclamation Type

Location	ECOPC	Soil (mg/kg)	Surface Water (mg/L)	Terrestrial Vegetation (mg/kg)	Terrestrial Invertebrates (mg/kg)	Small Mammals (mg/kg)
Topsoil Over Chert	Antimony	1.757	N/A	0.0668	0.034	0.481
	Arsenic	9.856	N/A	0.235	0.8	0.838
	Barium	137.1	N/A	ECOPC for Plants/Invertebrates Only		
	Boron	28.06	N/A	ECOPC for Plants/Invertebrates Only		
	Cadmium	20.36	N/A	0.915	5.94	0.954
	Copper	45.44	N/A	6.812	24.88	567.1
	Cobalt	7.741	N/A	ECOPC for Plants/Invertebrates Only		
	Lead	12.29	N/A	0.091	0.268	83.34
	Manganese	1607	N/A	120.2	152.8	15.16
	Mercury	0.147	N/A	ECOPC for Plants/Invertebrates Only		
	Molybdenum	8.492	N/A	6.929	3.9	1.309
	Nickel	92.57	N/A	3.018	3.4	14.15
	Selenium	7.998	N/A	8.29	25.42	25.74
	Thallium	0.649	N/A	ECOPC for Plants/Invertebrates Only		
	Uranium	17.32	N/A	ECOPC for Plants/Invertebrates Only		
	Vanadium	179.1	N/A	0.485	3.22	1.245
	Zinc	417.9	N/A	38.32	183.3	672.7
Topsoil Only	Antimony	2.808	N/A	0.109	0.0516	0.453
	Arsenic	19.04	N/A	0.43	1.035	1.372
	Barium	110	N/A	ECOPC for Plants/Invertebrates Only		
	Boron	42.28	N/A	ECOPC for Plants/Invertebrates Only		
	Cadmium	27.8	N/A	2.34	7.646	0.827
	Copper	62.49	N/A	7.646	25.73	1341
	Cobalt	6.376	N/A	ECOPC for Plants/Invertebrates Only		
	Lead	10.79	N/A	0.243	0.15	36.91
	Manganese	1596	N/A	70.26	93.13	21.77
	Mercury	0.241	N/A	ECOPC for Plants/Invertebrates Only		
	Molybdenum	13.88	N/A	11.42	6.347	1.574
	Nickel	151.9	N/A	7.73	3.213	19.4
	Selenium	74.07	N/A	27.46	29.77	42.47
	Thallium	0.822	N/A	ECOPC for Plants/Invertebrates Only		
	Uranium	28	N/A	ECOPC for Plants/Invertebrates Only		
	Vanadium	200.9	N/A	0.563	2.043	2.061
	Zinc	654.2	N/A	78.58	225.4	969.4

Notes:

Maximum detect/dection limit used due to small number of detects or small dataset (i.e. < 5 samples).

Surface water not evaluated since no significant surface water sources are available in the reclaimed areas.

ECOPC - Ecological Chemical of Potential Concern

mg/kg - milligram per kilogram

mg/L - milligram per liter

TABLE 4-6
Tier 2 Exposure Estimates
Panel A Area 1

Receptor	ECOPC	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
American Robin	Antimony	1.40E-02	1.90E-03	2.10E-04	1.61E-02
	Arsenic	4.37E-02	2.10E-02	4.18E-02	1.07E-01
	Cadmium	7.72E-01	3.86E-02	4.50E-03	8.15E-01
	Chromium	5.08E-01	4.13E-01	1.44E-02	9.34E-01
	Copper	3.35E+00	1.04E-01	3.20E-03	3.46E+00
	Lead	1.29E-01	3.53E-02	9.80E-04	1.66E-01
	Manganese	3.28E+01	5.11E+00	1.73E-01	3.81E+01
	Molybdenum	8.89E-01	1.18E-02	4.22E-02	9.43E-01
	Nickel	5.37E-01	1.89E-01	7.37E-02	8.00E-01
	Selenium	4.21E-01	8.91E-03	9.14E-01	1.34E+00
	Vanadium	4.00E-01	4.52E-01	1.33E-02	8.66E-01
	Zinc	2.43E+01	8.56E-01	2.21E-01	2.54E+01
Coyote	Antimony	2.45E-02	6.35E-04	1.19E-04	2.52E-02
	Arsenic	1.28E-02	7.00E-03	2.36E-02	4.34E-02
	Cadmium	5.03E-02	1.29E-02	2.54E-03	6.57E-02
	Chromium	8.41E-02	1.38E-01	8.11E-03	2.30E-01
	Copper	1.78E+01	3.45E-02	1.81E-03	1.78E+01
	Lead	6.84E+00	1.18E-02	5.54E-04	6.85E+00
	Manganese	9.05E-01	1.70E+00	9.75E-02	2.71E+00
	Molybdenum	4.99E-02	3.93E-03	2.39E-02	7.77E-02
	Nickel	9.93E-01	6.29E-02	4.17E-02	1.10E+00
	Selenium	4.27E-01	2.97E-03	5.16E-01	9.46E-01
	Vanadium	4.59E-02	1.51E-01	7.53E-03	2.04E-01
	Zinc	1.85E+01	2.85E-01	1.25E-01	1.89E+01
Deer Mouse	Antimony	1.47E-02	2.26E-03	2.22E-04	1.72E-02
	Arsenic	4.12E-02	2.49E-02	4.42E-02	1.10E-01
	Cadmium	7.22E-01	4.57E-02	4.76E-03	7.72E-01
	Chromium	4.76E-01	4.89E-01	1.52E-02	9.80E-01
	Copper	3.20E+00	1.23E-01	3.39E-03	3.32E+00
	Lead	1.35E-01	4.18E-02	1.04E-03	1.78E-01
	Manganese	3.27E+01	6.06E+00	1.83E-01	3.90E+01
	Molybdenum	9.24E-01	1.40E-02	4.47E-02	9.83E-01
	Nickel	5.35E-01	2.24E-01	7.80E-02	8.37E-01
	Selenium	3.99E-01	1.06E-02	9.67E-01	1.38E+00
	Vanadium	3.74E-01	5.36E-01	1.41E-02	9.24E-01
	Zinc	2.29E+01	1.01E+00	2.34E-01	2.41E+01
Eastern Cottontail	Antimony	6.41E-03	1.06E-03	1.47E-04	7.61E-03
	Arsenic	4.53E-03	1.17E-02	2.94E-02	4.56E-02
	Cadmium	6.27E-02	2.14E-02	3.16E-03	8.73E-02
	Chromium	4.42E-02	2.29E-01	1.01E-02	2.83E-01
	Copper	4.70E-01	5.76E-02	2.25E-03	5.29E-01
	Lead	5.51E-02	1.96E-02	6.89E-04	7.54E-02
	Manganese	9.20E+00	2.84E+00	1.21E-01	1.22E+01
	Molybdenum	3.73E-01	6.55E-03	2.97E-02	4.09E-01
	Nickel	1.49E-01	1.05E-01	5.18E-02	3.06E-01
	Selenium	5.06E-02	4.95E-03	6.42E-01	6.98E-01
	Vanadium	3.01E-02	2.51E-01	9.37E-03	2.91E-01
	Zinc	2.33E+00	4.75E-01	1.55E-01	2.96E+00

TABLE 4-6
Tier 2 Exposure Estimates
Panel A Area 1

Receptor	ECOPC	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
Mule Deer	Antimony	4.20E-03	2.12E-04	1.00E-04	4.51E-03
	Arsenic	2.97E-03	2.33E-03	2.00E-02	2.53E-02
	Cadmium	4.11E-02	4.29E-03	2.15E-03	4.76E-02
	Chromium	2.90E-02	4.58E-02	6.86E-03	8.17E-02
	Copper	3.08E-01	1.15E-02	1.53E-03	3.21E-01
	Lead	3.62E-02	3.92E-03	4.69E-04	4.05E-02
	Manganese	6.04E+00	5.68E-01	8.25E-02	6.69E+00
	Molybdenum	2.44E-01	1.31E-03	2.02E-02	2.66E-01
	Nickel	9.78E-02	2.10E-02	3.52E-02	1.54E-01
	Selenium	3.32E-02	9.90E-04	4.37E-01	4.71E-01
	Vanadium	1.98E-02	5.03E-02	6.38E-03	7.64E-02
	Zinc	1.53E+00	9.51E-02	1.06E-01	1.73E+00
Northern Bobwhite	Antimony	8.92E-03	1.34E-03	1.55E-04	1.04E-02
	Arsenic	1.07E-02	1.48E-02	3.09E-02	5.64E-02
	Cadmium	1.70E-01	2.72E-02	3.33E-03	2.01E-01
	Chromium	1.15E-01	2.90E-01	1.06E-02	4.16E-01
	Copper	9.57E-01	7.29E-02	2.37E-03	1.03E+00
	Lead	7.80E-02	2.48E-02	7.24E-04	1.04E-01
	Manganese	1.45E+01	3.60E+00	1.28E-01	1.82E+01
	Molybdenum	5.29E-01	8.30E-03	3.12E-02	5.69E-01
	Nickel	2.35E-01	1.33E-01	5.45E-02	4.23E-01
	Selenium	1.11E-01	6.27E-03	6.75E-01	7.93E-01
	Vanadium	8.56E-02	3.18E-01	9.85E-03	4.14E-01
	Zinc	5.76E+00	6.02E-01	1.63E-01	6.53E+00
Northern Harrier	Antimony	7.97E-02	4.94E-04	1.12E-04	8.03E-02
	Arsenic	4.03E-02	5.45E-03	2.24E-02	6.82E-02
	Cadmium	1.36E-01	1.00E-02	2.41E-03	1.48E-01
	Chromium	2.56E-01	1.07E-01	7.70E-03	3.71E-01
	Copper	5.83E+01	2.69E-02	1.72E-03	5.84E+01
	Lead	2.25E+01	9.15E-03	5.25E-04	2.25E+01
	Manganese	1.67E+00	1.33E+00	9.25E-02	3.09E+00
	Molybdenum	1.28E-01	3.06E-03	2.26E-02	1.54E-01
	Nickel	3.24E+00	4.90E-02	3.95E-02	3.33E+00
	Selenium	1.39E+00	2.31E-03	4.90E-01	1.88E+00
	Vanadium	1.35E-01	1.17E-01	7.15E-03	2.60E-01
	Zinc	5.99E+01	2.22E-01	1.18E-01	6.02E+01

Notes:

ECOPC - Ecological Chemical of Potential Concern

mg/kg BW/day - milligram per kilogram of body weight per day

TABLE 4-7
Tier 2 Exposure Estimates
Panel A Area 2

Receptor	ECOPC	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
American Robin	Antimony	2.09E-02	8.91E-03	2.10E-04	3.00E-02
	Arsenic	1.61E-01	7.43E-02	4.18E-02	2.77E-01
	Cadmium	1.30E+00	1.07E-01	4.50E-03	1.41E+00
	Chromium	5.61E-01	1.36E+00	1.44E-02	1.94E+00
	Copper	3.83E+00	2.29E-01	3.20E-03	4.07E+00
	Lead	6.23E-02	3.20E-02	9.80E-04	9.53E-02
	Manganese	1.74E+01	5.68E+00	1.73E-01	2.32E+01
	Molybdenum	2.12E+00	5.44E-02	4.22E-02	2.21E+00
	Nickel	1.40E+00	5.44E-01	7.37E-02	2.02E+00
	Selenium	6.54E+00	3.27E-01	9.14E-01	7.78E+00
	Vanadium	4.13E-01	7.81E-01	1.33E-02	1.21E+00
	Zinc	3.62E+01	2.22E+00	2.21E-01	3.87E+01
Coyote	Antimony	1.79E-02	2.97E-03	1.19E-04	2.10E-02
	Arsenic	2.49E-02	2.48E-02	2.36E-02	7.33E-02
	Cadmium	5.39E-02	3.56E-02	2.54E-03	9.21E-02
	Chromium	3.00E-01	4.54E-01	8.11E-03	7.62E-01
	Copper	5.81E+00	7.64E-02	1.81E-03	5.89E+00
	Lead	3.40E-01	1.07E-02	5.54E-04	3.51E-01
	Manganese	1.36E+00	1.89E+00	9.75E-02	3.35E+00
	Molybdenum	7.67E-02	1.81E-02	2.39E-02	1.19E-01
	Nickel	4.67E-01	1.81E-01	4.17E-02	6.90E-01
	Selenium	7.20E-01	1.09E-01	5.16E-01	1.34E+00
	Vanadium	1.17E-01	2.60E-01	7.53E-03	3.85E-01
	Zinc	3.23E+01	7.40E-01	1.25E-01	3.32E+01
Deer Mouse	Antimony	2.09E-02	1.06E-02	2.22E-04	3.17E-02
	Arsenic	1.58E-01	8.81E-02	4.42E-02	2.90E-01
	Cadmium	1.27E+00	1.26E-01	4.76E-03	1.40E+00
	Chromium	5.27E-01	1.61E+00	1.52E-02	2.16E+00
	Copper	3.67E+00	2.72E-01	3.39E-03	3.94E+00
	Lead	6.39E-02	3.80E-02	1.04E-03	1.03E-01
	Manganese	1.70E+01	6.73E+00	1.83E-01	2.39E+01
	Molybdenum	2.22E+00	6.45E-02	4.47E-02	2.33E+00
	Nickel	1.44E+00	6.45E-01	7.80E-02	2.16E+00
	Selenium	6.70E+00	3.87E-01	9.67E-01	8.05E+00
	Vanadium	3.90E-01	9.25E-01	1.41E-02	1.33E+00
	Zinc	3.49E+01	2.63E+00	2.34E-01	3.78E+01
Eastern Cottontail	Antimony	6.22E-03	4.95E-03	1.47E-04	1.13E-02
	Arsenic	3.68E-02	4.13E-02	2.94E-02	1.08E-01
	Cadmium	2.62E-01	5.93E-02	3.16E-03	3.25E-01
	Chromium	5.34E-02	7.56E-01	1.01E-02	8.20E-01
	Copper	5.69E-01	1.27E-01	2.25E-03	6.99E-01
	Lead	2.33E-02	1.78E-02	6.89E-04	4.18E-02
	Manganese	3.78E+00	3.15E+00	1.21E-01	7.06E+00
	Molybdenum	9.50E-01	3.02E-02	2.97E-02	1.01E+00
	Nickel	5.26E-01	3.02E-01	5.18E-02	8.80E-01
	Selenium	2.40E+00	1.82E-01	6.42E-01	3.23E+00
	Vanadium	4.62E-02	4.34E-01	9.37E-03	4.89E-01
	Zinc	6.42E+00	1.23E+00	1.55E-01	7.81E+00

TABLE 4-7
Tier 2 Exposure Estimates
Panel A Area 2

Receptor	ECOPC	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
Mule Deer	Antimony	4.08E-03	9.90E-04	1.00E-04	5.17E-03
	Arsenic	2.42E-02	8.26E-03	2.00E-02	5.24E-02
	Cadmium	1.72E-01	1.19E-02	2.15E-03	1.86E-01
	Chromium	3.50E-02	1.51E-01	6.86E-03	1.93E-01
	Copper	3.73E-01	2.55E-02	1.53E-03	4.00E-01
	Lead	1.53E-02	3.56E-03	4.69E-04	1.93E-02
	Manganese	2.48E+00	6.31E-01	8.25E-02	3.19E+00
	Molybdenum	6.23E-01	6.05E-03	2.02E-02	6.49E-01
	Nickel	3.45E-01	6.05E-02	3.52E-02	4.41E-01
	Selenium	1.58E+00	3.63E-02	4.37E-01	2.05E+00
	Vanadium	3.03E-02	8.67E-02	6.38E-03	1.23E-01
	Zinc	4.21E+00	2.47E-01	1.06E-01	4.56E+00
Northern Bobwhite	Antimony	9.62E-03	6.27E-03	1.55E-04	1.60E-02
	Arsenic	6.18E-02	5.23E-02	3.09E-02	1.45E-01
	Cadmium	4.61E-01	7.51E-02	3.33E-03	5.39E-01
	Chromium	1.32E-01	9.58E-01	1.06E-02	1.10E+00
	Copper	1.13E+00	1.61E-01	2.37E-03	1.29E+00
	Lead	3.40E-02	2.26E-02	7.24E-04	5.72E-02
	Manganese	6.46E+00	3.99E+00	1.28E-01	1.06E+01
	Molybdenum	1.33E+00	3.83E-02	3.12E-02	1.40E+00
	Nickel	7.66E-01	3.83E-01	5.45E-02	1.20E+00
	Selenium	3.52E+00	2.30E-01	6.75E-01	4.42E+00
	Vanadium	1.05E-01	5.49E-01	9.85E-03	6.64E-01
	Zinc	1.18E+01	1.56E+00	1.63E-01	1.36E+01
Northern Harrier	Antimony	5.79E-02	2.31E-03	1.12E-04	6.03E-02
	Arsenic	7.55E-02	1.93E-02	2.24E-02	1.17E-01
	Cadmium	1.26E-01	2.77E-02	2.41E-03	1.56E-01
	Chromium	9.62E-01	3.53E-01	7.70E-03	1.32E+00
	Copper	1.89E+01	5.94E-02	1.72E-03	1.90E+01
	Lead	1.11E+00	8.31E-03	5.25E-04	1.12E+00
	Manganese	3.79E+00	1.47E+00	9.25E-02	5.36E+00
	Molybdenum	1.66E-01	1.41E-02	2.26E-02	2.03E-01
	Nickel	1.48E+00	1.41E-01	3.95E-02	1.66E+00
	Selenium	2.10E+00	8.47E-02	4.90E-01	2.67E+00
	Vanadium	3.69E-01	2.02E-01	7.15E-03	5.79E-01
	Zinc	1.05E+02	5.76E-01	1.18E-01	1.05E+02

Notes:
ECOPC - Ecological Chemical of Potential Concern
mg/kg BW/day - milligram per kilogram of body weight per day

TABLE 4-8
Tier 2 Exposure Estimates
Panel D North

Receptor	ECOPC	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
American Robin	Antimony	2.48E-02	4.74E-03	2.10E-04	2.97E-02
	Arsenic	2.18E-01	3.89E-02	4.18E-02	2.99E-01
	Cadmium	1.07E+00	7.05E-02	4.50E-03	1.15E+00
	Chromium	7.00E-01	1.00E+00	1.44E-02	1.72E+00
	Copper	3.60E+00	1.49E-01	3.20E-03	3.75E+00
	Lead	5.57E-02	2.69E-02	9.80E-04	8.35E-02
	Manganese	1.72E+01	4.37E+00	1.73E-01	2.18E+01
	Molybdenum	2.08E+00	3.21E-02	4.22E-02	2.15E+00
	Nickel	1.04E+00	3.55E-01	7.37E-02	1.47E+00
	Selenium	8.45E+00	7.32E-02	9.14E-01	9.44E+00
	Vanadium	6.39E-01	6.28E-01	1.33E-02	1.28E+00
	Zinc	2.93E+01	1.63E+00	2.21E-01	3.11E+01
Coyote	Antimony	1.01E-02	1.58E-03	1.19E-04	1.18E-02
	Arsenic	5.62E-02	1.30E-02	2.36E-02	9.28E-02
	Cadmium	3.95E-02	2.35E-02	2.54E-03	6.55E-02
	Chromium	8.28E-02	3.34E-01	8.11E-03	4.25E-01
	Copper	1.63E+01	4.98E-02	1.81E-03	1.64E+01
	Lead	6.26E-01	8.96E-03	5.54E-04	6.36E-01
	Manganese	5.83E-01	1.46E+00	9.75E-02	2.14E+00
	Molybdenum	8.34E-02	1.07E-02	2.39E-02	1.18E-01
	Nickel	1.34E-01	1.18E-01	4.17E-02	2.94E-01
	Selenium	1.60E+00	2.44E-02	5.16E-01	2.14E+00
	Vanadium	4.25E-02	2.09E-01	7.53E-03	2.59E-01
	Zinc	2.15E+01	5.43E-01	1.25E-01	2.22E+01
Deer Mouse	Antimony	2.61E-02	5.61E-03	2.22E-04	3.19E-02
	Arsenic	2.09E-01	4.61E-02	4.42E-02	2.99E-01
	Cadmium	1.02E+00	8.36E-02	4.76E-03	1.10E+00
	Chromium	6.73E-01	1.19E+00	1.52E-02	1.88E+00
	Copper	3.41E+00	1.77E-01	3.39E-03	3.59E+00
	Lead	5.51E-02	3.19E-02	1.04E-03	8.80E-02
	Manganese	1.68E+01	5.17E+00	1.83E-01	2.22E+01
	Molybdenum	2.10E+00	3.80E-02	4.47E-02	2.18E+00
	Nickel	1.05E+00	4.20E-01	7.80E-02	1.55E+00
	Selenium	8.24E+00	8.67E-02	9.67E-01	9.29E+00
	Vanadium	5.91E-01	7.45E-01	1.41E-02	1.35E+00
	Zinc	2.79E+01	1.93E+00	2.34E-01	3.01E+01
Eastern Cottontail	Antimony	1.13E-02	2.63E-03	1.47E-04	1.41E-02
	Arsenic	3.43E-02	2.16E-02	2.94E-02	8.53E-02
	Cadmium	1.34E-01	3.92E-02	3.16E-03	1.77E-01
	Chromium	1.16E-01	5.57E-01	1.01E-02	6.83E-01
	Copper	4.51E-01	8.30E-02	2.25E-03	5.36E-01
	Lead	1.43E-02	1.49E-02	6.89E-04	2.99E-02
	Manganese	3.57E+00	2.43E+00	1.21E-01	6.12E+00
	Molybdenum	6.71E-01	1.78E-02	2.97E-02	7.19E-01
	Nickel	3.28E-01	1.97E-01	5.18E-02	5.76E-01
	Selenium	1.78E+00	4.07E-02	6.42E-01	2.46E+00
	Vanadium	2.98E-02	3.49E-01	9.37E-03	3.88E-01
	Zinc	4.06E+00	9.05E-01	1.55E-01	5.12E+00

TABLE 4-8
Tier 2 Exposure Estimates
Panel D North

Receptor	ECOPC	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
Mule Deer	Antimony	7.40E-03	5.26E-04	1.00E-04	8.03E-03
	Arsenic	2.25E-02	4.32E-03	2.00E-02	4.68E-02
	Cadmium	8.80E-02	7.84E-03	2.15E-03	9.80E-02
	Chromium	7.60E-02	1.11E-01	6.86E-03	1.94E-01
	Copper	2.96E-01	1.66E-02	1.53E-03	3.14E-01
	Lead	9.36E-03	2.99E-03	4.69E-04	1.28E-02
	Manganese	2.34E+00	4.85E-01	8.25E-02	2.91E+00
	Molybdenum	4.40E-01	3.56E-03	2.02E-02	4.64E-01
	Nickel	2.15E-01	3.94E-02	3.52E-02	2.90E-01
	Selenium	1.16E+00	8.13E-03	4.37E-01	1.61E+00
	Vanadium	1.96E-02	6.98E-02	6.38E-03	9.57E-02
	Zinc	2.66E+00	1.81E-01	1.06E-01	2.95E+00
Northern Bobwhite	Antimony	1.57E-02	3.33E-03	1.55E-04	1.92E-02
	Arsenic	6.64E-02	2.74E-02	3.09E-02	1.25E-01
	Cadmium	2.88E-01	4.96E-02	3.33E-03	3.41E-01
	Chromium	2.20E-01	7.05E-01	1.06E-02	9.35E-01
	Copper	9.69E-01	1.05E-01	2.37E-03	1.08E+00
	Lead	2.31E-02	1.89E-02	7.24E-04	4.27E-02
	Manganese	6.21E+00	3.07E+00	1.28E-01	9.41E+00
	Molybdenum	1.01E+00	2.26E-02	3.12E-02	1.07E+00
	Nickel	4.99E-01	2.49E-01	5.45E-02	8.03E-01
	Selenium	3.07E+00	5.15E-02	6.75E-01	3.80E+00
	Vanadium	1.16E-01	4.42E-01	9.85E-03	5.68E-01
	Zinc	8.32E+00	1.15E+00	1.63E-01	9.63E+00
Northern Harrier	Antimony	3.23E-02	1.23E-03	1.12E-04	3.36E-02
	Arsenic	1.76E-01	1.01E-02	2.24E-02	2.08E-01
	Cadmium	8.81E-02	1.83E-02	2.41E-03	1.09E-01
	Chromium	2.44E-01	2.60E-01	7.70E-03	5.12E-01
	Copper	5.35E+01	3.87E-02	1.72E-03	5.35E+01
	Lead	2.05E+00	6.97E-03	5.25E-04	2.06E+00
	Manganese	1.24E+00	1.13E+00	9.25E-02	2.46E+00
	Molybdenum	1.91E-01	8.32E-03	2.26E-02	2.22E-01
	Nickel	3.99E-01	9.19E-02	3.95E-02	5.31E-01
	Selenium	4.92E+00	1.90E-02	4.90E-01	5.43E+00
	Vanadium	1.15E-01	1.63E-01	7.15E-03	2.85E-01
	Zinc	6.94E+01	4.23E-01	1.18E-01	6.99E+01

Notes:

ECOPC - Ecological Chemical of Potential Concern
mg/kg BW/day - milligram per kilogram of body weight per day

TABLE 4-9
Tier 2 Exposure Estimates
Panel D South

Receptor	ECOPC	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
American Robin	Antimony	1.47E-02	7.23E-03	2.10E-04	2.21E-02
	Arsenic	2.00E-01	4.05E-02	4.18E-02	2.82E-01
	Cadmium	6.84E-01	9.48E-02	4.50E-03	7.84E-01
	Chromium	7.36E-01	1.16E+00	1.44E-02	1.91E+00
	Copper	3.29E+00	1.90E-01	3.20E-03	3.48E+00
	Lead	3.02E-02	3.11E-02	9.80E-04	6.23E-02
	Manganese	2.62E+01	4.27E+00	1.73E-01	3.06E+01
	Molybdenum	1.74E+00	3.71E-02	4.22E-02	1.82E+00
	Nickel	8.56E-01	3.83E-01	7.37E-02	1.31E+00
	Selenium	6.24E+00	5.12E-02	9.14E-01	7.21E+00
	Vanadium	4.09E-01	7.88E-01	1.33E-02	1.21E+00
	Zinc	2.45E+01	1.77E+00	2.21E-01	2.65E+01
Coyote	Antimony	1.11E-02	2.41E-03	1.19E-04	1.36E-02
	Arsenic	3.74E-02	1.35E-02	2.36E-02	7.45E-02
	Cadmium	2.87E-02	3.16E-02	2.54E-03	6.29E-02
	Chromium	1.82E-01	3.85E-01	8.11E-03	5.75E-01
	Copper	2.86E+01	6.32E-02	1.81E-03	2.86E+01
	Lead	1.64E+00	1.04E-02	5.54E-04	1.66E+00
	Manganese	1.33E+00	1.42E+00	9.75E-02	2.85E+00
	Molybdenum	6.71E-02	1.24E-02	2.39E-02	1.03E-01
	Nickel	3.25E-01	1.28E-01	4.17E-02	4.94E-01
	Selenium	1.22E+00	1.71E-02	5.16E-01	1.76E+00
	Vanadium	7.79E-02	2.63E-01	7.53E-03	3.48E-01
	Zinc	3.36E+01	5.89E-01	1.25E-01	3.43E+01
Deer Mouse	Antimony	1.52E-02	8.57E-03	2.22E-04	2.40E-02
	Arsenic	1.90E-01	4.80E-02	4.42E-02	2.83E-01
	Cadmium	6.45E-01	1.12E-01	4.76E-03	7.62E-01
	Chromium	6.88E-01	1.37E+00	1.52E-02	2.07E+00
	Copper	3.12E+00	2.25E-01	3.39E-03	3.35E+00
	Lead	2.94E-02	3.68E-02	1.04E-03	6.73E-02
	Manganese	2.57E+01	5.06E+00	1.83E-01	3.10E+01
	Molybdenum	1.78E+00	4.39E-02	4.47E-02	1.86E+00
	Nickel	8.54E-01	4.54E-01	7.80E-02	1.39E+00
	Selenium	6.07E+00	6.06E-02	9.67E-01	7.10E+00
	Vanadium	3.81E-01	9.33E-01	1.41E-02	1.33E+00
	Zinc	2.32E+01	2.09E+00	2.34E-01	2.56E+01
Eastern Cottontail	Antimony	6.03E-03	4.02E-03	1.47E-04	1.02E-02
	Arsenic	2.88E-02	2.25E-02	2.94E-02	8.07E-02
	Cadmium	7.25E-02	5.27E-02	3.16E-03	1.28E-01
	Chromium	5.98E-02	6.42E-01	1.01E-02	7.12E-01
	Copper	4.14E-01	1.05E-01	2.25E-03	5.22E-01
	Lead	6.22E-03	1.73E-02	6.89E-04	2.42E-02
	Manganese	6.19E+00	2.37E+00	1.21E-01	8.68E+00
	Molybdenum	6.21E-01	2.06E-02	2.97E-02	6.71E-01
	Nickel	2.42E-01	2.13E-01	5.18E-02	5.07E-01
	Selenium	1.25E+00	2.84E-02	6.42E-01	1.92E+00
	Vanadium	2.79E-02	4.38E-01	9.37E-03	4.75E-01
	Zinc	3.05E+00	9.81E-01	1.55E-01	4.18E+00

TABLE 4-9
Tier 2 Exposure Estimates
Panel D South

Receptor	ECOPC	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
Mule Deer	Antimony	3.96E-03	8.03E-04	1.00E-04	4.86E-03
	Arsenic	1.89E-02	4.50E-03	2.00E-02	4.34E-02
	Cadmium	4.75E-02	1.05E-02	2.15E-03	6.02E-02
	Chromium	3.92E-02	1.28E-01	6.86E-03	1.75E-01
	Copper	2.72E-01	2.11E-02	1.53E-03	2.94E-01
	Lead	4.08E-03	3.45E-03	4.69E-04	8.00E-03
	Manganese	4.06E+00	4.74E-01	8.25E-02	4.62E+00
	Molybdenum	4.07E-01	4.12E-03	2.02E-02	4.32E-01
	Nickel	1.59E-01	4.26E-02	3.52E-02	2.37E-01
	Selenium	8.22E-01	5.69E-03	4.37E-01	1.26E+00
	Vanadium	1.83E-02	8.75E-02	6.38E-03	1.12E-01
	Zinc	2.00E+00	1.96E-01	1.06E-01	2.30E+00
Northern Bobwhite	Antimony	8.60E-03	5.09E-03	1.55E-04	1.38E-02
	Arsenic	5.79E-02	2.85E-02	3.09E-02	1.17E-01
	Cadmium	1.70E-01	6.67E-02	3.33E-03	2.40E-01
	Chromium	1.62E-01	8.13E-01	1.06E-02	9.86E-01
	Copper	8.88E-01	1.34E-01	2.37E-03	1.02E+00
	Lead	1.08E-02	2.19E-02	7.24E-04	3.34E-02
	Manganese	1.03E+01	3.00E+00	1.28E-01	1.34E+01
	Molybdenum	9.15E-01	2.61E-02	3.12E-02	9.72E-01
	Nickel	3.80E-01	2.70E-01	5.45E-02	7.04E-01
	Selenium	2.20E+00	3.60E-02	6.75E-01	2.91E+00
	Vanadium	8.42E-02	5.54E-01	9.85E-03	6.48E-01
	Zinc	6.57E+00	1.24E+00	1.63E-01	7.98E+00
Northern Harrier	Antimony	3.57E-02	1.87E-03	1.12E-04	3.77E-02
	Arsenic	1.15E-01	1.05E-02	2.24E-02	1.48E-01
	Cadmium	6.78E-02	2.46E-02	2.41E-03	9.48E-02
	Chromium	5.69E-01	3.00E-01	7.70E-03	8.76E-01
	Copper	9.37E+01	4.92E-02	1.72E-03	9.38E+01
	Lead	5.40E+00	8.06E-03	5.25E-04	5.40E+00
	Manganese	3.34E+00	1.11E+00	9.25E-02	4.54E+00
	Molybdenum	1.51E-01	9.61E-03	2.26E-02	1.83E-01
	Nickel	1.03E+00	9.93E-02	3.95E-02	1.17E+00
	Selenium	3.77E+00	1.33E-02	4.90E-01	4.27E+00
	Vanadium	2.40E-01	2.04E-01	7.15E-03	4.51E-01
	Zinc	1.09E+02	4.58E-01	1.18E-01	1.10E+02

Notes:
ECOPC - Ecological Chemical of Potential Concern
mg/kg BW/day - milligram per kilogram of body weight per day

TABLE 4-10
Tier 2 Exposure Estimates
Panel E Area 1

Receptor	ECOPC	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
American Robin	Antimony	9.76E-03	1.36E-03	2.10E-04	1.13E-02
	Arsenic	7.57E-02	2.16E-02	4.18E-02	1.39E-01
	Cadmium	1.90E+00	3.54E-02	4.50E-03	1.94E+00
	Chromium	1.79E+00	5.69E-01	1.44E-02	2.37E+00
	Copper	3.78E+00	1.08E-01	3.20E-03	3.89E+00
	Lead	5.93E-02	3.84E-02	9.80E-04	9.88E-02
	Manganese	3.58E+01	7.62E+00	1.73E-01	4.36E+01
	Molybdenum	1.14E+00	2.34E-02	4.22E-02	1.21E+00
	Nickel	8.27E-01	2.26E-01	7.37E-02	1.13E+00
	Selenium	6.60E-01	8.24E-03	9.14E-01	1.58E+00
	Vanadium	5.92E-01	2.86E-01	1.33E-02	8.92E-01
	Zinc	2.47E+01	9.32E-01	2.21E-01	2.59E+01
Coyote	Antimony	2.29E-02	4.53E-04	1.19E-04	2.35E-02
	Arsenic	8.70E-03	7.19E-03	2.36E-02	3.95E-02
	Cadmium	9.01E-02	1.18E-02	2.54E-03	1.04E-01
	Chromium	1.22E-01	1.90E-01	8.11E-03	3.20E-01
	Copper	1.16E+01	3.60E-02	1.81E-03	1.16E+01
	Lead	4.54E+00	1.28E-02	5.54E-04	4.56E+00
	Manganese	9.83E-01	2.54E+00	9.75E-02	3.62E+00
	Molybdenum	5.88E-02	7.80E-03	2.39E-02	9.05E-02
	Nickel	9.54E-02	7.54E-02	4.17E-02	2.12E-01
	Selenium	1.21E-01	2.75E-03	5.16E-01	6.40E-01
	Vanadium	4.31E-02	9.54E-02	7.53E-03	1.46E-01
	Zinc	1.81E+01	3.11E-01	1.25E-01	1.85E+01
Deer Mouse	Antimony	9.07E-03	1.61E-03	2.22E-04	1.09E-02
	Arsenic	7.17E-02	2.56E-02	4.42E-02	1.41E-01
	Cadmium	1.74E+00	4.20E-02	4.76E-03	1.79E+00
	Chromium	1.68E+00	6.74E-01	1.52E-02	2.37E+00
	Copper	3.56E+00	1.28E-01	3.39E-03	3.69E+00
	Lead	5.69E-02	4.56E-02	1.04E-03	1.04E-01
	Manganese	3.52E+01	9.03E+00	1.83E-01	4.44E+01
	Molybdenum	1.19E+00	2.77E-02	4.47E-02	1.26E+00
	Nickel	8.19E-01	2.68E-01	7.80E-02	1.16E+00
	Selenium	6.36E-01	9.77E-03	9.67E-01	1.61E+00
	Vanadium	5.51E-01	3.39E-01	1.41E-02	9.04E-01
	Zinc	2.31E+01	1.10E+00	2.34E-01	2.44E+01
Eastern Cottontail	Antimony	6.07E-04	7.55E-04	1.47E-04	1.51E-03
	Arsenic	8.91E-03	1.20E-02	2.94E-02	5.03E-02
	Cadmium	4.37E-02	1.97E-02	3.16E-03	6.66E-02
	Chromium	1.88E-01	3.16E-01	1.01E-02	5.14E-01
	Copper	4.01E-01	5.99E-02	2.25E-03	4.63E-01
	Lead	9.46E-03	2.14E-02	6.89E-04	3.15E-02
	Manganese	8.49E+00	4.23E+00	1.21E-01	1.28E+01
	Molybdenum	4.76E-01	1.30E-02	2.97E-02	5.18E-01
	Nickel	2.15E-01	1.26E-01	5.18E-02	3.92E-01
	Selenium	1.16E-01	4.58E-03	6.42E-01	7.63E-01
	Vanadium	3.87E-02	1.59E-01	9.37E-03	2.07E-01
	Zinc	1.88E+00	5.18E-01	1.55E-01	2.55E+00

TABLE 4-10
Tier 2 Exposure Estimates
Panel E Area 1

Receptor	ECOPC	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
Mule Deer	Antimony	3.98E-04	1.51E-04	1.00E-04	6.49E-04
	Arsenic	5.84E-03	2.40E-03	2.00E-02	2.82E-02
	Cadmium	2.87E-02	3.93E-03	2.15E-03	3.48E-02
	Chromium	1.23E-01	6.32E-02	6.86E-03	1.93E-01
	Copper	2.63E-01	1.20E-02	1.53E-03	2.76E-01
	Lead	6.20E-03	4.27E-03	4.69E-04	1.09E-02
	Manganese	5.56E+00	8.47E-01	8.25E-02	6.49E+00
	Molybdenum	3.12E-01	2.60E-03	2.02E-02	3.35E-01
	Nickel	1.41E-01	2.51E-02	3.52E-02	2.01E-01
	Selenium	7.62E-02	9.16E-04	4.37E-01	5.14E-01
	Vanadium	2.54E-02	3.18E-02	6.38E-03	6.36E-02
	Zinc	1.23E+00	1.04E-01	1.06E-01	1.44E+00
Northern Bobwhite	Antimony	1.94E-03	9.56E-04	1.55E-04	3.06E-03
	Arsenic	1.97E-02	1.52E-02	3.09E-02	6.58E-02
	Cadmium	2.96E-01	2.49E-02	3.33E-03	3.25E-01
	Chromium	4.41E-01	4.00E-01	1.06E-02	8.52E-01
	Copper	9.37E-01	7.59E-02	2.37E-03	1.01E+00
	Lead	1.82E-02	2.71E-02	7.24E-04	4.60E-02
	Manganese	1.41E+01	5.36E+00	1.28E-01	1.96E+01
	Molybdenum	6.77E-01	1.65E-02	3.12E-02	7.24E-01
	Nickel	3.46E-01	1.59E-01	5.45E-02	5.59E-01
	Selenium	2.15E-01	5.80E-03	6.75E-01	8.96E-01
	Vanadium	1.20E-01	2.01E-01	9.85E-03	3.31E-01
	Zinc	5.30E+00	6.56E-01	1.63E-01	6.12E+00
Northern Harrier	Antimony	7.48E-02	3.52E-04	1.12E-04	7.53E-02
	Arsenic	2.56E-02	5.59E-03	2.24E-02	5.36E-02
	Cadmium	2.23E-01	9.18E-03	2.41E-03	2.35E-01
	Chromium	3.32E-01	1.47E-01	7.70E-03	4.87E-01
	Copper	3.78E+01	2.80E-02	1.72E-03	3.78E+01
	Lead	1.49E+01	9.97E-03	5.25E-04	1.49E+01
	Manganese	1.82E+00	1.98E+00	9.25E-02	3.89E+00
	Molybdenum	1.47E-01	6.07E-03	2.26E-02	1.75E-01
	Nickel	2.81E-01	5.86E-02	3.95E-02	3.79E-01
	Selenium	3.73E-01	2.14E-03	4.90E-01	8.65E-01
	Vanadium	1.19E-01	7.42E-02	7.15E-03	2.00E-01
	Zinc	5.84E+01	2.42E-01	1.18E-01	5.88E+01

Notes:
ECOPC - Ecological Chemical of Potential Concern
mg/kg BW/day - milligram per kilogram of body weight per day

TABLE 4-11
Tier 2 Exposure Estimates
Panel E Area 2

Receptor	ECOPC	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
American Robin	Antimony	1.07E-02	2.55E-04	2.10E-04	1.11E-02
	Arsenic	3.76E-02	1.22E-02	4.18E-02	9.16E-02
	Cadmium	2.48E-01	1.72E-02	4.50E-03	2.69E-01
	Chromium	2.70E-01	1.24E-01	1.44E-02	4.08E-01
	Copper	2.99E+00	7.18E-02	3.20E-03	3.07E+00
	Lead	5.01E-02	4.41E-02	9.80E-04	9.51E-02
	Manganese	4.15E+01	9.05E+00	1.73E-01	5.07E+01
	Molybdenum	6.46E-01	4.60E-03	4.22E-02	6.93E-01
	Nickel	3.13E-01	1.05E-01	7.37E-02	4.92E-01
	Selenium	6.99E-01	1.35E-03	9.14E-01	1.61E+00
	Vanadium	1.26E-01	1.10E-01	1.33E-02	2.49E-01
	Zinc	1.93E+01	3.33E-01	2.21E-01	1.98E+01
Coyote	Antimony	1.61E-02	8.49E-05	1.19E-04	1.63E-02
	Arsenic	3.71E-02	4.08E-03	2.36E-02	6.48E-02
	Cadmium	1.10E-02	5.73E-03	2.54E-03	1.93E-02
	Chromium	7.95E-02	4.13E-02	8.11E-03	1.29E-01
	Copper	1.09E+01	2.39E-02	1.81E-03	1.09E+01
	Lead	1.51E+00	1.47E-02	5.54E-04	1.53E+00
	Manganese	1.13E+00	3.02E+00	9.75E-02	4.25E+00
	Molybdenum	4.42E-02	1.53E-03	2.39E-02	6.96E-02
	Nickel	7.56E-02	3.51E-02	4.17E-02	1.52E-01
	Selenium	8.40E-02	4.49E-04	5.16E-01	6.01E-01
	Vanadium	2.85E-02	3.66E-02	7.53E-03	7.26E-02
	Zinc	1.30E+01	1.11E-01	1.25E-01	1.33E+01
Deer Mouse	Antimony	1.13E-02	3.02E-04	2.22E-04	1.18E-02
	Arsenic	3.60E-02	1.45E-02	4.42E-02	9.48E-02
	Cadmium	2.32E-01	2.04E-02	4.76E-03	2.57E-01
	Chromium	2.71E-01	1.47E-01	1.52E-02	4.33E-01
	Copper	2.82E+00	8.51E-02	3.39E-03	2.91E+00
	Lead	5.03E-02	5.22E-02	1.04E-03	1.04E-01
	Manganese	4.05E+01	1.07E+01	1.83E-01	5.15E+01
	Molybdenum	6.74E-01	5.45E-03	4.47E-02	7.24E-01
	Nickel	3.09E-01	1.25E-01	7.80E-02	5.12E-01
	Selenium	6.40E-01	1.60E-03	9.67E-01	1.61E+00
	Vanadium	1.22E-01	1.30E-01	1.41E-02	2.66E-01
	Zinc	1.80E+01	3.94E-01	2.34E-01	1.86E+01
Eastern Cottontail	Antimony	4.98E-03	1.41E-04	1.47E-04	5.27E-03
	Arsenic	5.90E-03	6.80E-03	2.94E-02	4.21E-02
	Cadmium	2.05E-02	9.56E-03	3.16E-03	3.32E-02
	Chromium	8.24E-02	6.88E-02	1.01E-02	1.61E-01
	Copper	3.18E-01	3.99E-02	2.25E-03	3.60E-01
	Lead	1.52E-02	2.45E-02	6.89E-04	4.04E-02
	Manganese	9.03E+00	5.03E+00	1.21E-01	1.42E+01
	Molybdenum	2.76E-01	2.55E-03	2.97E-02	3.09E-01
	Nickel	7.89E-02	5.85E-02	5.18E-02	1.89E-01
	Selenium	1.27E-02	7.49E-04	6.42E-01	6.56E-01
	Vanadium	2.48E-02	6.10E-02	9.37E-03	9.52E-02
	Zinc	1.29E+00	1.85E-01	1.55E-01	1.63E+00

TABLE 4-11
Tier 2 Exposure Estimates
Panel E Area 2

Receptor	ECOPC	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
Mule Deer	Antimony	3.26E-03	2.83E-05	1.00E-04	3.39E-03
	Arsenic	3.87E-03	1.36E-03	2.00E-02	2.52E-02
	Cadmium	1.34E-02	1.91E-03	2.15E-03	1.75E-02
	Chromium	5.40E-02	1.38E-02	6.86E-03	7.46E-02
	Copper	2.09E-01	7.98E-03	1.53E-03	2.18E-01
	Lead	9.96E-03	4.90E-03	4.69E-04	1.53E-02
	Manganese	5.92E+00	1.01E+00	8.25E-02	7.01E+00
	Molybdenum	1.81E-01	5.11E-04	2.02E-02	2.02E-01
	Nickel	5.17E-02	1.17E-02	3.52E-02	9.87E-02
	Selenium	8.32E-03	1.50E-04	4.37E-01	4.45E-01
	Vanadium	1.62E-02	1.22E-02	6.38E-03	3.48E-02
	Zinc	8.44E-01	3.70E-02	1.06E-01	9.86E-01
Northern Bobwhite	Antimony	6.91E-03	1.79E-04	1.55E-04	7.24E-03
	Arsenic	1.14E-02	8.62E-03	3.09E-02	5.10E-02
	Cadmium	5.50E-02	1.21E-02	3.33E-03	7.04E-02
	Chromium	1.26E-01	8.71E-02	1.06E-02	2.24E-01
	Copper	7.43E-01	5.05E-02	2.37E-03	7.95E-01
	Lead	2.34E-02	3.10E-02	7.24E-04	5.51E-02
	Manganese	1.54E+01	6.37E+00	1.28E-01	2.19E+01
	Molybdenum	3.91E-01	3.23E-03	3.12E-02	4.25E-01
	Nickel	1.28E-01	7.41E-02	5.45E-02	2.57E-01
	Selenium	1.05E-01	9.48E-04	6.75E-01	7.81E-01
	Vanadium	4.38E-02	7.73E-02	9.85E-03	1.31E-01
	Zinc	3.94E+00	2.34E-01	1.63E-01	4.34E+00
Northern Harrier	Antimony	5.23E-02	6.60E-05	1.12E-04	5.25E-02
	Arsenic	1.20E-01	3.18E-03	2.24E-02	1.46E-01
	Cadmium	2.65E-02	4.46E-03	2.41E-03	3.34E-02
	Chromium	2.50E-01	3.21E-02	7.70E-03	2.90E-01
	Copper	3.57E+01	1.86E-02	1.72E-03	3.57E+01
	Lead	4.97E+00	1.14E-02	5.25E-04	4.98E+00
	Manganese	2.09E+00	2.35E+00	9.25E-02	4.53E+00
	Molybdenum	1.19E-01	1.19E-03	2.26E-02	1.43E-01
	Nickel	2.36E-01	2.73E-02	3.95E-02	3.03E-01
	Selenium	2.49E-01	3.49E-04	4.90E-01	7.39E-01
	Vanadium	8.86E-02	2.85E-02	7.15E-03	1.24E-01
	Zinc	4.20E+01	8.62E-02	1.18E-01	4.22E+01

Notes:

ECOPC - Ecological Chemical of Potential Concern

mg/kg BW/day - milligram per kilogram of body weight per day

TABLE 4-12
Tier 2 Exposure Estimates
Pole Canyon ODA

Receptor	ECOPC	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
American Robin	Antimony	1.09E-01	7.05E-03	2.10E-04	1.16E-01
	Arsenic	1.45E-01	5.09E-02	4.18E-02	2.38E-01
	Cadmium	1.08E+00	8.99E-02	4.50E-03	1.17E+00
	Chromium	5.17E-01	1.32E+00	1.44E-02	1.85E+00
	Copper	3.71E+00	1.93E-01	3.20E-03	3.91E+00
	Lead	2.49E-02	3.15E-02	9.80E-04	5.73E-02
	Manganese	2.14E+01	5.38E+00	1.73E-01	2.69E+01
	Molybdenum	1.86E+00	4.47E-02	4.22E-02	1.95E+00
	Nickel	1.44E+00	4.93E-01	7.37E-02	2.00E+00
	Selenium	4.54E+00	6.56E-02	9.14E-01	5.52E+00
	Vanadium	1.75E-01	6.51E-01	1.33E-02	8.39E-01
	Zinc	3.30E+01	2.32E+00	2.21E-01	3.55E+01
Coyote	Antimony	3.53E-02	2.35E-03	1.19E-04	3.77E-02
	Arsenic	5.40E-02	1.70E-02	2.36E-02	9.46E-02
	Cadmium	4.66E-02	3.00E-02	2.54E-03	7.91E-02
	Chromium	1.22E-01	4.40E-01	8.11E-03	5.70E-01
	Copper	1.22E+02	6.43E-02	1.81E-03	1.22E+02
	Lead	6.88E+00	1.05E-02	5.54E-04	6.89E+00
	Manganese	6.33E-01	1.79E+00	9.75E-02	2.52E+00
	Molybdenum	7.29E-02	1.49E-02	2.39E-02	1.12E-01
	Nickel	9.77E-01	1.64E-01	4.17E-02	1.18E+00
	Selenium	1.74E+00	2.19E-02	5.16E-01	2.28E+00
	Vanadium	5.11E-02	2.17E-01	7.53E-03	2.75E-01
	Zinc	4.51E+01	7.75E-01	1.25E-01	4.60E+01
Deer Mouse	Antimony	9.94E-02	8.36E-03	2.22E-04	1.08E-01
	Arsenic	1.38E-01	6.03E-02	4.42E-02	2.42E-01
	Cadmium	1.02E+00	1.07E-01	4.76E-03	1.14E+00
	Chromium	5.18E-01	1.56E+00	1.52E-02	2.10E+00
	Copper	3.53E+00	2.29E-01	3.39E-03	3.76E+00
	Lead	2.46E-02	3.73E-02	1.04E-03	6.29E-02
	Manganese	2.16E+01	6.37E+00	1.83E-01	2.82E+01
	Molybdenum	1.92E+00	5.30E-02	4.47E-02	2.02E+00
	Nickel	1.49E+00	5.84E-01	7.80E-02	2.15E+00
	Selenium	4.40E+00	7.77E-02	9.67E-01	5.44E+00
	Vanadium	1.67E-01	7.71E-01	1.41E-02	9.52E-01
	Zinc	3.15E+01	2.76E+00	2.34E-01	3.45E+01
Eastern Cottontail	Antimony	2.07E-03	3.92E-03	1.47E-04	6.14E-03
	Arsenic	1.88E-02	2.83E-02	2.94E-02	7.64E-02
	Cadmium	1.30E-01	4.99E-02	3.16E-03	1.84E-01
	Chromium	1.54E-01	7.34E-01	1.01E-02	8.97E-01
	Copper	4.95E-01	1.07E-01	2.25E-03	6.05E-01
	Lead	6.16E-03	1.75E-02	6.89E-04	2.43E-02
	Manganese	6.96E+00	2.99E+00	1.21E-01	1.01E+01
	Molybdenum	7.28E-01	2.48E-02	2.97E-02	7.82E-01
	Nickel	5.77E-01	2.74E-01	5.18E-02	9.03E-01
	Selenium	8.79E-01	3.64E-02	6.42E-01	1.56E+00
	Vanadium	2.24E-02	3.62E-01	9.37E-03	3.93E-01
	Zinc	4.78E+00	1.29E+00	1.55E-01	6.23E+00

TABLE 4-12
Tier 2 Exposure Estimates
Pole Canyon ODA

Receptor	ECOPC	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
Mule Deer	Antimony	1.36E-03	7.84E-04	1.00E-04	2.24E-03
	Arsenic	1.23E-02	5.65E-03	2.00E-02	3.80E-02
	Cadmium	8.56E-02	9.99E-03	2.15E-03	9.77E-02
	Chromium	1.01E-01	1.47E-01	6.86E-03	2.54E-01
	Copper	3.25E-01	2.14E-02	1.53E-03	3.48E-01
	Lead	4.04E-03	3.50E-03	4.69E-04	8.00E-03
	Manganese	4.56E+00	5.98E-01	8.25E-02	5.24E+00
	Molybdenum	4.77E-01	4.97E-03	2.02E-02	5.02E-01
	Nickel	3.79E-01	5.48E-02	3.52E-02	4.69E-01
	Selenium	5.76E-01	7.28E-03	4.37E-01	1.02E+00
	Vanadium	1.47E-02	7.23E-02	6.38E-03	9.34E-02
	Zinc	3.14E+00	2.58E-01	1.06E-01	3.50E+00
Northern Bobwhite	Antimony	1.64E-02	4.96E-03	1.55E-04	2.16E-02
	Arsenic	3.97E-02	3.58E-02	3.09E-02	1.06E-01
	Cadmium	2.85E-01	6.33E-02	3.33E-03	3.52E-01
	Chromium	2.38E-01	9.29E-01	1.06E-02	1.18E+00
	Copper	1.03E+00	1.36E-01	2.37E-03	1.17E+00
	Lead	1.01E-02	2.21E-02	7.24E-04	3.29E-02
	Manganese	1.05E+01	3.78E+00	1.28E-01	1.44E+01
	Molybdenum	1.05E+00	3.15E-02	3.12E-02	1.11E+00
	Nickel	8.27E-01	3.47E-01	5.45E-02	1.23E+00
	Selenium	1.57E+00	4.61E-02	6.75E-01	2.29E+00
	Vanadium	4.78E-02	4.58E-01	9.85E-03	5.16E-01
	Zinc	9.60E+00	1.64E+00	1.63E-01	1.14E+01
Northern Harrier	Antimony	1.12E-01	1.83E-03	1.12E-04	1.14E-01
	Arsenic	1.72E-01	1.32E-02	2.24E-02	2.07E-01
	Cadmium	1.11E-01	2.33E-02	2.41E-03	1.37E-01
	Chromium	3.81E-01	3.42E-01	7.70E-03	7.31E-01
	Copper	4.00E+02	5.00E-02	1.72E-03	4.00E+02
	Lead	2.26E+01	8.16E-03	5.25E-04	2.26E+01
	Manganese	1.23E+00	1.39E+00	9.25E-02	2.71E+00
	Molybdenum	1.64E-01	1.16E-02	2.26E-02	1.99E-01
	Nickel	3.15E+00	1.28E-01	3.95E-02	3.32E+00
	Selenium	5.54E+00	1.70E-02	4.90E-01	6.04E+00
	Vanadium	1.61E-01	1.69E-01	7.15E-03	3.37E-01
	Zinc	1.47E+02	6.03E-01	1.18E-01	1.47E+02

Notes:
ECOPC - Ecological Chemical of Potential Concern
mg/kg BW/day - milligram per kilogram of body weight per day
ODA - Overburden Disposal Area

TABLE 4-13
Tier 2 Exposure Estimates
North Sage Valley

Receptor	ECOPC	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
American Robin	Antimony	1.08E-01	3.67E-04	2.10E-04	1.09E-01
	Arsenic	4.05E-02	1.35E-02	4.18E-02	9.59E-02
	Cadmium	3.53E-01	1.20E-02	4.50E-03	3.70E-01
	Chromium	1.79E-01	1.17E-01	1.44E-02	3.11E-01
	Copper	3.80E+00	7.72E-02	3.20E-03	3.88E+00
	Lead	3.56E-02	4.59E-02	9.80E-04	8.25E-02
	Manganese	3.74E+01	4.15E+00	1.73E-01	4.17E+01
	Molybdenum	4.19E-01	3.00E-03	4.22E-02	4.65E-01
	Nickel	2.63E-01	6.96E-02	7.37E-02	4.06E-01
	Selenium	1.07E+00	1.68E-03	9.14E-01	1.99E+00
	Vanadium	6.86E-02	1.23E-01	1.33E-02	2.05E-01
	Zinc	2.03E+01	4.55E-01	2.21E-01	2.10E+01
Coyote	Antimony	1.66E-02	1.22E-04	1.19E-04	1.68E-02
	Arsenic	7.40E-03	4.51E-03	2.36E-02	3.55E-02
	Cadmium	1.88E-02	4.01E-03	2.54E-03	2.54E-02
	Chromium	8.37E-02	3.92E-02	8.11E-03	1.31E-01
	Copper	1.51E+01	2.57E-02	1.81E-03	1.52E+01
	Lead	5.76E-01	1.53E-02	5.54E-04	5.92E-01
	Manganese	1.93E+00	1.38E+00	9.75E-02	3.42E+00
	Molybdenum	4.36E-02	1.00E-03	2.39E-02	6.85E-02
	Nickel	1.65E-01	2.32E-02	4.17E-02	2.30E-01
	Selenium	9.91E-02	5.62E-04	5.16E-01	6.16E-01
	Vanadium	2.91E-02	4.09E-02	7.53E-03	7.75E-02
	Zinc	4.42E+01	1.52E-01	1.25E-01	4.44E+01
Deer Mouse	Antimony	9.90E-02	4.35E-04	2.22E-04	9.96E-02
	Arsenic	3.82E-02	1.60E-02	4.42E-02	9.84E-02
	Cadmium	3.28E-01	1.43E-02	4.76E-03	3.47E-01
	Chromium	1.85E-01	1.39E-01	1.52E-02	3.40E-01
	Copper	3.64E+00	9.15E-02	3.39E-03	3.73E+00
	Lead	3.50E-02	5.44E-02	1.04E-03	9.04E-02
	Manganese	3.64E+01	4.92E+00	1.83E-01	4.15E+01
	Molybdenum	4.31E-01	3.56E-03	4.47E-02	4.79E-01
	Nickel	2.58E-01	8.25E-02	7.80E-02	4.18E-01
	Selenium	1.00E+00	2.00E-03	9.67E-01	1.97E+00
	Vanadium	6.66E-02	1.45E-01	1.41E-02	2.26E-01
	Zinc	1.91E+01	5.40E-01	2.34E-01	1.99E+01
Eastern Cottontail	Antimony	1.83E-03	2.04E-04	1.47E-04	2.18E-03
	Arsenic	4.15E-03	7.52E-03	2.94E-02	4.11E-02
	Cadmium	2.03E-02	6.68E-03	3.16E-03	3.01E-02
	Chromium	7.12E-02	6.53E-02	1.01E-02	1.47E-01
	Copper	5.86E-01	4.29E-02	2.25E-03	6.31E-01
	Lead	8.30E-03	2.55E-02	6.89E-04	3.45E-02
	Manganese	7.63E+00	2.31E+00	1.21E-01	1.01E+01
	Molybdenum	1.59E-01	1.67E-03	2.97E-02	1.91E-01
	Nickel	5.97E-02	3.87E-02	5.18E-02	1.50E-01
	Selenium	8.53E-02	9.36E-04	6.42E-01	7.28E-01
	Vanadium	1.35E-02	6.82E-02	9.37E-03	9.10E-02
	Zinc	1.92E+00	2.53E-01	1.55E-01	2.33E+00

TABLE 4-13
Tier 2 Exposure Estimates
North Sage Valley

Receptor	ECOPC	Exposure (mg/kg BW/day)			
		Food	Soil	Surface Water	Total
Mule Deer	Antimony	1.20E-03	4.08E-05	1.00E-04	1.34E-03
	Arsenic	2.72E-03	1.50E-03	2.00E-02	2.42E-02
	Cadmium	1.33E-02	1.34E-03	2.15E-03	1.68E-02
	Chromium	4.67E-02	1.31E-02	6.86E-03	6.66E-02
	Copper	3.84E-01	8.57E-03	1.53E-03	3.94E-01
	Lead	5.44E-03	5.10E-03	4.69E-04	1.10E-02
	Manganese	5.00E+00	4.61E-01	8.25E-02	5.54E+00
	Molybdenum	1.05E-01	3.34E-04	2.02E-02	1.25E-01
	Nickel	3.92E-02	7.73E-03	3.52E-02	8.21E-02
	Selenium	5.60E-02	1.87E-04	4.37E-01	4.93E-01
	Vanadium	8.84E-03	1.36E-02	6.38E-03	2.88E-02
	Zinc	1.26E+00	5.06E-02	1.06E-01	1.41E+00
Northern Bobwhite	Antimony	1.61E-02	2.58E-04	1.55E-04	1.65E-02
	Arsenic	9.88E-03	9.52E-03	3.09E-02	5.03E-02
	Cadmium	6.85E-02	8.46E-03	3.33E-03	8.03E-02
	Chromium	1.02E-01	8.27E-02	1.06E-02	1.96E-01
	Copper	1.14E+00	5.43E-02	2.37E-03	1.20E+00
	Lead	1.38E-02	3.23E-02	7.24E-04	4.69E-02
	Manganese	1.33E+01	2.92E+00	1.28E-01	1.64E+01
	Molybdenum	2.31E-01	2.11E-03	3.12E-02	2.65E-01
	Nickel	1.01E-01	4.90E-02	5.45E-02	2.04E-01
	Selenium	2.35E-01	1.19E-03	6.75E-01	9.11E-01
	Vanadium	2.39E-02	8.63E-02	9.85E-03	1.20E-01
	Zinc	4.78E+00	3.20E-01	1.63E-01	5.26E+00
Northern Harrier	Antimony	5.03E-02	9.52E-05	1.12E-04	5.05E-02
	Arsenic	2.27E-02	3.51E-03	2.24E-02	4.87E-02
	Cadmium	4.82E-02	3.12E-03	2.41E-03	5.38E-02
	Chromium	2.67E-01	3.05E-02	7.70E-03	3.06E-01
	Copper	4.95E+01	2.00E-02	1.72E-03	4.95E+01
	Lead	1.89E+00	1.19E-02	5.25E-04	1.90E+00
	Manganese	4.88E+00	1.08E+00	9.25E-02	6.05E+00
	Molybdenum	1.26E-01	7.78E-04	2.26E-02	1.50E-01
	Nickel	5.33E-01	1.80E-02	3.95E-02	5.90E-01
	Selenium	2.84E-01	4.37E-04	4.90E-01	7.74E-01
	Vanadium	9.28E-02	3.18E-02	7.15E-03	1.32E-01
	Zinc	1.44E+02	1.18E-01	1.18E-01	1.44E+02

Notes:
ECOPC - Ecological Chemical of Potential Concern
mg/kg BW/day - milligram per kilogram of body weight per day

TABLE 4-14
Tier 2 Exposure Estimates
Dinwoody

ECOPC	Receptor	Exposure (mg/kg BW/day)		
		Food	Soil	Total
Antimony	Northern Bobwhite	6.91E-03	1.82E-04	7.09E-03
	Eastern Cottontail	4.98E-03	1.43E-04	5.12E-03
	Mule Deer	3.26E-03	2.87E-05	3.29E-03
	American Robin	1.07E-02	2.58E-04	1.09E-02
	Coyote	1.61E-02	8.60E-05	1.62E-02
	Northern Harrier	5.23E-02	6.69E-05	5.24E-02
	Deer Mouse	1.13E-02	3.06E-04	1.16E-02
Arsenic	Northern Bobwhite	1.14E-02	8.62E-03	2.01E-02
	Eastern Cottontail	5.90E-03	6.80E-03	1.27E-02
	Mule Deer	3.87E-03	1.36E-03	5.23E-03
	American Robin	3.76E-02	1.22E-02	4.98E-02
	Coyote	4.14E-02	4.08E-03	4.55E-02
	Northern Harrier	1.34E-01	3.18E-03	1.38E-01
	Deer Mouse	3.60E-02	1.45E-02	5.05E-02
Barium	Northern Bobwhite	2.82E+00	4.25E-01	3.25E+00
	Eastern Cottontail	2.01E+00	3.36E-01	2.35E+00
	Mule Deer	1.32E+00	6.71E-02	1.39E+00
	American Robin	4.53E+00	6.04E-01	5.13E+00
	Coyote	2.58E-01	2.01E-01	4.59E-01
	Northern Harrier	6.63E-01	1.57E-01	8.19E-01
	Deer Mouse	4.74E+00	7.16E-01	5.46E+00
Boron	Northern Bobwhite	1.51E+00	4.32E-02	1.55E+00
	Eastern Cottontail	1.03E+00	3.41E-02	1.07E+00
	Mule Deer	6.76E-01	6.82E-03	6.83E-01
	American Robin	2.82E+00	6.14E-02	2.89E+00
	Coyote	9.88E-02	2.05E-02	1.19E-01
	Northern Harrier	2.11E-01	1.59E-02	2.27E-01
	Deer Mouse	2.89E+00	7.28E-02	2.96E+00
Cadmium	Northern Bobwhite	5.50E-02	1.21E-02	6.71E-02
	Eastern Cottontail	2.05E-02	9.56E-03	3.01E-02
	Mule Deer	1.34E-02	1.91E-03	1.54E-02
	American Robin	2.48E-01	1.72E-02	2.65E-01
	Coyote	1.10E-02	5.73E-03	1.67E-02
	Northern Harrier	2.65E-02	4.46E-03	3.10E-02
	Deer Mouse	2.32E-01	2.04E-02	2.52E-01
Cobalt	Northern Bobwhite	1.11E-02	2.27E-02	3.38E-02
	Eastern Cottontail	6.71E-03	1.79E-02	2.46E-02
	Mule Deer	4.40E-03	3.58E-03	7.98E-03
	American Robin	2.81E-02	3.22E-02	6.04E-02
	Coyote	3.93E-03	1.07E-02	1.47E-02
	Northern Harrier	1.18E-02	8.35E-03	2.02E-02
	Deer Mouse	2.77E-02	3.82E-02	6.59E-02

TABLE 4-14
Tier 2 Exposure Estimates
Dinwoody

ECOPC	Receptor	Exposure (mg/kg BW/day)		
		Food	Soil	Total
Copper	Northern Bobwhite	7.43E-01	5.05E-02	7.93E-01
	Eastern Cottontail	3.18E-01	3.99E-02	3.58E-01
	Mule Deer	2.09E-01	7.98E-03	2.17E-01
	American Robin	2.99E+00	7.18E-02	3.06E+00
	Coyote	1.09E+01	2.39E-02	1.09E+01
	Northern Harrier	3.57E+01	1.86E-02	3.57E+01
	Deer Mouse	2.82E+00	8.51E-02	2.91E+00
Lead	Northern Bobwhite	2.34E-02	3.10E-02	5.44E-02
	Eastern Cottontail	1.52E-02	2.45E-02	3.97E-02
	Mule Deer	9.96E-03	4.90E-03	1.49E-02
	American Robin	5.01E-02	4.41E-02	9.41E-02
	Coyote	1.51E+00	1.47E-02	1.53E+00
	Northern Harrier	4.97E+00	1.14E-02	4.98E+00
	Deer Mouse	5.03E-02	5.22E-02	1.03E-01
Manganese	Northern Bobwhite	1.54E+01	6.37E+00	2.18E+01
	Eastern Cottontail	9.03E+00	5.03E+00	1.41E+01
	Mule Deer	5.92E+00	1.01E+00	6.93E+00
	American Robin	4.15E+01	9.05E+00	5.05E+01
	Coyote	7.55E-01	3.02E+00	3.77E+00
	Northern Harrier	8.49E-01	2.35E+00	3.20E+00
	Deer Mouse	4.05E+01	1.07E+01	5.13E+01
Mercury	Northern Bobwhite	9.25E-04	7.22E-05	9.97E-04
	Eastern Cottontail	6.53E-04	5.70E-05	7.10E-04
	Mule Deer	4.28E-04	1.14E-05	4.39E-04
	American Robin	1.54E-03	1.03E-04	1.65E-03
	Coyote	1.56E-04	3.42E-05	1.90E-04
	Northern Harrier	4.49E-04	2.66E-05	4.75E-04
	Deer Mouse	1.61E-03	1.22E-04	1.73E-03
Molybdenum	Northern Bobwhite	3.91E-01	3.23E-03	3.94E-01
	Eastern Cottontail	2.76E-01	2.55E-03	2.79E-01
	Mule Deer	1.81E-01	5.11E-04	1.82E-01
	American Robin	6.46E-01	4.60E-03	6.51E-01
	Coyote	4.42E-02	1.53E-03	4.57E-02
	Northern Harrier	1.19E-01	1.19E-03	1.20E-01
	Deer Mouse	6.74E-01	5.45E-03	6.79E-01
Nickel	Northern Bobwhite	1.28E-01	7.41E-02	2.02E-01
	Eastern Cottontail	7.89E-02	5.85E-02	1.37E-01
	Mule Deer	5.17E-02	1.17E-02	6.34E-02
	American Robin	3.13E-01	1.05E-01	4.18E-01
	Coyote	7.56E-02	3.51E-02	1.11E-01
	Northern Harrier	2.36E-01	2.73E-02	2.63E-01
	Deer Mouse	3.09E-01	1.25E-01	4.34E-01

TABLE 4-14
Tier 2 Exposure Estimates
Dinwoody

ECOPC	Receptor	Exposure (mg/kg BW/day)		
		Food	Soil	Total
Selenium	Northern Bobwhite	1.05E-01	9.48E-04	1.06E-01
	Eastern Cottontail	1.27E-02	7.49E-04	1.34E-02
	Mule Deer	8.32E-03	1.50E-04	8.47E-03
	American Robin	6.99E-01	1.35E-03	7.00E-01
	Coyote	8.40E-02	4.49E-04	8.45E-02
	Northern Harrier	2.49E-01	3.49E-04	2.49E-01
	Deer Mouse	6.40E-01	1.60E-03	6.41E-01
Thallium	Northern Bobwhite	1.84E-03	5.36E-04	2.37E-03
	Eastern Cottontail	7.32E-04	4.23E-04	1.16E-03
	Mule Deer	4.80E-04	8.46E-05	5.65E-04
	American Robin	7.88E-03	7.61E-04	8.64E-03
	Coyote	7.70E-04	2.54E-04	1.02E-03
	Northern Harrier	2.22E-03	1.97E-04	2.42E-03
	Deer Mouse	7.39E-03	9.02E-04	8.30E-03
Uranium	Northern Bobwhite	3.39E-03	7.74E-03	1.11E-02
	Eastern Cottontail	2.20E-03	6.11E-03	8.31E-03
	Mule Deer	1.44E-03	1.22E-03	2.66E-03
	American Robin	7.35E-03	1.10E-02	1.84E-02
	Coyote	1.03E-03	3.67E-03	4.70E-03
	Northern Harrier	3.10E-03	2.85E-03	5.95E-03
	Deer Mouse	7.37E-03	1.30E-02	2.04E-02
Vanadium	Northern Bobwhite	4.38E-02	7.73E-02	1.21E-01
	Eastern Cottontail	2.48E-02	6.10E-02	8.58E-02
	Mule Deer	1.62E-02	1.22E-02	2.84E-02
	American Robin	1.26E-01	1.10E-01	2.36E-01
	Coyote	2.85E-02	3.66E-02	6.51E-02
	Northern Harrier	8.86E-02	2.85E-02	1.17E-01
	Deer Mouse	1.22E-01	1.30E-01	2.52E-01
Zinc	Northern Bobwhite	3.94E+00	2.34E-01	4.17E+00
	Eastern Cottontail	1.29E+00	1.85E-01	1.47E+00
	Mule Deer	8.44E-01	3.70E-02	8.81E-01
	American Robin	1.93E+01	3.33E-01	1.96E+01
	Coyote	1.30E+01	1.11E-01	1.31E+01
	Northern Harrier	4.20E+01	8.62E-02	4.21E+01
	Deer Mouse	1.80E+01	3.94E-01	1.83E+01

Notes:

ECOPC - Ecological Chemical of Potential Concern

mg/kg BW/day - milligram per kilogram of body weight per day

TABLE 4-15
Tier 2 Exposure Estimates
No Topsoil / No Chert

ECOPC	Receptor	Exposure (mg/kg BW/day)		
		Food	Soil	Total
Antimony	Northern Bobwhite	4.67E-03	6.12E-03	1.08E-02
	Eastern Cottontail	2.98E-03	4.83E-03	7.81E-03
	Mule Deer	1.95E-03	9.67E-04	2.92E-03
	American Robin	1.05E-02	8.70E-03	1.92E-02
	Coyote	3.61E-02	2.90E-03	3.90E-02
	Northern Harrier	1.18E-01	2.26E-03	1.20E-01
	Deer Mouse	1.05E-02	1.03E-02	2.08E-02
Arsenic	Northern Bobwhite	6.95E-02	3.84E-02	1.08E-01
	Eastern Cottontail	3.37E-02	3.03E-02	6.40E-02
	Mule Deer	2.21E-02	6.06E-03	2.81E-02
	American Robin	2.47E-01	5.45E-02	3.02E-01
	Coyote	5.24E-02	1.82E-02	7.06E-02
	Northern Harrier	1.62E-01	1.41E-02	1.77E-01
	Deer Mouse	2.35E-01	6.46E-02	3.00E-01
Barium	Northern Bobwhite	7.86E-01	1.75E-01	9.61E-01
	Eastern Cottontail	5.11E-01	1.38E-01	6.49E-01
	Mule Deer	3.35E-01	2.77E-02	3.62E-01
	American Robin	1.69E+00	2.49E-01	1.94E+00
	Coyote	2.41E-01	8.30E-02	3.24E-01
	Northern Harrier	7.26E-01	6.46E-02	7.90E-01
	Deer Mouse	1.69E+00	2.95E-01	1.99E+00
Boron	Northern Bobwhite	1.25E+00	7.99E-02	1.33E+00
	Eastern Cottontail	8.41E-01	6.31E-02	9.04E-01
	Mule Deer	5.51E-01	1.26E-02	5.64E-01
	American Robin	2.42E+00	1.14E-01	2.54E+00
	Coyote	1.09E-01	3.78E-02	1.46E-01
	Northern Harrier	2.59E-01	2.94E-02	2.89E-01
	Deer Mouse	2.47E+00	1.35E-01	2.60E+00
Cadmium	Northern Bobwhite	3.26E-01	7.43E-02	4.00E-01
	Eastern Cottontail	1.72E-01	5.86E-02	2.30E-01
	Mule Deer	1.13E-01	1.17E-02	1.24E-01
	American Robin	1.04E+00	1.06E-01	1.14E+00
	Coyote	4.63E-02	3.52E-02	8.15E-02
	Northern Harrier	1.12E-01	2.74E-02	1.39E-01
	Deer Mouse	9.99E-01	1.25E-01	1.12E+00
Copper	Northern Bobwhite	1.17E+00	1.59E-01	1.33E+00
	Eastern Cottontail	5.77E-01	1.25E-01	7.03E-01
	Mule Deer	3.79E-01	2.51E-02	4.04E-01
	American Robin	4.08E+00	2.26E-01	4.31E+00
	Coyote	1.45E+01	7.52E-02	1.46E+01
	Northern Harrier	4.76E+01	5.85E-02	4.76E+01
	Deer Mouse	3.89E+00	2.67E-01	4.16E+00

TABLE 4-15
Tier 2 Exposure Estimates
No Topsoil / No Chert

ECOPC	Receptor	Exposure (mg/kg BW/day)		
		Food	Soil	Total
Cobalt	Northern Bobwhite	5.67E-03	1.19E-02	1.75E-02
	Eastern Cottontail	2.40E-03	9.37E-03	1.18E-02
	Mule Deer	1.58E-03	1.87E-03	3.45E-03
	American Robin	2.30E-02	1.69E-02	3.99E-02
	Coyote	6.17E-03	5.62E-03	1.18E-02
	Northern Harrier	1.94E-02	4.37E-03	2.37E-02
	Deer Mouse	2.17E-02	2.00E-02	4.17E-02
Lead	Northern Bobwhite	1.97E-02	2.07E-02	4.04E-02
	Eastern Cottontail	1.18E-02	1.64E-02	2.82E-02
	Mule Deer	7.76E-03	3.27E-03	1.10E-02
	American Robin	5.06E-02	2.94E-02	8.00E-02
	Coyote	1.56E+01	9.81E-03	1.56E+01
	Northern Harrier	5.12E+01	7.63E-03	5.12E+01
	Deer Mouse	4.97E-02	3.49E-02	8.46E-02
Manganese	Northern Bobwhite	5.44E+00	3.19E+00	8.63E+00
	Eastern Cottontail	3.02E+00	2.52E+00	5.53E+00
	Mule Deer	1.98E+00	5.03E-01	2.48E+00
	American Robin	1.61E+01	4.53E+00	2.06E+01
	Coyote	5.83E-01	1.51E+00	2.09E+00
	Northern Harrier	1.28E+00	1.17E+00	2.46E+00
	Deer Mouse	1.56E+01	5.37E+00	2.10E+01
Mercury	Northern Bobwhite	9.51E-04	6.84E-04	1.63E-03
	Eastern Cottontail	5.49E-04	5.40E-04	1.09E-03
	Mule Deer	3.60E-04	1.08E-04	4.68E-04
	American Robin	2.63E-03	9.72E-04	3.60E-03
	Coyote	2.22E-04	3.24E-04	5.46E-04
	Northern Harrier	6.25E-04	2.52E-04	8.77E-04
	Deer Mouse	2.56E-03	1.15E-03	3.71E-03
Molybdenum	Northern Bobwhite	1.29E+00	3.77E-02	1.32E+00
	Eastern Cottontail	8.97E-01	2.98E-02	9.27E-01
	Mule Deer	5.88E-01	5.96E-03	5.94E-01
	American Robin	2.23E+00	5.36E-02	2.28E+00
	Coyote	7.86E-02	1.79E-02	9.65E-02
	Northern Harrier	1.68E-01	1.39E-02	1.82E-01
	Deer Mouse	2.30E+00	6.35E-02	2.37E+00
Nickel	Northern Bobwhite	5.59E-01	3.81E-01	9.40E-01
	Eastern Cottontail	3.59E-01	3.01E-01	6.60E-01
	Mule Deer	2.36E-01	6.01E-02	2.96E-01
	American Robin	1.24E+00	5.41E-01	1.78E+00
	Coyote	4.58E-01	1.80E-01	6.39E-01
	Northern Harrier	1.46E+00	1.40E-01	1.60E+00
	Deer Mouse	1.24E+00	6.41E-01	1.88E+00

TABLE 4-15
Tier 2 Exposure Estimates
No Topsoil / No Chert

ECOPC	Receptor	Exposure (mg/kg BW/day)		
		Food	Soil	Total
Selenium	Northern Bobwhite	3.16E+00	4.87E-02	3.21E+00
	Eastern Cottontail	1.80E+00	3.85E-02	1.84E+00
	Mule Deer	1.18E+00	7.70E-03	1.19E+00
	American Robin	8.89E+00	6.93E-02	8.96E+00
	Coyote	1.57E+00	2.31E-02	1.59E+00
	Northern Harrier	4.80E+00	1.80E-02	4.82E+00
	Deer Mouse	8.65E+00	8.21E-02	8.73E+00
Thallium	Northern Bobwhite	1.73E-02	2.33E-03	1.96E-02
	Eastern Cottontail	1.10E-02	1.84E-03	1.28E-02
	Mule Deer	7.20E-03	3.68E-04	7.57E-03
	American Robin	3.91E-02	3.31E-03	4.24E-02
	Coyote	3.29E-03	1.10E-03	4.39E-03
	Northern Harrier	9.26E-03	8.58E-04	1.01E-02
	Deer Mouse	3.89E-02	3.92E-03	4.29E-02
Uranium	Northern Bobwhite	1.05E-02	9.15E-02	1.02E-01
	Eastern Cottontail	8.54E-04	7.22E-02	7.31E-02
	Mule Deer	5.60E-04	1.44E-02	1.50E-02
	American Robin	7.33E-02	1.30E-01	2.03E-01
	Coyote	6.18E-03	4.33E-02	4.95E-02
	Northern Harrier	1.75E-02	3.37E-02	5.12E-02
	Deer Mouse	6.70E-02	1.54E-01	2.21E-01
Vanadium	Northern Bobwhite	9.48E-02	7.50E-01	8.45E-01
	Eastern Cottontail	2.54E-02	5.92E-01	6.18E-01
	Mule Deer	1.67E-02	1.18E-01	1.35E-01
	American Robin	5.11E-01	1.07E+00	1.58E+00
	Coyote	8.50E-02	3.55E-01	4.40E-01
	Northern Harrier	2.59E-01	2.76E-01	5.36E-01
	Deer Mouse	4.73E-01	1.26E+00	1.74E+00
Zinc	Northern Bobwhite	9.89E+00	1.74E+00	1.16E+01
	Eastern Cottontail	5.33E+00	1.37E+00	6.70E+00
	Mule Deer	3.49E+00	2.74E-01	3.77E+00
	American Robin	3.06E+01	2.47E+00	3.30E+01
	Coyote	2.74E+01	8.22E-01	2.82E+01
	Northern Harrier	8.87E+01	6.39E-01	8.94E+01
	Deer Mouse	2.95E+01	2.92E+00	3.24E+01

Notes:

ECOPC - Ecological Chemical of Potential Concern

mg/kg BW/day - milligram per kilogram of body weight per day

TABLE 4-16
Tier 2 Exposure Estimates
Topsoil Over Chert

ECOPC	Receptor	Exposure (mg/kg BW/day)		
		Food	Soil	Total
Antimony	Northern Bobwhite	1.21E-02	3.34E-03	1.55E-02
	Eastern Cottontail	4.07E-03	2.64E-03	6.71E-03
	Mule Deer	2.67E-03	5.27E-04	3.20E-03
	American Robin	5.84E-02	4.74E-03	6.31E-02
	Coyote	1.53E-02	1.58E-03	1.69E-02
	Northern Harrier	4.81E-02	1.23E-03	4.93E-02
	Deer Mouse	5.44E-02	5.62E-03	6.00E-02
Arsenic	Northern Bobwhite	1.06E-01	1.87E-02	1.25E-01
	Eastern Cottontail	1.43E-02	1.48E-02	2.91E-02
	Mule Deer	9.40E-03	2.96E-03	1.24E-02
	American Robin	6.94E-01	2.66E-02	7.21E-01
	Coyote	3.78E-02	8.87E-03	4.67E-02
	Northern Harrier	9.77E-02	6.90E-03	1.05E-01
	Deer Mouse	6.36E-01	3.15E-02	6.68E-01
Barium	Northern Bobwhite	2.53E+00	2.60E-01	2.80E+00
	Eastern Cottontail	8.16E-01	2.06E-01	1.02E+00
	Mule Deer	5.35E-01	4.11E-02	5.76E-01
	American Robin	1.25E+01	3.70E-01	1.29E+01
	Coyote	4.81E-01	1.23E-01	6.04E-01
	Northern Harrier	1.10E+00	9.60E-02	1.19E+00
	Deer Mouse	1.16E+01	4.39E-01	1.21E+01
Boron	Northern Bobwhite	1.04E+00	5.33E-02	1.09E+00
	Eastern Cottontail	6.82E-01	4.21E-02	7.24E-01
	Mule Deer	4.47E-01	8.42E-03	4.56E-01
	American Robin	2.18E+00	7.58E-02	2.26E+00
	Coyote	9.52E-02	2.53E-02	1.20E-01
	Northern Harrier	2.26E-01	1.96E-02	2.45E-01
	Deer Mouse	2.20E+00	8.98E-02	2.29E+00
Cadmium	Northern Bobwhite	2.27E-01	3.87E-02	2.66E-01
	Eastern Cottontail	5.58E-02	3.05E-02	8.64E-02
	Mule Deer	3.66E-02	6.11E-03	4.27E-02
	American Robin	1.27E+00	5.50E-02	1.33E+00
	Coyote	5.17E-02	1.83E-02	7.00E-02
	Northern Harrier	1.21E-01	1.43E-02	1.35E-01
	Deer Mouse	1.17E+00	6.52E-02	1.24E+00
Copper	Northern Bobwhite	9.93E-01	8.63E-02	1.08E+00
	Eastern Cottontail	4.16E-01	6.82E-02	4.84E-01
	Mule Deer	2.72E-01	1.36E-02	2.86E-01
	American Robin	4.09E+00	1.23E-01	4.21E+00
	Coyote	1.69E+01	4.09E-02	1.70E+01
	Northern Harrier	5.54E+01	3.18E-02	5.54E+01
	Deer Mouse	3.85E+00	1.45E-01	3.99E+00

TABLE 4-16
Tier 2 Exposure Estimates
Topsoil Over Chert

ECOPC	Receptor	Exposure (mg/kg BW/day)		
		Food	Soil	Total
Cobalt	Northern Bobwhite	1.09E-01	1.47E-02	1.23E-01
	Eastern Cottontail	5.23E-03	1.16E-02	1.68E-02
	Mule Deer	3.43E-03	2.32E-03	5.75E-03
	American Robin	7.89E-01	2.09E-02	8.10E-01
	Coyote	2.05E-02	6.97E-03	2.75E-02
	Northern Harrier	3.73E-02	5.42E-03	4.27E-02
	Deer Mouse	7.19E-01	2.48E-02	7.44E-01
Lead	Northern Bobwhite	1.67E-01	2.34E-02	1.90E-01
	Eastern Cottontail	5.55E-03	1.84E-02	2.40E-02
	Mule Deer	3.64E-03	3.69E-03	7.33E-03
	American Robin	1.23E+00	3.32E-02	1.27E+00
	Coyote	2.50E+00	1.11E-02	2.51E+00
	Northern Harrier	8.15E+00	8.60E-03	8.16E+00
	Deer Mouse	1.12E+00	3.93E-02	1.16E+00
Manganese	Northern Bobwhite	2.94E+01	3.05E+00	3.25E+01
	Eastern Cottontail	7.33E+00	2.41E+00	9.74E+00
	Mule Deer	4.81E+00	4.82E-01	5.29E+00
	American Robin	1.63E+02	4.34E+00	1.68E+02
	Coyote	3.45E+00	1.45E+00	4.90E+00
	Northern Harrier	5.07E+00	1.12E+00	6.19E+00
	Deer Mouse	1.51E+02	5.14E+00	1.56E+02
Mercury	Northern Bobwhite	1.94E-03	2.79E-04	2.22E-03
	Eastern Cottontail	4.09E-04	2.21E-04	6.29E-04
	Mule Deer	2.68E-04	4.41E-05	3.12E-04
	American Robin	1.14E-02	3.97E-04	1.18E-02
	Coyote	3.83E-04	1.32E-04	5.15E-04
	Northern Harrier	8.21E-04	1.03E-04	9.23E-04
	Deer Mouse	1.05E-02	4.70E-04	1.10E-02
Molybdenum	Northern Bobwhite	6.43E-01	1.61E-02	6.59E-01
	Eastern Cottontail	4.23E-01	1.27E-02	4.35E-01
	Mule Deer	2.77E-01	2.55E-03	2.80E-01
	American Robin	1.34E+00	2.29E-02	1.36E+00
	Coyote	5.96E-02	7.64E-03	6.72E-02
	Northern Harrier	1.42E-01	5.94E-03	1.48E-01
	Deer Mouse	1.35E+00	2.72E-02	1.38E+00
Nickel	Northern Bobwhite	1.13E+00	1.76E-01	1.30E+00
	Eastern Cottontail	1.84E-01	1.39E-01	3.23E-01
	Mule Deer	1.21E-01	2.78E-02	1.48E-01
	American Robin	7.07E+00	2.50E-01	7.32E+00
	Coyote	5.52E-01	8.33E-02	6.35E-01
	Northern Harrier	1.54E+00	6.48E-02	1.61E+00
	Deer Mouse	6.49E+00	2.96E-01	6.79E+00

TABLE 4-16
Tier 2 Exposure Estimates
Topsoil Over Chert

ECOPC	Receptor	Exposure (mg/kg BW/day)		
		Food	Soil	Total
Selenium	Northern Bobwhite	9.11E-01	1.52E-02	9.26E-01
	Eastern Cottontail	5.06E-01	1.20E-02	5.18E-01
	Mule Deer	3.32E-01	2.40E-03	3.34E-01
	American Robin	2.69E+00	2.16E-02	2.71E+00
	Coyote	8.10E-01	7.20E-03	8.17E-01
	Northern Harrier	2.55E+00	5.60E-03	2.56E+00
	Deer Mouse	2.60E+00	2.56E-02	2.63E+00
Thallium	Northern Bobwhite	1.08E-02	1.23E-03	1.21E-02
	Eastern Cottontail	2.97E-03	9.74E-04	3.94E-03
	Mule Deer	1.95E-03	1.95E-04	2.14E-03
	American Robin	5.79E-02	1.75E-03	5.97E-02
	Coyote	2.02E-03	5.84E-04	2.60E-03
	Northern Harrier	4.40E-03	4.54E-04	4.85E-03
	Deer Mouse	5.36E-02	2.08E-03	5.57E-02
Uranium	Northern Bobwhite	2.18E-01	3.29E-02	2.51E-01
	Eastern Cottontail	1.48E-03	2.60E-02	2.75E-02
	Mule Deer	9.68E-04	5.20E-03	6.16E-03
	American Robin	1.66E+00	4.68E-02	1.71E+00
	Coyote	3.37E-02	1.56E-02	4.93E-02
	Northern Harrier	4.73E-02	1.21E-02	5.95E-02
	Deer Mouse	1.51E+00	5.54E-02	1.57E+00
Vanadium	Northern Bobwhite	1.66E+00	3.40E-01	2.00E+00
	Eastern Cottontail	2.96E-02	2.69E-01	2.98E-01
	Mule Deer	1.94E-02	5.37E-02	7.31E-02
	American Robin	1.25E+01	4.84E-01	1.30E+01
	Coyote	2.73E-01	1.61E-01	4.34E-01
	Northern Harrier	4.18E-01	1.25E-01	5.44E-01
	Deer Mouse	1.14E+01	5.73E-01	1.20E+01
Zinc	Northern Bobwhite	7.79E+00	7.94E-01	8.58E+00
	Eastern Cottontail	2.34E+00	6.27E-01	2.96E+00
	Mule Deer	1.53E+00	1.25E-01	1.66E+00
	American Robin	3.99E+01	1.13E+00	4.10E+01
	Coyote	2.07E+01	3.76E-01	2.11E+01
	Northern Harrier	6.64E+01	2.93E-01	6.67E+01
	Deer Mouse	3.70E+01	1.34E+00	3.84E+01

Notes:

ECOPC - Ecological Chemical of Potential Concern

mg/kg BW/day - milligram per kilogram of body weight per day

TABLE 4-17
Tier 2 Exposure Estimates
Topsoil Only

ECOPC	Receptor	Exposure (mg/kg BW/day)		
		Food	Soil	Total
Antimony	Northern Bobwhite	9.57E-03	5.34E-03	1.49E-02
	Eastern Cottontail	6.65E-03	4.21E-03	1.09E-02
	Mule Deer	4.36E-03	8.42E-04	5.20E-03
	American Robin	1.69E-02	7.58E-03	2.44E-02
	Coyote	1.37E-02	2.53E-03	1.62E-02
	Northern Harrier	4.43E-02	1.97E-03	4.63E-02
	Deer Mouse	1.74E-02	8.99E-03	2.64E-02
Arsenic	Northern Bobwhite	4.91E-02	3.62E-02	8.53E-02
	Eastern Cottontail	2.62E-02	2.86E-02	5.48E-02
	Mule Deer	1.72E-02	5.71E-03	2.29E-02
	American Robin	1.54E-01	5.14E-02	2.05E-01
	Coyote	4.34E-02	1.71E-02	6.05E-02
	Northern Harrier	1.36E-01	1.33E-02	1.50E-01
	Deer Mouse	1.48E-01	6.09E-02	2.09E-01
Barium	Northern Bobwhite	8.48E-01	2.09E-01	1.06E+00
	Eastern Cottontail	5.39E-01	1.65E-01	7.04E-01
	Mule Deer	3.53E-01	3.30E-02	3.86E-01
	American Robin	1.92E+00	2.97E-01	2.22E+00
	Coyote	2.42E-01	9.90E-02	3.41E-01
	Northern Harrier	7.18E-01	7.70E-02	7.95E-01
	Deer Mouse	1.92E+00	3.52E-01	2.27E+00
Boron	Northern Bobwhite	1.14E+00	8.03E-02	1.22E+00
	Eastern Cottontail	7.53E-01	6.34E-02	8.16E-01
	Mule Deer	4.94E-01	1.27E-02	5.06E-01
	American Robin	2.35E+00	1.14E-01	2.46E+00
	Coyote	1.14E-01	3.81E-02	1.52E-01
	Northern Harrier	2.79E-01	2.96E-02	3.09E-01
	Deer Mouse	2.37E+00	1.35E-01	2.50E+00
Cadmium	Northern Bobwhite	2.95E-01	5.28E-02	3.48E-01
	Eastern Cottontail	1.43E-01	4.17E-02	1.84E-01
	Mule Deer	9.36E-02	8.34E-03	1.02E-01
	American Robin	1.05E+00	7.51E-02	1.12E+00
	Coyote	4.28E-02	2.50E-02	6.78E-02
	Northern Harrier	9.97E-02	1.95E-02	1.19E-01
	Deer Mouse	9.98E-01	8.90E-02	1.09E+00
Copper	Northern Bobwhite	9.74E-01	1.19E-01	1.09E+00
	Eastern Cottontail	4.66E-01	9.37E-02	5.60E-01
	Mule Deer	3.06E-01	1.87E-02	3.25E-01
	American Robin	3.50E+00	1.69E-01	3.67E+00
	Coyote	3.99E+01	5.62E-02	3.99E+01
	Northern Harrier	1.31E+02	4.37E-02	1.31E+02
	Deer Mouse	3.33E+00	2.00E-01	3.53E+00

TABLE 4-17
Tier 2 Exposure Estimates
Topsoil Only

ECOPC	Receptor	Exposure (mg/kg BW/day)		
		Food	Soil	Total
Cobalt	Northern Bobwhite	5.52E-03	1.21E-02	1.76E-02
	Eastern Cottontail	2.95E-03	9.56E-03	1.25E-02
	Mule Deer	1.94E-03	1.91E-03	3.85E-03
	American Robin	1.73E-02	1.72E-02	3.45E-02
	Coyote	6.86E-03	5.74E-03	1.26E-02
	Northern Harrier	2.18E-02	4.46E-03	2.63E-02
	Deer Mouse	1.66E-02	2.04E-02	3.70E-02
Lead	Northern Bobwhite	2.18E-02	2.05E-02	4.23E-02
	Eastern Cottontail	1.48E-02	1.62E-02	3.10E-02
	Mule Deer	9.72E-03	3.24E-03	1.30E-02
	American Robin	4.13E-02	2.91E-02	7.04E-02
	Coyote	1.10E+00	9.71E-03	1.11E+00
	Northern Harrier	3.60E+00	7.55E-03	3.61E+00
	Deer Mouse	4.21E-02	3.45E-02	7.67E-02
Manganese	Northern Bobwhite	6.99E+00	3.03E+00	1.00E+01
	Eastern Cottontail	4.29E+00	2.39E+00	6.68E+00
	Mule Deer	2.81E+00	4.79E-01	3.29E+00
	American Robin	1.72E+01	4.31E+00	2.15E+01
	Coyote	9.24E-01	1.44E+00	2.36E+00
	Northern Harrier	2.36E+00	1.12E+00	3.47E+00
	Deer Mouse	1.69E+01	5.11E+00	2.20E+01
Mercury	Northern Bobwhite	9.07E-04	4.58E-04	1.37E-03
	Eastern Cottontail	4.09E-04	3.62E-04	7.70E-04
	Mule Deer	2.68E-04	7.23E-05	3.40E-04
	American Robin	3.49E-03	6.51E-04	4.14E-03
	Coyote	2.10E-04	2.17E-04	4.27E-04
	Northern Harrier	5.54E-04	1.69E-04	7.22E-04
	Deer Mouse	3.30E-03	7.71E-04	4.07E-03
Molybdenum	Northern Bobwhite	1.02E+00	2.64E-02	1.04E+00
	Eastern Cottontail	6.97E-01	2.08E-02	7.17E-01
	Mule Deer	4.57E-01	4.16E-03	4.61E-01
	American Robin	1.87E+00	3.75E-02	1.90E+00
	Coyote	7.44E-02	1.25E-02	8.69E-02
	Northern Harrier	1.69E-01	9.72E-03	1.79E-01
	Deer Mouse	1.91E+00	4.44E-02	1.96E+00
Nickel	Northern Bobwhite	6.73E-01	2.89E-01	9.61E-01
	Eastern Cottontail	4.72E-01	2.28E-01	6.99E-01
	Mule Deer	3.09E-01	4.56E-02	3.55E-01
	American Robin	1.15E+00	4.10E-01	1.56E+00
	Coyote	5.93E-01	1.37E-01	7.29E-01
	Northern Harrier	1.90E+00	1.06E-01	2.01E+00
	Deer Mouse	1.19E+00	4.86E-01	1.68E+00

TABLE 4-17
Tier 2 Exposure Estimates
Topsoil Only

ECOPC	Receptor	Exposure (mg/kg BW/day)		
		Food	Soil	Total
Selenium	Northern Bobwhite	2.64E+00	1.41E-01	2.78E+00
	Eastern Cottontail	1.68E+00	1.11E-01	1.79E+00
	Mule Deer	1.10E+00	2.22E-02	1.12E+00
	American Robin	6.01E+00	2.00E-01	6.21E+00
	Coyote	1.36E+00	6.67E-02	1.42E+00
	Northern Harrier	4.22E+00	5.18E-02	4.27E+00
	Deer Mouse	5.99E+00	2.37E-01	6.22E+00
Thallium	Northern Bobwhite	1.06E-02	1.56E-03	1.22E-02
	Eastern Cottontail	7.32E-03	1.23E-03	8.55E-03
	Mule Deer	4.80E-03	2.47E-04	5.05E-03
	American Robin	1.92E-02	2.22E-03	2.14E-02
	Coyote	3.02E-03	7.40E-04	3.76E-03
	Northern Harrier	9.15E-03	5.75E-04	9.72E-03
	Deer Mouse	1.98E-02	2.63E-03	2.24E-02
Uranium	Northern Bobwhite	5.99E-03	5.32E-02	5.92E-02
	Eastern Cottontail	3.01E-03	4.20E-02	4.50E-02
	Mule Deer	1.98E-03	8.40E-03	1.04E-02
	American Robin	2.03E-02	7.56E-02	9.59E-02
	Coyote	5.22E-03	2.52E-02	3.04E-02
	Northern Harrier	1.64E-02	1.96E-02	3.60E-02
	Deer Mouse	1.94E-02	8.96E-02	1.09E-01
Vanadium	Northern Bobwhite	7.37E-02	3.82E-01	4.55E-01
	Eastern Cottontail	3.43E-02	3.01E-01	3.36E-01
	Mule Deer	2.25E-02	6.03E-02	8.28E-02
	American Robin	2.74E-01	5.42E-01	8.16E-01
	Coyote	6.60E-02	1.81E-01	2.47E-01
	Northern Harrier	2.06E-01	1.41E-01	3.47E-01
	Deer Mouse	2.60E-01	6.43E-01	9.03E-01
Zinc	Northern Bobwhite	9.47E+00	1.24E+00	1.07E+01
	Eastern Cottontail	4.79E+00	9.81E-01	5.77E+00
	Mule Deer	3.14E+00	1.96E-01	3.34E+00
	American Robin	3.19E+01	1.77E+00	3.37E+01
	Coyote	2.93E+01	5.89E-01	2.99E+01
	Northern Harrier	9.51E+01	4.58E-01	9.55E+01
	Deer Mouse	3.05E+01	2.09E+00	3.26E+01

Notes:

ECOPC - Ecological Chemical of Potential Concern

mg/kg BW/day - milligram per kilogram of body weight per day

TABLE 4-18
Database of TRVs for Wildlife ECOPCs

COI	Endpoint	TRV (mg/kg BW/day)	TRV Type	TRV Type Definition	Test Species	Source
Mammals						
Antimony	Lifespan/Longevity	1.25	LOAEL	Estimated Wildlife LOAEL	Mouse	USACHPPM
	Reproduction and growth	13.3	NOAEL	Geometric NOAEL for effects on reproduction and growth	Various	EcoSSL
	Reproduction, growth and survival	69.57	NOAEL	Geometric NOAEL for effects on reproduction, growth, and survival	Various	EcoSSL
	Body weight	0.51	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Rat	EcoSSL
Arsenic	Water intake, kidney weight/body weight ratio, state 3 respiration parameter	4.7	ECx	Dose at which adverse effects have been demonstrated	Rat	USACHPPM
	Reproduction	1.26	LOAEL	Estimated Wildlife LOAEL	Mouse	USACHPPM
	Reproduction and growth	2.47	NOAEL	Geometric NOAEL for effects on reproduction and growth	Various	EcoSSL
	Reproduction, growth and survival	2.87	NOAEL	Geometric NOAEL for effects on reproduction, growth, and survival	Various	EcoSSL
	Body weight	1.66	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Dog	EcoSSL
	Reproduction	1.26	LOAEL	Chronic LOAEL	Mouse	Sample et al. (1996)
Barium	Mortality	19.8	LOAEL	Estimated Wildlife LOAEL	Rat	USACHPPM
	Body weight	121	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Rat	EcoSSL
	Mortality	19.8	LOAEL	Chronic LOAEL	Rat	Sample et al. (1996)
Cadmium	Reproduction	10	LOAEL	Estimated Wildlife LOAEL	Rat	USACHPPM
	Young deaths and runts in F1 and F2 generations; failure to breed in F2B generation	2.64	ECx	Dose at which adverse effects have been demonstrated	Mouse	USACHPPM
	Reproduction and growth	1.86	NOAEL	Geometric NOAEL for effects on reproduction and growth	Various	EcoSSL
	Reproduction, growth and survival	2.32	NOAEL	Geometric NOAEL for effects on reproduction, growth, and survival		EcoSSL
	Body weight	0.909	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Sheep	EcoSSL
	Reproduction	10	LOAEL	Chronic LOAEL	Rat	Sample et al. (1996)
Chromium	Body weight	12	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Mouse	EcoSSL
	Mortality	13.14	LOAEL	Chronic LOAEL	Rat	Sample et al. (1996)
Copper	Water consumption, body weight, mortality	631.58	LOAEL	Dose at which adverse effects have been demonstrated	Mouse	USACHPPM
	Reproduction	15.14	LOAEL	Estimated Wildlife LOAEL	Mink	USACHPPM
	Reproduction and growth	24.96	NOAEL	Geometric NOAEL for effects on reproduction and growth	Various	EcoSSL
	Reproduction, growth and survival	37.89	NOAEL	Geometric NOAEL for effects on reproduction, growth, and survival	Various	EcoSSL
	Progeny number	6.79	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Mink	EcoSSL
	Reproduction	15.14	LOAEL	Chronic LOAEL	Mink	Sample et al. (1996)
Lead	Body weight, liver weight and kidney weight	241	ECx	Dose at which adverse effects have been demonstrated	Mouse	USACHPPM
	Reproduction	80	LOAEL	Estimated Wildlife LOAEL	Rat	USACHPPM
	Body weight	4.70	NOAEL	Highest bounded NOAEL below the lowest bounded LOAEL for results in the growth, reproduction, and survival effect groups	Rat	EcoSSL
	Reproduction and growth	40.73	NOAEL	Geometric NOAEL for effects on reproduction and growth	Various	EcoSSL
	Reproduction, growth and survival	46.98	NOAEL	Geometric NOAEL for effects on reproduction, growth, and survival	Various	EcoSSL
	Progeny weight; body weight	5	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Rat	EcoSSL
	Reproduction	80.00	LOAEL	Chronic LOAEL	Rat	Sample et al. (1996)
Manganese	Reproduction	284	LOAEL	Estimated Wildlife LOAEL	Rat	USACHPPM
	Paired testes weight, seminal vesicle weight, and preputial gland weight	159.09	ECx	Dose at which adverse effects have been demonstrated	Mouse	USACHPPM
	Body weight	65	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Cattle	EcoSSL
	Reproduction	284	LOAEL	Chronic LOAEL	Rat	Sample et al. (1996)
Molybdenum	Reproduction	2.6	LOAEL	Chronic LOAEL	Mouse	AWERA/ Sample et al. (1996)
Nickel	Reproduction	80	LOAEL	Estimated Wildlife LOAEL	Rat	USACHPPM
	Reproduction and growth	7.7	NOAEL	Geometric NOAEL for effects on reproduction and growth	Various	EcoSSL
	Reproduction, growth and survival	9.95	NOAEL	Geometric NOAEL for effects on reproduction, growth, and survival	Various	EcoSSL
	Sperm cell counts	2.71	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Mouse	EcoSSL
	Reproduction	80	LOAEL	Chronic LOAEL	Rat	Sample et al. (1996)

TABLE 4-18
Database of TRVs for Wildlife ECOPCs

COI	Endpoint	TRV (mg/kg BW/day)	TRV Type	TRV Type Definition	Test Species	Source
Selenium	Reproduction	0.33	LOAEL	Estimated Wildlife LOAEL	Rat	USACHPPM
	Number of young deaths and runts	1.21	ECx	Dose at which adverse effects have been demonstrated	Mouse	USACHPPM
	Body weight	0.143	NOAEL	Highest NOAEL value lower than the lowest LOAEL value for reproduction and growth	Pig	EcoSSL
	Reproduction and growth	0.437	NOAEL	Geometric NOAEL for effects on reproduction and growth	Various	EcoSSL
	Reproduction, growth and survival	0.543	NOAEL	Geometric NOAEL for effects on reproduction, growth, and survival	Various	EcoSSL
	Progeny weight	0.145	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Mouse	EcoSSL
	Reproduction	0.33	LOAEL	Chronic LOAEL	Rat	Sample et al. (1996)
Vanadium	Reproduction	2.1	LOAEL	Estimated Wildlife LOAEL	Rat	USACHPPM
	Reproduction; body weight; mortality	4.16	NOAEL	Highest bounded NOAEL lower than the lowest bounded LOAEL for reproduction, growth or survival	Mouse	EcoSSL
	Body weight	5.11	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Rat	EcoSSL
	Reproduction	2.1	LOAEL	Chronic LOAEL	Rat	Sample et al. (1996)
Zinc	Fetus weight, fetal liver weight, and body weight	411	LOAEL	Dose at which adverse effects have been demonstrated	Rat	USACHPPM
	Reproduction	320	LOAEL	Estimated Wildlife LOAEL	Rat	USACHPPM
	Reproduction and growth	75.37	NOAEL	Geometric NOAEL for effects on reproduction and growth	Various	EcoSSL
	Reproduction, growth and survival	86.83	NOAEL	Geometric NOAEL for effects on reproduction, growth, and survival	Various	EcoSSL
	Progeny weight	75.9	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Cattle	EcoSSL
	Reproduction	320	LOAEL	Chronic LOAEL	Rat	Sample et al. (1996)
Birds						
Arsenic	Mortality	7.38	LOAEL	Estimated Wildlife LOAEL	Brown-Headed Cowbird (Males only)	USACHPPM
	Mortality	12.84	LOAEL	Estimated Wildlife LOAEL	Mallard Duck	USACHPPM
	Liver weight, glycogen depletion, number of days between pairing and first egg, whole egg weight, duckling body and liver weights post-hatching, duckling growth rate, and duckling production	22.01	ECx	Dose at which adverse effects have been demonstrated	Mallard Duck	USACHPPM
	Mortality	7.38	LOAEL	Chronic LOAEL	Brown-headed Cowbird (Males only)	Sample et al. (1996)
	Mortality	12.84	LOAEL	Chronic LOAEL	Mallard Ducks	Sample et al. (1996)
Barium	Mortality	41.7	LOAEL	Estimated Wildlife LOAEL	1-Day Old Chick	USACHPPM
	Mortality	41.7	LOAEL	Chronic LOAEL	1 Day Old Chicks	Sample et al. (1996)
Cadmium	Reproduction	20	LOAEL	Estimated Wildlife LOAEL	Mallard Duck	USACHPPM
	Body and testis weight, hematocrit and hemoglobin; changes in liver trace element stores; histological effects to duodenum, bone marrow, and adrenal; heart weight	10.43	ECx	Dose at which adverse effects have been demonstrated	Japanese Quail Hatchling	USACHPPM
	Reproduction, growth and survival	2.37	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Chicken	EcoSSL
	Reproduction	20	NOAEL	Chronic NOAEL	Mallard Ducks	Sample et al. (1996)
Chromium	Reproductive success; mortality	2.78	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Black Duck	EcoSSL
	Reproduction	5	LOAEL	Chronic LOAEL	Black Duck	Sample et al. (1996)
Chromium (III)	Reproduction	5	LOAEL	Estimated Wildlife LOAEL	Black Duck	USACHPPM
Copper	Growth, mortality	61.7	LOAEL	Estimated Wildlife LOAEL	1-Day Old Chick	USACHPPM
	Gizzard erosion, feed to gain ratio, increase in relative gizzard and proventriculus weight	52.26	ECx	Dose at which adverse effects have been demonstrated	Broiler Chick	USACHPPM
	Reproduction and growth	18.5	NOAEL	Geometric NOAEL for effects on reproduction and growth	Various	EcoSSL
	Reproduction, growth and survival	19.8	NOAEL	Geometric NOAEL for effects on reproduction, growth, and survival	Various	EcoSSL
	Body weight	4.68	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Turkey	EcoSSL
	Growth, mortality	61.7	LOAEL	Chronic LOAEL	1-Day Old Chicks	Sample et al. (1996)

TABLE 4-18
Database of TRVs for Wildlife ECOPCs

COI	Endpoint	TRV (mg/kg BW/day)	TRV Type	TRV Type Definition	Test Species	Source
Lead	Reproduction	11.3	LOAEL	Estimated Wildlife LOAEL	Japanese Quail	USACHPPM
	Egg production	8.75	ECx	Dose at which adverse effects have been demonstrated	Chicken	USACHPPM
	Reproduction and growth	10.94	NOAEL	Geometric NOAEL for effects on reproduction and growth	Various	EcoSSL
	Reproduction, growth and survival	16.93	NOAEL	Geometric NOAEL for effects on reproduction, growth, and survival	Various	EcoSSL
	Reproduction	1.94	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Japanese Quail	EcoSSL
	Progeny counts	0.194	NOAEL	NOAEL associated with lowest bounded LOAEL for reproduction, growth and survival	Japanese Quail	EcoSSL
	Reproduction	11.3	LOAEL	Chronic LOAEL	Japanese Quail	Sample et al. (1996)
Manganese	Rate of motor development and aggressive behavior	776	ECx	Dose at which adverse effects have been demonstrated	Japanese Quail Hatchling	USACHPPM
	Growth, aggressive behavior	997	LOAEL	Estimated Wildlife LOAEL	Japanese Quail	USACHPPM
	Body weight	348	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Chicken	EcoSSL
Molybdenum	Reproduction	35.3	LOAEL	Chronic LOAEL	Chicken	AWERA/ Sample et al. (1996)
Nickel	Length: weight ratio of humerus at 30 days	55.26	LOAEL	Dose at which adverse effects have been demonstrated	Mallard Duckling	USACHPPM
	Mortality, growth, behavior	107	LOAEL	Estimated Wildlife LOAEL	Mallard Duckling	USACHPPM
	Body weight	11.5	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Chicken	EcoSSL
	Mortality, growth, behavior	107	LOAEL	Chronic LOAEL	Mallard Duckling	Sample et al. (1996)
Selenium	Reproduction	1	LOAEL	Estimated Wildlife LOAEL	Mallard Duck	USACHPPM
	Reproduction	0.8	LOAEL	Estimated Wildlife LOAEL	Mallard Duck	USACHPPM
	Reproduction	1.5	LOAEL	Estimated Wildlife LOAEL	Screech Owl	USACHPPM
	Hatching success	0.93	LOAEL	Dose at which adverse effects have been demonstrated	Mallard Duck	USACHPPM
	Reproduction and growth	0.61	NOAEL	Geometric NOAEL for effects on reproduction and growth	Various	EcoSSL
	Reproduction, growth and survival	0.85	NOAEL	Geometric NOAEL for effects on reproduction, growth, and survival	NA	EcoSSL
	Egg weight	0.368	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Chicken	EcoSSL
	Reproduction	1	LOAEL	Chronic LOAEL	Mallard Duckling	Sample et al. (1996)
	Reproduction	0.8	LOAEL	Chronic LOAEL	Mallard Duck	Sample et al. (1996)
	Reproduction	1.5	LOAEL	Chronic LOAEL	Screech Owl	Sample et al. (1996)
Vanadium	Reproduction and growth	1.19	NOAEL	Geometric NOAEL for effects on reproduction and growth	Various	EcoSSL
	Reproduction, growth and survival	1.9	NOAEL	Geometric NOAEL for effects on reproduction, growth, and survival	Various	EcoSSL
	Egg quality	0.413	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Chicken	EcoSSL
	Mortality, body weight, blood chemistry	11.4	NOAEL	Chronic NOAEL	Mallard Duck	Sample et al. (1996)
Zinc	Body weight, reproductive and pancreatic effects	172	ECx	Dose at which adverse effects have been demonstrated	Mallard Duck	USACHPPM
	Reproduction	131	LOAEL	Estimated Wildlife LOAEL	White Leghorn Hen	USACHPPM
	Progeny count	66.5	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival	Chicken	EcoSSL
	Progeny count	79.8	LOAEL	Lowest bounded LOAEL for reproduction, growth and survival; Revised TRV based on recalculation of study data.	Chicken	EcoSSL
	Reproduction	131	LOAEL	Chronic LOAEL	White Leghorn Hen	Sample et al. (1996)

Notes:

COI - Chemical of Interest, TRV - Toxicity Reference Value, LOAEL - Lowest-Observable Adverse Effects Levels, NOAEL - No-Observed Adverse Effects Levels, mg/kg BW/day - milligram per kilogram of body weight per day

USACHPPM - USACHPMM Terrestrial Toxicity Database - U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM). 2009. Directorate of Toxicology Downloads, USACHPPM TRV database. Available at http://chppm-www.apgea.army.mil/tox/download.aspx. Accessed October 2009.

EcoSSL - U.S. Environmental Protection Agency (USEPA). 2005. Guidance for Developing Ecological Soil Screening Levels (EcoSSLs). EPA Office of Solid Waste and Emergency Response (OSWER), OSWER Directive 9285.7-55. Published November 2003, Revised November 2005 and subsequent contaminant-specific EcoSSL documents. In cases where the lowest bounded LOAEL is less than the geometric mean NOAEL, both values are presented.

Sample et al. (1996) - Sample, B.E., D.M. Opresko, and G.W Suter II, 1996. Toxicological Benchmarks for Wildlife: 1996 Revision. Oak Ridge National Laboratory, Oak Ridge, TN. 227 pp. ES/ER/TM-86/R3.

AWERA - Unadjusted values from AWERA Work Plan 2002 - TetraTech EM, Inc. (TTEMI). 2002. Final Area Wide Human Health and Ecological Risk Assessment Work Plan, Selenium Project, Southeast Idaho Phosphate Mining Resource Area. Prepared for Idaho Department of Environmental Quality by TetraTech EM, Inc., April, 2002.

TABLE 4-19
Tier 1 Hazard Quotient Calculations Using NOAEL TRVs

ECOPC	Receptor	Exposure (mg/kg BW/day)				TRV (mg/kg BW/day)	Hazard Quotient
		Food	Soil	Surface Water	Total		
Antimony	Eastern Cottontail	3.94E-03	2.62E-03	2.51E-05	6.59E-03	0.059	1.1E-01
	American Robin	1.01E-02	4.72E-03	3.57E-05	1.49E-02	N/A	N/A
	Northern Harrier	5.49E-02	1.22E-03	1.92E-05	5.61E-02	N/A	N/A
	Northern Bobwhite	5.69E-03	3.32E-03	2.64E-05	9.04E-03	N/A	N/A
	Coyote	1.68E-02	1.57E-03	2.02E-05	1.84E-02	0.059	3.1E-01
	Deer Mouse	1.04E-02	5.60E-03	3.78E-05	1.60E-02	0.059	2.7E-01
	Mule Deer	2.58E-03	5.25E-04	1.71E-05	3.13E-03	0.059	5.3E-02
Arsenic	Mule Deer	1.27E-02	3.99E-03	1.81E-03	1.85E-02	1.04	1.8E-02
	Coyote	2.65E-02	1.20E-02	2.14E-03	4.06E-02	1.04	3.9E-02
	Eastern Cottontail	1.93E-02	1.99E-02	2.66E-03	4.19E-02	1.04	4.0E-02
	Deer Mouse	1.56E-01	4.25E-02	4.00E-03	2.03E-01	1.04	1.9E-01
	American Robin	1.65E-01	3.59E-02	3.78E-03	2.05E-01	2.24	9.1E-02
	Northern Bobwhite	4.29E-02	2.53E-02	2.79E-03	7.10E-02	2.24	3.2E-02
	Northern Harrier	8.07E-02	9.30E-03	2.03E-03	9.21E-02	2.24	4.1E-02
Cadmium	Northern Harrier	7.95E-02	1.49E-02	4.61E-04	9.49E-02	1.47	6.5E-02
	Mule Deer	6.00E-02	6.40E-03	4.11E-04	6.68E-02	0.77	8.7E-02
	Coyote	3.25E-02	1.92E-02	4.86E-04	5.22E-02	0.77	6.8E-02
	Eastern Cottontail	9.15E-02	3.20E-02	6.04E-04	1.24E-01	0.77	1.6E-01
	American Robin	7.03E-01	5.76E-02	8.60E-04	7.61E-01	1.47	5.2E-01
	Deer Mouse	6.68E-01	6.83E-02	9.10E-04	7.37E-01	0.77	9.6E-01
	Northern Bobwhite	1.93E-01	4.05E-02	6.35E-04	2.34E-01	1.47	1.6E-01
Chromium	Northern Harrier	3.74E-01	2.01E-01	2.01E-03	5.78E-01	2.66	2.2E-01
	Deer Mouse	4.93E-01	9.19E-01	3.97E-03	1.42E+00	9.24	1.5E-01
	American Robin	5.18E-01	7.76E-01	3.75E-03	1.30E+00	2.66	4.9E-01
	Coyote	1.20E-01	2.59E-01	2.12E-03	3.81E-01	9.24	4.1E-02
	Northern Bobwhite	1.45E-01	5.46E-01	2.77E-03	6.93E-01	2.66	2.6E-01
	Mule Deer	4.56E-02	8.62E-02	1.80E-03	1.34E-01	9.24	1.4E-02
	Eastern Cottontail	6.96E-02	4.31E-01	2.64E-03	5.03E-01	9.24	5.4E-02

TABLE 4-19
Tier 1 Hazard Quotient Calculations Using NOAEL TRVs

ECOPC	Receptor	Exposure (mg/kg BW/day)				TRV (mg/kg BW/day)	Hazard Quotient
		Food	Soil	Surface Water	Total		
Copper	Coyote	1.64E+01	4.12E-02	3.03E-04	1.65E+01	5.6	2.9E+00
	Mule Deer	2.82E-01	1.37E-02	2.56E-04	2.96E-01	5.6	5.3E-02
	American Robin	3.33E+00	1.24E-01	5.35E-04	3.45E+00	4.04	8.5E-01
	Eastern Cottontail	4.31E-01	6.87E-02	3.76E-04	5.00E-01	5.6	8.9E-02
	Deer Mouse	3.16E+00	1.47E-01	5.66E-04	3.31E+00	5.6	5.9E-01
	Northern Bobwhite	9.11E-01	8.70E-02	3.96E-04	9.99E-01	4.04	2.5E-01
	Northern Harrier	5.38E+01	3.21E-02	2.87E-04	5.38E+01	4.04	1.3E+01
Lead	Mule Deer	4.64E-03	3.74E-03	5.75E-05	8.44E-03	4.7	1.8E-03
	Eastern Cottontail	7.08E-03	1.87E-02	8.45E-05	2.59E-02	4.7	5.5E-03
	Northern Bobwhite	1.31E-02	2.37E-02	8.88E-05	3.68E-02	1.63	2.3E-02
	American Robin	4.02E-02	3.36E-02	1.20E-04	7.40E-02	1.63	4.5E-02
	Northern Harrier	6.37E+00	8.72E-03	6.45E-05	6.38E+00	1.63	3.9E+00
	Deer Mouse	3.88E-02	3.99E-02	1.27E-04	7.88E-02	4.7	1.7E-02
	Coyote	1.94E+00	1.12E-02	6.79E-05	1.95E+00	4.7	4.2E-01
Manganese	Eastern Cottontail	6.61E+00	2.48E+00	2.60E-02	9.11E+00	51.5	1.8E-01
	Northern Harrier	1.70E+00	1.16E+00	1.98E-02	2.88E+00	179	1.6E-02
	Northern Bobwhite	1.06E+01	3.14E+00	2.73E-02	1.38E+01	179	7.7E-02
	Mule Deer	4.33E+00	4.97E-01	1.77E-02	4.85E+00	51.5	9.4E-02
	Deer Mouse	2.49E+01	5.30E+00	3.91E-02	3.02E+01	51.5	5.9E-01
	American Robin	2.51E+01	4.47E+00	3.70E-02	2.96E+01	179	1.7E-01
	Coyote	8.21E-01	1.49E+00	2.09E-02	2.33E+00	51.5	4.5E-02
Molybdenum	Eastern Cottontail	4.39E-01	1.26E-02	4.79E-03	4.56E-01	0.26	1.8E+00
	Coyote	5.42E-02	7.58E-03	3.85E-03	6.56E-02	0.26	2.5E-01
	American Robin	1.13E+00	2.28E-02	6.82E-03	1.16E+00	3.5	3.3E-01
	Northern Harrier	1.33E-01	5.90E-03	3.66E-03	1.42E-01	3.5	4.1E-02
	Northern Bobwhite	6.34E-01	1.60E-02	5.04E-03	6.55E-01	3.5	1.9E-01
	Deer Mouse	1.16E+00	2.70E-02	7.21E-03	1.20E+00	0.26	4.6E+00
	Mule Deer	2.88E-01	2.53E-03	3.26E-03	2.94E-01	0.26	1.1E+00

TABLE 4-19
Tier 1 Hazard Quotient Calculations Using NOAEL TRVs

ECOPC	Receptor	Exposure (mg/kg BW/day)				TRV (mg/kg BW/day)	Hazard Quotient
		Food	Soil	Surface Water	Total		
Nickel	Mule Deer	1.71E-01	3.36E-02	4.98E-03	2.09E-01	1.7	1.2E-01
	Eastern Cottontail	2.61E-01	1.68E-01	7.31E-03	4.36E-01	1.7	2.6E-01
	Deer Mouse	7.68E-01	3.58E-01	1.10E-02	1.14E+00	1.7	6.7E-01
	Northern Bobwhite	3.87E-01	2.13E-01	7.69E-03	6.08E-01	6.71	9.1E-02
	American Robin	7.56E-01	3.02E-01	1.04E-02	1.07E+00	6.71	1.6E-01
	Northern Harrier	9.86E-01	7.84E-02	5.58E-03	1.07E+00	6.71	1.6E-01
	Coyote	3.10E-01	1.01E-01	5.88E-03	4.16E-01	1.7	2.4E-01
Selenium	Eastern Cottontail	1.19E+00	3.11E-02	4.97E-02	1.27E+00	0.143	8.9E+00
	Northern Bobwhite	1.90E+00	3.94E-02	5.22E-02	1.99E+00	0.29	6.9E+00
	Mule Deer	7.80E-01	6.22E-03	3.38E-02	8.20E-01	0.143	5.7E+00
	American Robin	4.47E+00	5.60E-02	7.07E-02	4.60E+00	0.29	1.6E+01
	Deer Mouse	4.44E+00	6.63E-02	7.48E-02	4.58E+00	0.143	3.2E+01
	Coyote	9.24E-01	1.87E-02	3.99E-02	9.82E-01	0.143	6.9E+00
	Northern Harrier	2.86E+00	1.45E-02	3.79E-02	2.91E+00	0.29	1.0E+01
Vanadium	Deer Mouse	2.52E-01	5.59E-01	3.11E-03	8.14E-01	4.16	2.0E-01
	Northern Bobwhite	6.24E-02	3.32E-01	2.17E-03	3.96E-01	0.344	1.2E+00
	Northern Harrier	1.55E-01	1.22E-01	1.58E-03	2.79E-01	0.344	8.1E-01
	Eastern Cottontail	2.47E-02	2.62E-01	2.07E-03	2.89E-01	4.16	6.9E-02
	Coyote	5.05E-02	1.57E-01	1.66E-03	2.09E-01	4.16	5.0E-02
	Mule Deer	1.62E-02	5.24E-02	1.41E-03	7.00E-02	4.16	1.7E-02
	American Robin	2.69E-01	4.71E-01	2.94E-03	7.43E-01	0.344	2.2E+00
Zinc	American Robin	2.56E+01	1.35E+00	3.55E-02	2.70E+01	66.1	4.1E-01
	Northern Harrier	8.45E+01	3.50E-01	1.90E-02	8.48E+01	66.1	1.3E+00
	Northern Bobwhite	7.18E+00	9.50E-01	2.62E-02	8.16E+00	66.1	1.2E-01
	Coyote	2.60E+01	4.50E-01	2.00E-02	2.65E+01	75.4	3.5E-01
	Mule Deer	2.27E+00	1.50E-01	1.70E-02	2.44E+00	75.4	3.2E-02
	Deer Mouse	2.44E+01	1.60E+00	3.75E-02	2.60E+01	75.4	3.5E-01
	Eastern Cottontail	3.47E+00	7.50E-01	2.49E-02	4.24E+00	75.4	5.6E-02

Notes:

ECOPC - Ecological Chemical of Potential Concern

mg/kg BW/day - milligram per kilogram of body weight per day

NOAEL - No-Observed Adverse Effects Level

TRV - Toxicity Reference Value

TABLE 4-20
Tier 1 Hazard Quotient Calculations Using the Lowest LOAEL TRV

ECOPC	Receptor	Exposure (mg/kg BW/day)				TRV (mg/kg BW/day)	Hazard Quotient
		Food	Soil	Surface Water	Total		
Copper	Coyote	1.64E+01	4.12E-02	3.03E-04	1.65E+01	6.79E+00	2.4E+00
	Northern Harrier	5.38E+01	3.21E-02	2.87E-04	5.38E+01	4.68E+00	1.1E+01
Lead	Northern Harrier	6.37E+00	8.72E-03	6.45E-05	6.38E+00	1.94E+00	3.3E+00
Molybdenum	Deer Mouse	1.16E+00	2.70E-02	7.21E-03	1.20E+00	2.60E+00	4.6E-01
	Eastern Cottontail	4.39E-01	1.26E-02	4.79E-03	4.56E-01	2.60E+00	1.8E-01
	Mule Deer	2.88E-01	2.53E-03	3.26E-03	2.94E-01	2.60E+00	1.1E-01
Selenium	American Robin	4.47E+00	5.60E-02	7.07E-02	4.60E+00	3.68E-01	1.2E+01
	Coyote	9.24E-01	1.87E-02	3.99E-02	9.82E-01	1.45E-01	6.8E+00
	Deer Mouse	4.44E+00	6.63E-02	7.48E-02	4.58E+00	1.45E-01	3.2E+01
	Eastern Cottontail	1.19E+00	3.11E-02	4.97E-02	1.27E+00	1.45E-01	8.8E+00
	Mule Deer	7.80E-01	6.22E-03	3.38E-02	8.20E-01	1.45E-01	5.7E+00
	Northern Bobwhite	1.90E+00	3.94E-02	5.22E-02	1.99E+00	3.68E-01	5.4E+00
	Northern Harrier	2.86E+00	1.45E-02	3.79E-02	2.91E+00	3.68E-01	7.9E+00
Vanadium	American Robin	2.69E-01	4.71E-01	2.94E-03	7.43E-01	4.13E-01	1.8E+00
	Northern Bobwhite	6.24E-02	3.32E-01	2.17E-03	3.96E-01	4.13E-01	9.6E-01
Zinc	Northern Harrier	8.45E+01	3.50E-01	1.90E-02	8.48E+01	6.65E+01	1.3E+00

Notes:

ECOPC - Ecological Chemical of Potential Concern

mg/kg BW/day - milligram per kilogram of body weight per day

LOAEL - Lowest Observed Adverse Effects Level

TRV - Toxicity Reference Value

TABLE 4-21
Tier 1 Soil EPCs Compared to Plant and Invertebrate Screening Benchmarks

Analyte	Tier 1 Surface Soil EPC (mg/kg)	Plant	Invertebrate
		Screening Benchmark (mg/kg)	Screening Benchmark (mg/kg)
Antimony	1.75	5	78
Arsenic	13.3	18	60
Barium	141	500	330
Boron	**28.8**	0.5	NA
Cadmium	21.3	32	140
Chromium	**287**	1	0.4
Cobalt	7.42	13	NA
Copper	45.8	70	80
Lead	12.5	120	1,700
Manganese	**1660**	220	450
Mercury	**0.145**	0.3	0.1
Molybdenum	**8.43**	2	NA
Nickel	**112**	38	280
Selenium	**20.7**	0.52	4.1
Thallium	0.709	1	NA
Uranium	20.1	250	100
Vanadium	**175**	2	NA
Zinc	**500**	160	120

Notes:

Bold = Exceeds one or more benchmarks

EPC - Exposure Point Concentration

mg/kg - milligram per kilogram

TABLE 4-22
Riparian and Seep Location Hazard Quotients Using the Lowest LOAEL TRVs

ECOPC	Receptor	Location	Exposure Food (mg/kg BW/day)	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg BW/day)	Exposure Total (mg/kg BW/day)	TRV (mg/kg BW/day)	HQ
Cadmium	Deer Mouse	DS-7	1.24E+00	1.36E-01	2.07E-03	1.38E+00	9.09E-01	1.5E+00
		ES-3	5.05E-01	1.89E-02	4.75E-04	5.24E-01	9.09E-01	5.8E-01
		ES-4	2.64E-01	1.63E-02	4.75E-04	2.80E-01	9.09E-01	3.1E-01
		HS-3	1.95E-01	5.12E-03	5.26E-06	2.00E-01	9.09E-01	2.2E-01
		HS-CC1	3.67E-01	5.76E-03	5.26E-06	3.73E-01	9.09E-01	4.1E-01
		HS-CC2	3.86E-01	8.32E-03	5.26E-06	3.94E-01	9.09E-01	4.3E-01
		LP-PD	3.86E-01	8.96E-03	5.26E-06	3.95E-01	9.09E-01	4.3E-01
		LS	4.45E-01	6.72E-03	7.30E-06	4.52E-01	9.09E-01	5.0E-01
		LSm	5.39E-01	1.28E-02	2.41E-05	5.52E-01	9.09E-01	6.1E-01
		LSS	6.25E-01	5.98E-02	4.88E-05	6.85E-01	9.09E-01	7.5E-01
Chromium	Song Sparrow	DS-7	1.92E-01	3.17E+00	1.34E-03	3.37E+00	2.78E+00	1.2E+00
		ES-3	3.12E-01	2.70E-01	8.57E-03	5.91E-01	2.78E+00	2.1E-01
		ES-4	7.20E-02	2.43E-01	8.57E-03	3.23E-01	2.78E+00	1.2E-01
		HS-3	9.60E-02	7.39E-02	1.60E-04	1.70E-01	2.78E+00	6.1E-02
		HS-CC1	7.20E-02	1.84E-01	1.50E-04	2.56E-01	2.78E+00	9.2E-02
		HS-CC2	4.80E-02	1.77E-01	1.50E-04	2.25E-01	2.78E+00	8.1E-02
		LP-PD	1.92E-01	1.48E-01	1.03E-04	3.40E-01	2.78E+00	1.2E-01
		LS	1.68E-01	1.55E-01	2.79E-04	3.23E-01	2.78E+00	1.2E-01
		LSm	1.44E-01	2.10E-01	5.95E-04	3.54E-01	2.78E+00	1.3E-01
		LSS	7.20E-02	3.56E-01	1.20E-03	4.29E-01	2.78E+00	1.5E-01
Copper	Coyote	DS-7	1.37E+01	1.01E-01	1.21E-04	1.38E+01	6.79E+00	2.0E+00
		ES-3	3.07E+00	1.67E-02	6.32E-04	3.09E+00	6.79E+00	4.6E-01
		ES-4	9.29E+00	1.18E-02	6.32E-04	9.30E+00	6.79E+00	1.4E+00
		HS-3	4.46E+01	9.09E-03	1.95E-05	4.46E+01	6.79E+00	6.6E+00
		HS-CC1	8.02E+00	1.97E-02	6.01E-04	8.04E+00	6.79E+00	1.2E+00
		HS-CC2	8.02E+00	1.32E-02	6.01E-04	8.03E+00	6.79E+00	1.2E+00
		LP-PD	6.33E-01	1.53E-02	4.76E-05	6.49E-01	6.79E+00	9.6E-02
		LS	7.74E+00	1.32E-02	4.76E-05	7.75E+00	6.79E+00	1.1E+00
		LSm	1.33E+00	2.00E-02	9.59E-05	1.35E+00	6.79E+00	2.0E-01
		LSS	2.64E+01	2.90E-02	1.97E-04	2.64E+01	6.79E+00	3.9E+00
Copper	Northern Harrier	DS-7	4.49E+01	7.84E-02	1.15E-04	4.50E+01	4.68E+00	9.6E+00
		ES-3	9.96E+00	1.30E-02	5.99E-04	9.97E+00	4.68E+00	2.1E+00
		ES-4	3.04E+01	9.17E-03	5.99E-04	3.04E+01	4.68E+00	6.5E+00
		HS-3	1.46E+02	7.07E-03	1.85E-05	1.46E+02	4.68E+00	3.1E+01
		HS-CC1	2.62E+01	1.53E-02	5.71E-04	2.62E+01	4.68E+00	5.6E+00
		HS-CC2	2.62E+01	1.03E-02	5.71E-04	2.62E+01	4.68E+00	5.6E+00
		LP-PD	1.94E+00	1.19E-02	4.51E-05	1.95E+00	4.68E+00	4.2E-01
		LS	2.53E+01	1.03E-02	4.51E-05	2.53E+01	4.68E+00	5.4E+00
		LSm	4.22E+00	1.55E-02	9.10E-05	4.24E+00	4.68E+00	9.1E-01
		LSS	8.64E+01	2.25E-02	1.87E-04	8.65E+01	4.68E+00	1.8E+01

TABLE 4-22
Riparian and Seep Location Hazard Quotients Using the Lowest LOAEL TRVs

ECOPC	Receptor	Location	Exposure Food (mg/kg BW/day)	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg BW/day)	Exposure Total (mg/kg BW/day)	TRV (mg/kg BW/day)	HQ
Lead	Northern Harrier	DS-7	7.63E-01	8.26E-03	2.29E-05	7.71E-01	1.94E+00	4.0E-01
		ES-3	5.66E-01	8.61E-03	1.55E-04	5.75E-01	1.94E+00	3.0E-01
		ES-4	9.04E-01	6.51E-03	1.55E-04	9.11E-01	1.94E+00	4.7E-01
		HS-3	2.61E+00	6.93E-03	3.18E-06	2.62E+00	1.94E+00	1.4E+00
		HS-CC1	7.27E-01	1.11E-02	1.92E-06	7.38E-01	1.94E+00	3.8E-01
		HS-CC2	7.27E-01	7.91E-03	1.92E-06	7.35E-01	1.94E+00	3.8E-01
		LP-PD	1.78E-01	8.33E-03	1.57E-05	1.86E-01	1.94E+00	9.6E-02
		LS	1.12E+01	7.42E-03	2.55E-05	1.12E+01	1.94E+00	5.8E+00
		LSm	1.66E-01	8.82E-03	3.21E-05	1.75E-01	1.94E+00	9.0E-02
		LSS	2.14E+00	1.52E-02	1.01E-04	2.15E+00	1.94E+00	1.1E+00
Manganese	Meadow Vole	DS-7	4.46E+01	1.46E+00	5.95E-02	4.61E+01	6.50E+01	7.1E-01
		ES-3	4.53E+01	2.47E+00	1.93E-02	4.78E+01	6.50E+01	7.4E-01
		ES-4	9.72E+00	2.33E+00	1.93E-02	1.21E+01	6.50E+01	1.9E-01
		HS-3	9.78E+01	1.08E+00	3.73E-04	9.89E+01	6.50E+01	1.5E+00
		HS-CC1	4.30E+01	7.13E+00	1.93E-04	5.01E+01	6.50E+01	7.7E-01
		HS-CC2	5.32E+01	4.80E+00	1.93E-04	5.80E+01	6.50E+01	8.9E-01
		LP-PD	1.79E+01	5.83E+00	2.57E-03	2.37E+01	6.50E+01	3.7E-01
		LS	3.02E+01	4.72E+00	7.95E-03	3.50E+01	6.50E+01	5.4E-01
		LSm	4.98E+01	6.10E+00	2.34E-02	5.59E+01	6.50E+01	8.6E-01
		LSS	8.00E+01	9.29E+00	2.19E-02	8.93E+01	6.50E+01	1.4E+00
Molybdenum	Meadow Vole	DS-7	1.16E+00	1.30E-01	6.32E-03	1.30E+00	2.60E+00	5.0E-01
		ES-3	1.40E+00	1.62E-02	4.82E-04	1.42E+00	2.60E+00	5.5E-01
		ES-4	1.82E-01	1.13E-02	4.82E-04	1.94E-01	2.60E+00	7.5E-02
		HS-3	2.44E-01	2.43E-02	3.17E-04	2.69E-01	2.60E+00	1.0E-01
		HS-CC1	4.13E-01	1.19E-02	3.51E-04	4.25E-01	2.60E+00	1.6E-01
		HS-CC2	8.61E-01	7.02E-03	3.51E-04	8.69E-01	2.60E+00	3.3E-01
		LP-PD	3.63E+00	7.02E-03	4.00E-05	3.64E+00	2.60E+00	1.4E+00
		LS	1.51E-01	2.92E-03	3.45E-05	1.54E-01	2.60E+00	5.9E-02
		LSm	1.44E-01	2.86E-03	8.65E-05	1.47E-01	2.60E+00	5.7E-02
		LSS	4.94E-01	2.97E-02	1.79E-04	5.24E-01	2.60E+00	2.0E-01
Selenium	American Robin	DS-7	1.27E+01	2.36E-01	4.48E-01	1.34E+01	3.68E-01	3.6E+01
		ES-3	2.11E-01	3.24E-03	7.96E-04	2.15E-01	3.68E-01	5.8E-01
		ES-4	3.59E+01	2.66E-01	7.96E-04	3.62E+01	3.68E-01	9.8E+01
		HS-3	7.38E-01	1.27E-02	1.01E-02	7.61E-01	3.68E-01	2.1E+00
		HS-CC1	4.31E-01	2.27E-02	1.24E-02	4.66E-01	3.68E-01	1.3E+00
		HS-CC2	6.98E-01	4.32E-03	1.24E-02	7.15E-01	3.68E-01	1.9E+00
		LP-PD	5.44E+00	1.51E-03	4.83E-05	5.45E+00	3.68E-01	1.5E+01
		LS	2.27E-01	1.49E-03	4.14E-05	2.28E-01	3.68E-01	6.2E-01
		LSm	1.54E-01	1.49E-03	1.20E-04	1.56E-01	3.68E-01	4.2E-01
		LSS	6.36E-01	2.81E-02	2.50E-03	6.67E-01	3.68E-01	1.8E+00

TABLE 4-22
Riparian and Seep Location Hazard Quotients Using the Lowest LOAEL TRVs

ECOPC	Receptor	Location	Exposure Food (mg/kg BW/day)	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg BW/day)	Exposure Total (mg/kg BW/day)	TRV (mg/kg BW/day)	HQ
Selenium	Belted Kingfisher	DS-7	N/C	N/C	3.57E-01	3.57E-01	3.68E-01	9.7E-01
		ES-3	N/C	N/C	6.35E-04	6.35E-04	3.68E-01	1.7E-03
		ES-4	N/C	N/C	6.35E-04	6.35E-04	3.68E-01	1.7E-03
		HS-3	1.29E+00	1.16E-02	8.02E-03	1.31E+00	3.68E-01	3.6E+00
		HS-CC1	1.29E+00	9.24E-03	9.87E-03	1.31E+00	3.68E-01	3.6E+00
		HS-CC2	1.29E+00	1.76E-03	9.87E-03	1.30E+00	3.68E-01	3.5E+00
		LP-PD	N/C	1.47E-02	3.85E-05	1.48E-02	3.68E-01	4.0E-02
		LS	2.73E-01	7.15E-04	3.30E-05	2.74E-01	3.68E-01	7.4E-01
		LSm	3.45E-01	6.82E-04	9.57E-05	3.46E-01	3.68E-01	9.4E-01
		LSS	9.44E-01	2.09E-03	1.99E-03	9.48E-01	3.68E-01	2.6E+00
Selenium	Coyote	DS-7	1.09E+00	7.88E-02	2.53E-01	1.42E+00	1.45E-01	9.8E+00
		ES-3	5.90E-02	1.08E-03	4.50E-04	6.05E-02	1.45E-01	4.2E-01
		ES-4	3.42E+00	8.88E-02	4.50E-04	3.50E+00	1.45E-01	2.4E+01
		HS-3	3.17E-01	4.23E-03	5.69E-03	3.27E-01	1.45E-01	2.3E+00
		HS-CC1	1.44E-01	7.56E-03	7.00E-03	1.59E-01	1.45E-01	1.1E+00
		HS-CC2	1.50E-01	1.44E-03	7.00E-03	1.58E-01	1.45E-01	1.1E+00
		LP-PD	4.58E-01	5.04E-04	2.73E-05	4.59E-01	1.45E-01	3.2E+00
		LS	5.57E-02	4.95E-04	2.34E-05	5.63E-02	1.45E-01	3.9E-01
		LSm	2.13E-02	4.95E-04	6.79E-05	2.18E-02	1.45E-01	1.5E-01
		LSS	1.03E-01	9.36E-03	1.41E-03	1.14E-01	1.45E-01	7.9E-01
Selenium	Deer Mouse	DS-7	1.22E+01	2.80E-01	4.73E-01	1.29E+01	1.45E-01	8.9E+01
		ES-3	1.95E-01	3.84E-03	8.42E-04	2.00E-01	1.45E-01	1.4E+00
		ES-4	3.55E+01	3.16E-01	8.42E-04	3.58E+01	1.45E-01	2.5E+02
		HS-3	6.77E-01	1.50E-02	1.06E-02	7.03E-01	1.45E-01	4.8E+00
		HS-CC1	4.01E-01	2.69E-02	1.31E-02	4.41E-01	1.45E-01	3.0E+00
		HS-CC2	6.42E-01	5.12E-03	1.31E-02	6.60E-01	1.45E-01	4.6E+00
		LP-PD	5.75E+00	1.79E-03	5.11E-05	5.75E+00	1.45E-01	4.0E+01
		LS	2.10E-01	1.76E-03	4.38E-05	2.12E-01	1.45E-01	1.5E+00
		LSm	1.42E-01	1.76E-03	1.27E-04	1.44E-01	1.45E-01	9.9E-01
		LSS	5.95E-01	3.33E-02	2.64E-03	6.31E-01	1.45E-01	4.4E+00
Selenium	Eastern Cottontail	DS-7	2.11E+00	1.31E-01	3.15E-01	2.56E+00	1.45E-01	1.8E+01
		ES-3	1.04E-02	1.80E-03	5.60E-04	1.27E-02	1.45E-01	8.8E-02
		ES-4	9.09E+00	1.48E-01	5.60E-04	9.24E+00	1.45E-01	6.4E+01
		HS-3	1.71E-02	7.05E-03	7.07E-03	3.12E-02	1.45E-01	2.2E-01
		HS-CC1	3.05E-02	1.26E-02	8.70E-03	5.18E-02	1.45E-01	3.6E-01
		HS-CC2	2.14E-02	2.40E-03	8.70E-03	3.25E-02	1.45E-01	2.2E-01
		LP-PD	2.56E+00	8.40E-04	3.40E-05	2.56E+00	1.45E-01	1.8E+01
		LS	1.10E-02	8.25E-04	2.91E-05	1.18E-02	1.45E-01	8.2E-02
		LSm	5.49E-03	8.25E-04	8.44E-05	6.40E-03	1.45E-01	4.4E-02
		LSS	5.12E-02	1.56E-02	1.76E-03	6.86E-02	1.45E-01	4.7E-01

TABLE 4-22
Riparian and Seep Location Hazard Quotients Using the Lowest LOAEL TRVs

ECOPC	Receptor	Location	Exposure Food (mg/kg BW/day)	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg BW/day)	Exposure Total (mg/kg BW/day)	TRV (mg/kg BW/day)	HQ
Selenium	Mallard	DS-7	N/C	N/C	1.85E-01	1.85E-01	3.68E-01	5.0E-01
		ES-3	N/C	N/C	3.29E-04	3.29E-04	3.68E-01	8.9E-04
		ES-4	N/C	N/C	3.29E-04	3.29E-04	3.68E-01	8.9E-04
		HS-3	1.74E+00	2.42E-02	4.16E-03	1.77E+00	3.68E-01	4.8E+00
		HS-CC1	1.74E+00	1.93E-02	5.11E-03	1.77E+00	3.68E-01	4.8E+00
		HS-CC2	1.56E+00	3.68E-03	5.11E-03	1.56E+00	3.68E-01	4.3E+00
		LP-PD	1.18E+00	3.08E-02	2.00E-05	1.21E+00	3.68E-01	3.3E+00
		LS	5.59E-01	1.50E-03	1.71E-05	5.60E-01	3.68E-01	1.5E+00
		LSm	2.18E-01	1.43E-03	4.96E-05	2.19E-01	3.68E-01	6.0E-01
		LSS	9.66E-01	4.37E-03	1.03E-03	9.71E-01	3.68E-01	2.6E+00
Selenium	Meadow Vole	DS-7	1.10E+01	4.73E-01	4.48E-01	1.20E+01	1.45E-01	8.3E+01
		ES-3	6.31E-02	6.48E-03	7.96E-04	7.03E-02	1.45E-01	4.9E-01
		ES-4	4.65E+01	5.33E-01	7.96E-04	4.70E+01	1.45E-01	3.2E+02
		HS-3	1.27E-01	2.54E-02	1.01E-02	1.62E-01	1.45E-01	1.1E+00
		HS-CC1	1.74E-01	4.54E-02	1.24E-02	2.32E-01	1.45E-01	1.6E+00
		HS-CC2	1.45E-01	8.64E-03	1.24E-02	1.66E-01	1.45E-01	1.1E+00
		LP-PD	1.28E+01	3.02E-03	4.83E-05	1.28E+01	1.45E-01	8.8E+01
		LS	6.70E-02	2.97E-03	4.14E-05	7.00E-02	1.45E-01	4.8E-01
		LSm	3.59E-02	2.97E-03	1.20E-04	3.90E-02	1.45E-01	2.7E-01
		LSS	2.88E-01	5.62E-02	2.50E-03	3.46E-01	1.45E-01	2.4E+00
Selenium	Mink	DS-7	7.37E-02	4.11E-01	3.24E-01	8.09E-01	1.45E-01	5.6E+00
		ES-3	7.64E-04	5.64E-03	5.77E-04	6.98E-03	1.45E-01	4.8E-02
		ES-4	3.10E-01	4.64E-01	5.77E-04	7.74E-01	1.45E-01	5.3E+00
		HS-3	9.37E-01	4.68E-02	7.29E-03	9.91E-01	1.45E-01	6.8E+00
		HS-CC1	9.37E-01	5.92E-02	8.97E-03	1.00E+00	1.45E-01	6.9E+00
		HS-CC2	9.15E-01	1.13E-02	8.97E-03	9.35E-01	1.45E-01	6.5E+00
		LP-PD	1.71E-01	3.41E-02	3.50E-05	2.05E-01	1.45E-01	1.4E+00
		LS	2.12E-01	4.11E-03	3.00E-05	2.17E-01	1.45E-01	1.5E+00
		LSm	2.32E-01	4.04E-03	8.70E-05	2.36E-01	1.45E-01	1.6E+00
		LSS	6.66E-01	5.33E-02	1.81E-03	7.21E-01	1.45E-01	5.0E+00
Selenium	Mule Deer	DS-7	1.38E+00	2.63E-02	2.14E-01	1.62E+00	1.45E-01	1.1E+01
		ES-3	6.80E-03	3.60E-04	3.81E-04	7.54E-03	1.45E-01	5.2E-02
		ES-4	5.96E+00	2.96E-02	3.81E-04	5.99E+00	1.45E-01	4.1E+01
		HS-3	1.12E-02	1.41E-03	4.81E-03	1.74E-02	1.45E-01	1.2E-01
		HS-CC1	2.00E-02	2.52E-03	5.92E-03	2.84E-02	1.45E-01	2.0E-01
		HS-CC2	1.40E-02	4.80E-04	5.92E-03	2.04E-02	1.45E-01	1.4E-01
		LP-PD	1.68E+00	1.68E-04	2.31E-05	1.68E+00	1.45E-01	1.2E+01
		LS	7.20E-03	1.65E-04	1.98E-05	7.38E-03	1.45E-01	5.1E-02
		LSm	3.60E-03	1.65E-04	5.74E-05	3.82E-03	1.45E-01	2.6E-02
		LSS	3.36E-02	3.12E-03	1.19E-03	3.79E-02	1.45E-01	2.6E-01

TABLE 4-22
Riparian and Seep Location Hazard Quotients Using the Lowest LOAEL TRVs

ECOPC	Receptor	Location	Exposure Food (mg/kg BW/day)	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg BW/day)	Exposure Total (mg/kg BW/day)	TRV (mg/kg BW/day)	HQ
Selenium	Northern Bobwhite	DS-7	3.99E+00	1.66E-01	3.31E-01	4.49E+00	3.68E-01	1.2E+01
		ES-3	3.90E-02	2.28E-03	5.89E-04	4.19E-02	3.68E-01	1.1E-01
		ES-4	1.48E+01	1.88E-01	5.89E-04	1.49E+01	3.68E-01	4.1E+01
		HS-3	1.15E-01	8.93E-03	7.44E-03	1.31E-01	3.68E-01	3.6E-01
		HS-CC1	8.99E-02	1.60E-02	9.15E-03	1.15E-01	3.68E-01	3.1E-01
		HS-CC2	1.15E-01	3.04E-03	9.15E-03	1.27E-01	3.68E-01	3.4E-01
		LP-PD	3.55E+00	1.06E-03	3.57E-05	3.55E+00	3.68E-01	9.7E+00
		LS	4.17E-02	1.05E-03	3.06E-05	4.28E-02	3.68E-01	1.2E-01
		LSm	2.62E-02	1.05E-03	8.87E-05	2.73E-02	3.68E-01	7.4E-02
		LSS	1.40E-01	1.98E-02	1.85E-03	1.61E-01	3.68E-01	4.4E-01
Selenium	Northern Harrier	DS-7	3.07E+00	6.13E-02	2.40E-01	3.37E+00	3.68E-01	9.2E+00
		ES-3	1.85E-01	8.40E-04	4.27E-04	1.87E-01	3.68E-01	5.1E-01
		ES-4	9.79E+00	6.91E-02	4.27E-04	9.86E+00	3.68E-01	2.7E+01
		HS-3	1.01E+00	3.29E-03	5.39E-03	1.02E+00	3.68E-01	2.8E+00
		HS-CC1	4.58E-01	5.88E-03	6.64E-03	4.70E-01	3.68E-01	1.3E+00
		HS-CC2	4.64E-01	1.12E-03	6.64E-03	4.72E-01	3.68E-01	1.3E+00
		LP-PD	1.28E+00	3.92E-04	2.59E-05	1.28E+00	3.68E-01	3.5E+00
		LS	1.74E-01	3.85E-04	2.22E-05	1.75E-01	3.68E-01	4.7E-01
		LSm	6.39E-02	3.85E-04	6.44E-05	6.43E-02	3.68E-01	1.7E-01
		LSS	3.14E-01	7.28E-03	1.34E-03	3.23E-01	3.68E-01	8.8E-01
Selenium	Raccoon	DS-7	3.00E-01	2.10E-01	2.66E-01	7.76E-01	1.45E-01	5.4E+00
		ES-3	5.37E-03	2.88E-03	4.73E-04	8.72E-03	1.45E-01	6.0E-02
		ES-4	1.22E+00	2.37E-01	4.73E-04	1.46E+00	1.45E-01	1.0E+01
		HS-3	4.21E-01	2.39E-02	5.98E-03	4.50E-01	1.45E-01	3.1E+00
		HS-CC1	4.09E-01	3.02E-02	7.36E-03	4.47E-01	1.45E-01	3.1E+00
		HS-CC2	3.35E-01	5.76E-03	7.36E-03	3.48E-01	1.45E-01	2.4E+00
		LP-PD	5.75E-01	1.74E-02	2.87E-05	5.93E-01	1.45E-01	4.1E+00
		LS	1.31E-01	2.10E-03	2.46E-05	1.33E-01	1.45E-01	9.2E-01
		LSm	5.27E-02	2.06E-03	7.13E-05	5.48E-02	1.45E-01	3.8E-01
		LSS	2.48E-01	2.72E-02	1.48E-03	2.77E-01	1.45E-01	1.9E+00
Selenium	Red-Winged Blackbird	DS-7	7.31E+00	2.80E-01	5.42E-01	8.13E+00	3.68E-01	2.2E+01
		ES-3	8.46E-02	3.84E-03	9.64E-04	8.95E-02	3.68E-01	2.4E-01
		ES-4	2.54E+01	3.16E-01	9.64E-04	2.57E+01	3.68E-01	7.0E+01
		HS-3	2.67E-01	1.50E-02	1.22E-02	2.95E-01	3.68E-01	8.0E-01
		HS-CC1	1.87E-01	2.69E-02	1.50E-02	2.28E-01	3.68E-01	6.2E-01
		HS-CC2	2.61E-01	5.12E-03	1.50E-02	2.81E-01	3.68E-01	7.6E-01
		LP-PD	5.61E+00	1.79E-03	5.85E-05	5.62E+00	3.68E-01	1.5E+01
		LS	9.07E-02	1.76E-03	5.01E-05	9.25E-02	3.68E-01	2.5E-01
		LSm	5.88E-02	1.76E-03	1.45E-04	6.07E-02	3.68E-01	1.6E-01
		LSS	2.85E-01	3.33E-02	3.02E-03	3.21E-01	3.68E-01	8.7E-01

TABLE 4-22
Riparian and Seep Location Hazard Quotients Using the Lowest LOAEL TRVs

ECOPC	Receptor	Location	Exposure Food (mg/kg BW/day)	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg BW/day)	Exposure Total (mg/kg BW/day)	TRV (mg/kg BW/day)	HQ
Selenium	Song Sparrow	DS-7	8.30E+00	4.20E-01	6.65E-01	9.39E+00	3.68E-01	2.6E+01
		ES-3	4.08E-02	5.76E-03	1.18E-03	4.77E-02	3.68E-01	1.3E-01
		ES-4	3.58E+01	4.74E-01	1.18E-03	3.62E+01	3.68E-01	9.8E+01
		HS-3	6.72E-02	2.26E-02	1.49E-02	1.05E-01	3.68E-01	2.8E-01
		HS-CC1	1.20E-01	4.03E-02	1.84E-02	1.79E-01	3.68E-01	4.9E-01
		HS-CC2	8.40E-02	7.68E-03	1.84E-02	1.10E-01	3.68E-01	3.0E-01
		LP-PD	1.01E+01	2.69E-03	7.18E-05	1.01E+01	3.68E-01	2.7E+01
		LS	4.32E-02	2.64E-03	6.15E-05	4.59E-02	3.68E-01	1.2E-01
		LSm	2.16E-02	2.64E-03	1.78E-04	2.44E-02	3.68E-01	6.6E-02
		LSS	2.02E-01	4.99E-02	3.71E-03	2.55E-01	3.68E-01	6.9E-01
Vanadium	American Robin	DS-7	5.15E-01	6.78E-01	2.70E-03	1.19E+00	4.13E-01	2.9E+00
		ES-3	1.04E+00	1.42E-01	6.83E-03	1.19E+00	4.13E-01	2.9E+00
		ES-4	1.12E-01	1.17E-01	6.83E-03	2.36E-01	4.13E-01	5.7E-01
		HS-3	1.91E-01	5.51E-02	2.72E-04	2.46E-01	4.13E-01	6.0E-01
		HS-CC1	6.83E-02	4.37E-02	2.48E-04	1.12E-01	4.13E-01	2.7E-01
		HS-CC2	5.36E-02	1.08E-01	2.48E-04	1.62E-01	4.13E-01	3.9E-01
		LP-PD	1.12E-01	8.96E-02	1.57E-04	2.02E-01	4.13E-01	4.9E-01
		LS	8.72E-02	9.50E-02	2.17E-04	1.82E-01	4.13E-01	4.4E-01
		LSm	7.56E-02	1.33E-01	5.13E-04	2.09E-01	4.13E-01	5.1E-01
		LSS	8.82E-02	3.08E-01	8.74E-04	3.97E-01	4.13E-01	9.6E-01
Vanadium	Belted Kingfisher	DS-7	N/C	N/C	2.16E-03	2.16E-03	4.13E-01	5.2E-03
		ES-3	N/C	N/C	5.45E-03	5.45E-03	4.13E-01	1.3E-02
		ES-4	N/C	N/C	5.45E-03	5.45E-03	4.13E-01	1.3E-02
		HS-3	4.67E-02	3.80E-02	2.17E-04	8.48E-02	4.13E-01	2.1E-01
		HS-CC1	4.67E-02	1.78E-02	1.98E-04	6.47E-02	4.13E-01	1.6E-01
		HS-CC2	4.67E-02	4.39E-02	1.98E-04	9.08E-02	4.13E-01	2.2E-01
		LP-PD	N/C	6.92E-02	1.25E-04	6.93E-02	4.13E-01	1.7E-01
		LS	3.51E-02	3.03E-02	1.73E-04	6.55E-02	4.13E-01	1.6E-01
		LSm	7.15E-02	3.26E-02	4.09E-04	1.04E-01	4.13E-01	2.5E-01
		LSS	3.82E-02	3.77E-02	6.96E-04	7.66E-02	4.13E-01	1.9E-01
Vanadium	Mallard	DS-7	N/C	N/C	1.12E-03	1.12E-03	4.13E-01	2.7E-03
		ES-3	N/C	N/C	2.82E-03	2.82E-03	4.13E-01	6.8E-03
		ES-4	N/C	N/C	2.82E-03	2.82E-03	4.13E-01	6.8E-03
		HS-3	2.90E-01	7.94E-02	1.12E-04	3.69E-01	4.13E-01	8.9E-01
		HS-CC1	2.21E-01	3.73E-02	1.03E-04	2.59E-01	4.13E-01	6.3E-01
		HS-CC2	2.22E-01	9.18E-02	1.03E-04	3.14E-01	4.13E-01	7.6E-01
		LP-PD	1.02E+00	1.45E-01	6.50E-05	1.16E+00	4.13E-01	2.8E+00
		LS	1.15E+00	6.33E-02	8.95E-05	1.21E+00	4.13E-01	2.9E+00
		LSm	8.40E-01	6.81E-02	2.12E-04	9.08E-01	4.13E-01	2.2E+00
		LSS	6.36E-01	7.89E-02	3.61E-04	7.15E-01	4.13E-01	1.7E+00

TABLE 4-22
Riparian and Seep Location Hazard Quotients Using the Lowest LOAEL TRVs

ECOPC	Receptor	Location	Exposure Food (mg/kg BW/day)	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg BW/day)	Exposure Total (mg/kg BW/day)	TRV (mg/kg BW/day)	HQ
Vanadium	Northern Harrier	DS-7	9.98E-02	1.76E-01	1.45E-03	2.77E-01	4.13E-01	6.7E-01
		ES-3	1.05E-01	3.68E-02	3.66E-03	1.45E-01	4.13E-01	3.5E-01
		ES-4	6.55E-02	3.02E-02	3.66E-03	9.94E-02	4.13E-01	2.4E-01
		HS-3	2.95E-02	1.43E-02	1.46E-04	4.39E-02	4.13E-01	1.1E-01
		HS-CC1	3.33E-02	1.13E-02	1.33E-04	4.48E-02	4.13E-01	1.1E-01
		HS-CC2	3.31E-02	2.79E-02	1.33E-04	6.12E-02	4.13E-01	1.5E-01
		LP-PD	7.63E-02	2.32E-02	8.44E-05	9.96E-02	4.13E-01	2.4E-01
		LS	4.72E-02	2.46E-02	1.16E-04	7.20E-02	4.13E-01	1.7E-01
		LSm	4.21E-02	3.44E-02	2.75E-04	7.68E-02	4.13E-01	1.9E-01
		LSS	6.20E-02	7.98E-02	4.68E-04	1.42E-01	4.13E-01	3.4E-01
Vanadium	Red-Winged Blackbird	DS-7	2.25E-01	8.03E-01	3.27E-03	1.03E+00	4.13E-01	2.5E+00
		ES-3	4.16E-01	1.68E-01	8.27E-03	5.92E-01	4.13E-01	1.4E+00
		ES-4	5.60E-02	1.38E-01	8.27E-03	2.02E-01	4.13E-01	4.9E-01
		HS-3	7.90E-02	6.53E-02	3.29E-04	1.45E-01	4.13E-01	3.5E-01
		HS-CC1	3.97E-02	5.18E-02	3.01E-04	9.18E-02	4.13E-01	2.2E-01
		HS-CC2	3.03E-02	1.28E-01	3.01E-04	1.58E-01	4.13E-01	3.8E-01
		LP-PD	5.50E-02	1.06E-01	1.90E-04	1.61E-01	4.13E-01	3.9E-01
		LS	5.32E-02	1.13E-01	2.62E-04	1.66E-01	4.13E-01	4.0E-01
		LSm	4.76E-02	1.57E-01	6.21E-04	2.06E-01	4.13E-01	5.0E-01
		LSS	5.08E-02	3.65E-01	1.06E-03	4.17E-01	4.13E-01	1.0E+00
Vanadium	Song Sparrow	DS-7	1.49E-01	1.20E+00	4.02E-03	1.36E+00	4.13E-01	3.3E+00
		ES-3	1.99E-01	2.52E-01	1.01E-02	4.62E-01	4.13E-01	1.1E+00
		ES-4	5.04E-02	2.07E-01	1.01E-02	2.68E-01	4.13E-01	6.5E-01
		HS-3	4.32E-02	9.79E-02	4.04E-04	1.42E-01	4.13E-01	3.4E-01
		HS-CC1	4.56E-02	7.78E-02	3.69E-04	1.24E-01	4.13E-01	3.0E-01
		HS-CC2	3.36E-02	1.92E-01	3.69E-04	2.25E-01	4.13E-01	5.5E-01
		LP-PD	4.80E-02	1.59E-01	2.34E-04	2.08E-01	4.13E-01	5.0E-01
		LS	6.48E-02	1.69E-01	3.22E-04	2.34E-01	4.13E-01	5.7E-01
		LSm	6.00E-02	2.36E-01	7.63E-04	2.97E-01	4.13E-01	7.2E-01
		LSS	5.76E-02	5.47E-01	1.30E-03	6.06E-01	4.13E-01	1.5E+00
Zinc	Northern Harrier	DS-7	1.05E+02	8.68E-01	4.01E-02	1.06E+02	6.65E+01	1.6E+00
		ES-3	9.15E+01	1.05E-01	1.46E-02	9.16E+01	6.65E+01	1.4E+00
		ES-4	7.17E+01	8.33E-02	1.46E-02	7.18E+01	6.65E+01	1.1E+00
		HS-3	6.07E+01	3.75E-02	2.16E-04	6.07E+01	6.65E+01	9.1E-01
		HS-CC1	4.27E+01	4.49E-02	4.48E-04	4.27E+01	6.65E+01	6.4E-01
		HS-CC2	4.27E+01	4.85E-02	4.48E-04	4.27E+01	6.65E+01	6.4E-01
		LP-PD	5.09E+01	8.05E-02	2.84E-04	5.10E+01	6.65E+01	7.7E-01
		LS	3.71E+01	6.44E-02	3.43E-04	3.72E+01	6.65E+01	5.6E-01
		LSm	1.09E+02	8.61E-02	6.93E-04	1.09E+02	6.65E+01	1.6E+00
		LSS	1.62E+02	1.90E-01	1.44E-03	1.62E+02	6.65E+01	2.4E+00

Notes:

N/C - Exposure not calculated for a receptor if data for the primary food type was not available at the sampling location.

ECOPC - Ecological Chemical of Potential Concern

mg/kg BW/day - milligram per kilogram of body weight per day

LOAEL - Lowest Observed Adverse Effects Level

TRV - Toxicity Reference Value

HQ - Hazard Quotient

TABLE 4-23
Comparison of Tier 2 Soil EPCs to Plant and Invertebrate Benchmarks By Panel

Analyte	Location	Soil EPC (mg/kg)	Plant Screening Benchmark (mg/kg)	Invertebrate Screening Benchmark (mg/kg)
Antimony	A Panel Area 1	0.705	5	78
	A Panel Area 2	3.3	5	78
	D Panel North	1.754	5	78
	D Panel South	2.678	5	78
	E Panel Area 1	0.503	5	78
	E Panel Area 2	0.0943	5	78
	North Sage Valley	0.136	5	78
	Pole Canyon ODA	2.612	5	78
Arsenic	A Panel Area 1	7.78	18	60
	A Panel Area 2	**27.52**	18	60
	D Panel North	14.41	18	60
	D Panel South	14.99	18	60
	E Panel Area 1	7.99	18	60
	E Panel Area 2	4.536	18	60
	North Sage Valley	5.013	18	60
	Pole Canyon ODA	**18.84**	18	60
Barium	A Panel Area 1	151.1	500	330
	A Panel Area 2	110.1	500	330
	D Panel North	102.7	500	330
	D Panel South	133.8	500	330
	E Panel Area 1	154.2	500	330
	E Panel Area 2	223.7	500	330
	North Sage Valley	220	500	330
	Pole Canyon ODA	111.4	500	330
Boron	A Panel Area 1	**27.31**	0.5	N/A
	A Panel Area 2	**51.56**	0.5	N/A
	D Panel North	**36.15**	0.5	N/A
	D Panel South	**34.13**	0.5	N/A
	E Panel Area 1	**32.04**	0.5	N/A
	E Panel Area 2	**22.74**	0.5	N/A
	North Sage	**17.34**	0.5	N/A
	Pole Canyon ODA	**42.73**	0.5	N/A
Cadmium	A Panel Area 1	14.29	32	140
	A Panel Area 2	**39.52**	32	140
	D Panel North	26.12	32	140
	D Panel South	**35.12**	32	140
	E Panel Area 1	13.11	32	140
	E Panel Area 2	6.371	32	140
	North Sage Valley	4.455	32	140
	Pole Canyon ODA	**33.29**	32	140

TABLE 4-23
Comparison of Tier 2 Soil EPCs to Plant and Invertebrate Benchmarks By Panel

Analyte	Location	Soil EPC (mg/kg)	Plant Screening Benchmark (mg/kg)	Invertebrate Screening Benchmark (mg/kg)
Chromium	A Panel Area 1	**152.8**	1	0.4
	A Panel Area 2	**504.2**	1	0.4
	D Panel North	**371.1**	1	0.4
	D Panel South	**428**	1	0.4
	E Panel Area 1	**210.6**	1	0.4
	E Panel Area 2	**45.84**	1	0.4
	North Sage Valley	**43.5**	1	0.4
	Pole Canyon ODA	**489**	1	0.4
Cobalt	A Panel Area 1	8.188	13	N/A
	A Panel Area 2	7.014	13	N/A
	D Panel North	6.111	13	N/A
	D Panel South	7.437	13	N/A
	E Panel Area 1	9.215	13	N/A
	E Panel Area 2	11.93	13	N/A
	North Sage Valley	9.775	13	N/A
	Pole Canyon ODA	6.78	13	N/A
Copper	A Panel Area 1	38.37	70	80
	A Panel Area 2	**84.92**	70	80
	D Panel North	55.34	70	80
	D Panel South	**70.27**	70	80
	E Panel Area 1	39.95	70	80
	E Panel Area 2	26.59	70	80
	North Sage Valley	28.58	70	80
	Pole Canyon ODA	**71.47**	70	80
Lead	A Panel Area 1	13.07	120	1700
	A Panel Area 2	11.87	120	1700
	D Panel North	9.956	120	1700
	D Panel South	11.51	120	1700
	E Panel Area 1	14.24	120	1700
	E Panel Area 2	16.32	120	1700
	North Sage Valley	17	120	1700
	Pole Canyon ODA	11.65	120	1700
Manganese	A Panel Area 1	**1893**	220	450
	A Panel Area 2	**2102**	220	450
	D Panel North	**1617**	220	450
	D Panel South	**1581**	220	450
	E Panel Area 1	**2823**	220	450
	E Panel Area 2	**3353**	220	450
	North Sage Valley	**1537**	220	450
	Pole Canyon ODA	**1992**	220	450

TABLE 4-23
Comparison of Tier 2 Soil EPCs to Plant and Invertebrate Benchmarks By Panel

Analyte	Location	Soil EPC (mg/kg)	Plant Screening Benchmark (mg/kg)	Invertebrate Screening Benchmark (mg/kg)
Mercury	A Panel Area 1	**0.116**	0.3	0.1
	A Panel Area 2	**0.367**	0.3	0.1
	D Panel North	**0.199**	0.3	0.1
	D Panel South	**0.239**	0.3	0.1
	E Panel Area 1	**0.167**	0.3	0.1
	E Panel Area 2	0.038	0.3	0.1
	North Sage Valley	0.0435	0.3	0.1
	Pole Canyon ODA	**0.283**	0.3	0.1
Molybdenum	A Panel Area 1	**4.368**	2	N/A
	A Panel Area 2	**20.16**	2	N/A
	D Panel North	**11.88**	2	N/A
	D Panel South	**13.73**	2	N/A
	E Panel Area 1	**8.668**	2	N/A
	E Panel Area 2	1.702	2	N/A
	North Sage Valley	1.112	2	N/A
	Pole Canyon ODA	**16.56**	2	N/A
Nickel	A Panel Area 1	**69.93**	38	280
	A Panel Area 2	**201.6**	38	280
	D Panel North	**131.3**	38	280
	D Panel South	**141.9**	38	280
	E Panel Area 1	**83.77**	38	280
	E Panel Area 2	**38.99**	38	280
	North Sage Valley	25.78	38	280
	Pole Canyon ODA	**182.6**	38	280
Selenium	A Panel Area 1	**3.3**	0.52	4.1
	A Panel Area 2	**121**	0.52	4.1
	D Panel North	**27.1**	0.52	4.1
	D Panel South	**18.95**	0.52	4.1
	E Panel Area 1	**3.052**	0.52	4.1
	E Panel Area 2	0.499	0.52	4.1
	North Sage Valley	**0.624**	0.52	4.1
	Pole Canyon ODA	**24.28**	0.52	4.1
Thallium	A Panel Area 1	0.633	1	N/A
	A Panel Area 2	**1.125**	1	N/A
	D Panel North	0.795	1	N/A
	D Panel South	0.962	1	N/A
	E Panel Area 1	0.489	1	N/A
	E Panel Area 2	0.282	1	N/A
	North Sage Valley	0.32	1	N/A
	Pole Canyon ODA	1.031	1	N/A

TABLE 4-23
Comparison of Tier 2 Soil EPCs to Plant and Invertebrate Benchmarks By Panel

Analyte	Location	Soil EPC (mg/kg)	Plant Screening Benchmark (mg/kg)	Invertebrate Screening Benchmark (mg/kg)
Uranium	A Panel Area 1	12.51	250	100
	A Panel Area 2	36.78	250	100
	D Panel North	40.44	250	100
	D Panel South	27.89	250	100
	E Panel Area 1	12.97	250	100
	E Panel Area 2	4.075	250	100
	North Sage Valley	2.291	250	100
	Pole Canyon ODA	30.16	250	100
Vanadium	A Panel Area 1	**167.5**	2	N/A
	A Panel Area 2	**289.1**	2	N/A
	D Panel North	**232.7**	2	N/A
	D Panel South	**291.7**	2	N/A
	E Panel Area 1	**106**	2	N/A
	E Panel Area 2	**40.68**	2	N/A
	North Sage Valley	**45.44**	2	N/A
	Pole Canyon ODA	**241**	2	N/A
Zinc	A Panel Area 1	**316.9**	160	120
	A Panel Area 2	**822.6**	160	120
	D Panel North	**603.6**	160	120
	D Panel South	**654.3**	160	120
	E Panel Area 1	**345**	160	120
	E Panel Area 2	**123.2**	160	120
	North Sage Valley	**168.6**	160	120
	Pole Canyon ODA	**861**	160	120

Notes:

Bold = Exceeds one or more benchmark

N/A - No benchmark was available.

EPC - Exposure Point Concentration

mg/kg - milligram per kilogram

ODA - Overburden Disposal Area

TABLE 4-24
Comparison of Tier 2 Soil EPCs to Plant and Invertebrate Benchmarks By Reclamation Type

Analyte	Reclamation Type	Soil EPC (mg/kg)	Plant (mg/kg)	Invertebrate (mg/kg)
Antimony	Dinwoody	0.0956	5	78
	No Cover	3.222	5	78
	Topsoil Over Chert	1.757	5	78
	Topsoil Only	2.808	5	78
Arsenic	Dinwoody	4.536	18	60
	No Cover	20.2	18	60
	Topsoil Over Chert	9.856	18	60
	Topsoil Only	**19.04**	18	60
Barium	Dinwoody	223.7	500	330
	No Cover	92.26	500	330
	Topsoil Over Chert	137.1	500	330
	Topsoil Only	110	500	330
Boron	Dinwoody	**22.74**	0.5	N/A
	No Cover	**42.05**	0.5	N/A
	Topsoil Over Chert	**28.06**	0.5	N/A
	Topsoil Only	**42.28**	0.5	N/A
Cadmium	Dinwoody	6.371	32	140
	No Cover	**39.08**	32	140
	Topsoil Over Chert	20.36	32	140
	Topsoil Only	27.8	32	140
Chromium	Dinwoody	**45.84**	1	0.4
	No Cover	**513.6**	1	0.4
	Topsoil Over Chert	**248.5**	1	0.4
	Topsoil Only	**402.7**	1	0.4
Cobalt	Dinwoody	11.93	13	N/A
	No Cover	6.245	13	N/A
	Topsoil Over Chert	7.741	13	N/A
	Topsoil Only	6.376	13	N/A
Copper	Dinwoody	26.59	70	80
	No Cover	**83.59**	70	80
	Topsoil Over Chert	45.44	70	80
	Topsoil Only	62.49	70	80
Lead	Dinwoody	16.32	120	1700
	No Cover	10.9	120	1700
	Topsoil Over Chert	12.29	120	1700
	Topsoil Only	10.79	120	1700
Manganese	Dinwoody	**3353**	220	450
	No Cover	**1677**	220	450
	Topsoil Over Chert	**1607**	220	450
	Topsoil Only	**1596**	220	450

TABLE 4-24
Comparison of Tier 2 Soil EPCs to Plant and Invertebrate Benchmarks By Reclamation Type

Analyte	Reclamation Type	Soil EPC (mg/kg)	Plant (mg/kg)	Invertebrate (mg/kg)
Mercury	Dinwoody	0.038	0.3	0.1
	No Cover	**0.36**	0.3	0.1
	Topsoil Over Chert	0.147	0.3	0.1
	Topsoil Only	0.241	0.3	0.1
Molybdenum	Dinwoody	1.702	2	N/A
	No Cover	**19.85**	2	N/A
	Topsoil Over Chert	**8.492**	2	N/A
	Topsoil Only	**13.88**	2	N/A
Nickel	Dinwoody	**38.99**	38	280
	No Cover	**200.4**	38	280
	Topsoil Over Chert	**92.57**	38	280
	Topsoil Only	**151.9**	38	280
Selenium	Dinwoody	0.499	0.52	4.1
	No Cover	**25.65**	0.52	4.1
	Topsoil Over Chert	**7.998**	0.52	4.1
	Topsoil Only	**74.07**	0.52	4.1
Thallium	Dinwoody	0.282	1	N/A
	No Cover	**1.226**	1	N/A
	Topsoil Over Chert	0.649	1	N/A
	Topsoil Only	0.822	1	N/A
Uranium	Dinwoody	4.075	250	100
	No Cover	48.15	250	100
	Topsoil Over Chert	17.32	250	100
	Topsoil Only	28	250	100
Vanadium	Dinwoody	**40.68**	2	N/A
	No Cover	**394.9**	2	N/A
	Topsoil Over Chert	**179.1**	2	N/A
	Topsoil Only	**200.9**	2	N/A
Zinc	Dinwoody	**123.2**	160	120
	No Cover	**913.2**	160	120
	Topsoil Over Chert	**417.9**	160	120
	Topsoil Only	**654.2**	160	120

Notes:

Bold = Exceeds one or more benchmark

N/A - No benchmark was available.

EPC - Exposure Point Concentration

mg/kg - milligram per kilogram

TABLE 4-25
Tier 1 Risk Characterization Summary

	Antimony	Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead
Plants/Invertebrates	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	**Tier 3**	NOAEL HQ < 1	**Tier 3**	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
Upland Wildlife									
American Robin	Uncertain	N/A	N/A	N/A	NOAEL HQ < 1	NOAEL HQ < 1	N/A	NOAEL HQ < 1	N/A
Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**Tier 3**	**Tier 3**
Deer Mouse	NOAEL HQ < 1	NOAEL HQ < 1	N/A	N/A	NOAEL HQ < 1	N/A	N/A	NOAEL HQ < 1	N/A
Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Northern Bobwhite	Uncertain	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Northern Harrier	Uncertain	N/A	N/A	N/A	N/A	N/A	N/A	**Tier 3**	**Tier 3**

	Manganese	Mercury	Molybdenum	Nickel	Selenium	Thallium	Uranium	Vanadium	Zinc
Plants/Invertebrates	**Tier 3**	**Tier 3**	**Tier 3**	**Tier 3**	**Tier 3**	NOAEL HQ < 1	NOAEL HQ < 1	**Tier 3**	**Tier 3**
Upland Wildlife									
American Robin	N/A	N/A	N/A	N/A	**Tier 3**	N/A	N/A	**Tier 3**	N/A
Coyote	N/A	N/A	N/A	N/A	**Tier 3**	N/A	N/A	N/A	N/A
Deer Mouse	NOAEL HQ < 1	N/A	LOAEL HQ < 1	NOAEL HQ < 1	**Tier 3**	N/A	N/A	N/A	N/A
Eastern Cottontail	N/A	N/A	LOAEL HQ < 1	N/A	**Tier 3**	N/A	N/A	N/A	N/A
Mule Deer	N/A	N/A	LOAEL HQ < 1	N/A	**Tier 3**	N/A	N/A	N/A	N/A
Northern Bobwhite	N/A	N/A	N/A	N/A	**Tier 3**	N/A	N/A	LOAEL HQ < 1	N/A
Northern Harrier	N/A	N/A	N/A	N/A	**Tier 3**	N/A	N/A	NOAEL HQ < 1	**Tier 3**

Notes:

N/A - Not applicable. The RI COPC was not idenitified as an ECOPC for the receptor.

Tier 3 - The Tier 1 HQ calculated using the lowest LOAEL TRV was greater than 1.0 and potential risks are discussed in more detail in the Tier 3 Risk Characterization

NOAEL - No-Observed Adverse Effects Level

LOAEL - Lowest Observed Advers Effects Level

HQ - Hazard Quotient

TABLE 4-26
Tier 2 Risk Characterization Summary for Upland Receptors

ECOPC	Receptor	Panel A Area 1	Panel A Area 2	Panel D North	Panel D South	Panel E Area 1	Panel E Area 2	Pole Canyon ODA	North Sage Valley	No Cover	Topsoil Only	Topsoil Over Chert	Dinwoody
Antimony	American Robin	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain
	Northern Harrier	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain
	Plants/Invertebrates	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
Arsenic	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Plants/Invertebrates	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1
Barium	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Plants/Invertebrates	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
Boron	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Plants/Invertebrates	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
Cadmium	American Robin	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	Tier 3	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Plants/Invertebrates	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1
Chromium	American Robin	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Plants/Invertebrates	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3

TABLE 4-26
Tier 2 Risk Characterization Summary for Upland Receptors

ECOPC	Receptor	Panel A Area 1	Panel A Area 2	Panel D North	Panel D South	Panel E Area 1	Panel E Area 2	Pole Canyon ODA	North Sage Valley	No Cover	Topsoil Only	Topsoil Over Chert	Dinwoody
Cobalt	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Plants/Invertebrates	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
Copper	American Robin	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Coyote	Tier 3	LOAEL HQ < 1	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
	Deer Mouse	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
	Plants/Invertebrates	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
Lead	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Deer Mouse	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	Tier 3	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	LOAEL HQ < 1	Tier 3	Tier 3	Tier 3	Tier 3
	Plants/Invertebrates	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
Manganese	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Plants/Invertebrates	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
Mercury	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Plants/Invertebrates	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
Molybdenum	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1
	Eastern Cottontail	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1
	Mule Deer	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Plants/Invertebrates	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1

TABLE 4-26
Tier 2 Risk Characterization Summary for Upland Receptors

ECOPC	Receptor	Panel A Area 1	Panel A Area 2	Panel D North	Panel D South	Panel E Area 1	Panel E Area 2	Pole Canyon ODA	North Sage Valley	No Cover	Topsoil Only	Topsoil Over Chert	Dinwoody
Nickel	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	NOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1	Tier 3	NOAEL HQ < 1
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Plants/Invertebrates	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	Tier 3
Selenium	American Robin	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
	Coyote	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1
	Deer Mouse	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
	Eastern Cottontail	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1
	Mule Deer	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1
	Northern Bobwhite	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1
	Northern Harrier	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1
	Plants/Invertebrates	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1
Thallium	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Plants/Invertebrates	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
Uranium	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Plants/Invertebrates	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
Vanadium	American Robin	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1
	Northern Harrier	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Plants/Invertebrates	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
Zinc	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	Tier 3	LOAEL HQ < 1	NOAEL HQ < 1
	Plants/Invertebrates	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1

Notes:

N/A - Not applicable. The RI COPC was not idenitified as an ECOPC for the receptor.

Tier 3 - The Tier 2 HQ calculated using the lowest LOAEL TRV was greater than 1.0 and potential risks are discussed in more detail in the Tier 3 Risk Characterization

ECOPC - Ecological Chemical of Potential Concern, HQ - Hazard Quotient, LOAEL - Lowest Observed Adverse Effects Level, NOAEL - No-Observed Adverse Effects Level, ODA - Overburden Disposal Area

TABLE 4-27
Tier 2 Riparian Risk Characterization Summary

ECOPC	Receptor	DS-7	ES-3	ES-4	HS-3	HS-CC1	HS-CC2	LP-PD	LS	LSm	LSS
Antimony	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Meadow Vole	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Mink	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Raccoon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arsenic	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Belted Kingfisher	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mallard	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Meadow Vole	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Mink	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Raccoon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Red-Winged Blackbird	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Song Sparrow	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cadmium	American Robin	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Belted Kingfisher	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	**Tier 3**	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mallard	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Meadow Vole	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Mink	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Raccoon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Red-Winged Blackbird	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Song Sparrow	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE 4-27
Tier 2 Riparian Risk Characterization Summary

ECOPC	Receptor	DS-7	ES-3	ES-4	HS-3	HS-CC1	HS-CC2	LP-PD	LS	LSm	LSS
Chromium	American Robin	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Belted Kingfisher	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mallard	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Meadow Vole	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mink	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Raccoon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Red-Winged Blackbird	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Song Sparrow	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
Copper	American Robin	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Belted Kingfisher	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	Tier 3	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	Tier 3
	Deer Mouse	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mallard	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Meadow Vole	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Mink	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	Tier 3	LOAEL HQ < 1	Tier 3
	Raccoon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Red-Winged Blackbird	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Song Sparrow	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Belted Kingfisher	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Deer Mouse	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mallard	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Meadow Vole	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mink	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	Tier 3
	Raccoon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Red-Winged Blackbird	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Song Sparrow	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE 4-27
Tier 2 Riparian Risk Characterization Summary

ECOPC	Receptor	DS-7	ES-3	ES-4	HS-3	HS-CC1	HS-CC2	LP-PD	LS	LSm	LSS
Manganese	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Belted Kingfisher	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mallard	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Meadow Vole	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1	Tier 3
	Mink	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Raccoon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Red-Winged Blackbird	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Song Sparrow	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Molybdenum	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Belted Kingfisher	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	LOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1
	Eastern Cottontail	LOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Mallard	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Meadow Vole	LOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1
	Mink	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Mule Deer	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Raccoon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Red-Winged Blackbird	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Song Sparrow	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
Nickel	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Belted Kingfisher	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mallard	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Meadow Vole	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Mink	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Raccoon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Red-Winged Blackbird	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Song Sparrow	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE 4-27
Tier 2 Riparian Risk Characterization Summary

ECOPC	Receptor	DS-7	ES-3	ES-4	HS-3	HS-CC1	HS-CC2	LP-PD	LS	LSm	LSS
Selenium	American Robin	Tier 3	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3
	Belted Kingfisher	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1	Tier 3
	Coyote	Tier 3	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Deer Mouse	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	LOAEL HQ < 1	Tier 3
	Eastern Cottontail	Tier 3	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Mallard	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	Tier 3
	Meadow Vole	Tier 3	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3
	Mink	Tier 3	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3
	Mule Deer	Tier 3	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Northern Bobwhite	Tier 3	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Northern Harrier	Tier 3	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1
	Raccoon	Tier 3	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3
	Red-Winged Blackbird	Tier 3	NOAEL HQ < 1	Tier 3	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1
	Song Sparrow	Tier 3	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
Vanadium	American Robin	Tier 3	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1
	Belted Kingfisher	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mallard	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	LOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	Tier 3	Tier 3	Tier 3
	Meadow Vole	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mink	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Northern Harrier	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Raccoon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Red-Winged Blackbird	Tier 3	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3
	Song Sparrow	Tier 3	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3
Zinc	American Robin	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Belted Kingfisher	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Coyote	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Deer Mouse	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Eastern Cottontail	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mallard	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Meadow Vole	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1
	Mink	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mule Deer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Bobwhite	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Northern Harrier	Tier 3	Tier 3	Tier 3	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	NOAEL HQ < 1	Tier 3	Tier 3
	Raccoon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Red-Winged Blackbird	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Song Sparrow	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

Tier 3 - The Tier 2 HQ calculated using the lowest LOAEL TRV was greater than 1.0 and potential risks are discussed in more detail in the Tier 3 Risk Characterization

N/A - Not applicable. The RI COPC was not idenitified as an ECOPC for the receptor.

ECOPC - Ecological Chemical of Potential Concern, HQ - Hazard Quotient, LOAEL - Lowest Observed Adverse Effects Level, NOAEL - No-Observed Adverse Effects Level

TABLE 4-28
Hazard Quotients Calculated Using Alternative TRV for Cadmium

Location	Receptor	ECOPC	Exposure Food (mg/kg BW/day	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg BW/day)	Exposure Total (mg/kg BW/day)	TRV Type	Toxicity Reference Value	Hazard Quotient
								Geomean NOAEL Growth and Reproduction (mg/kg BW/day)	
By Reclamation Type									
Topsoil Only	Deer Mouse	Cadmium	9.98E-01	8.90E-02	0.00E+00	1.09E+00	NOAEL	1.86	5.8E-01
Topsoil Chert			6.72E-01	6.52E-02	0.00E+00	7.37E-01	NOAEL	1.86	4.0E-01
No Cover			9.99E-01	1.25E-01	0.00E+00	1.12E+00	NOAEL	1.86	6.0E-01
Dinwoody			2.32E-01	2.04E-02	0.00E+00	2.52E-01	NOAEL	1.86	1.4E-01
By Mine Panel									
A Panel Area 1	Deer Mouse	Cadmium	7.22E-01	4.57E-02	8.95E-04	7.68E-01	NOAEL	1.86	4.1E-01
A Panel Area 2			1.27E+00	1.26E-01	8.95E-04	1.39E+00	NOAEL	1.86	7.5E-01
D Panel North			1.02E+00	8.36E-02	2.88E-03	1.10E+00	NOAEL	1.86	5.9E-01
D Panel South			6.45E-01	1.12E-01	2.88E-03	7.61E-01	NOAEL	1.86	4.1E-01
E Panel Area 1			1.74E+00	4.20E-02	5.40E-04	1.79E+00	NOAEL	1.86	9.6E-01
E Panel Area 2			2.32E-01	2.04E-02	5.40E-04	2.53E-01	NOAEL	1.86	1.4E-01
North Sage			3.28E-01	1.43E-02	7.97E-05	3.42E-01	NOAEL	1.86	1.8E-01
Pole Canyon			1.02E+00	1.07E-01	4.76E-03	1.14E+00	NOAEL	1.86	6.1E-01
By Riparian Location									
DS-7	Deer Mouse	Cadmium	1.24E+00	1.36E-01	2.07E-03	1.38E+00	NOAEL	1.86	7.4E-01
ES-3			5.05E-01	1.89E-02	4.75E-04	5.24E-01	NOAEL	1.86	2.8E-01
ES-4			2.64E-01	1.63E-02	4.75E-04	2.80E-01	NOAEL	1.86	1.5E-01
HS-3			1.95E-01	5.12E-03	5.26E-06	2.00E-01	NOAEL	1.86	1.1E-01
HS-CC1			3.67E-01	5.76E-03	5.26E-06	3.73E-01	NOAEL	1.86	2.0E-01
HS-CC2			3.86E-01	8.32E-03	5.26E-06	3.94E-01	NOAEL	1.86	2.1E-01
LP-PD			3.86E-01	8.96E-03	5.26E-06	3.95E-01	NOAEL	1.86	2.1E-01
LS			4.45E-01	6.72E-03	7.30E-06	4.52E-01	NOAEL	1.86	2.4E-01
LSm			5.39E-01	1.28E-02	2.41E-05	5.52E-01	NOAEL	1.86	3.0E-01
LSS			6.25E-01	5.98E-02	4.88E-05	6.85E-01	NOAEL	1.86	3.7E-01

Notes:

ECOPC - Ecological Chemical of Potential Concern
LOAEL - Lowest Observed Adverse Effect Level
NOAEL - No-Observed Adverse Effect Level
mg/kg BW/day - milligram per kilogram of body weight per day
TRV - Toxicity Reference Value

TABLE 4-29
Hazard Quotients Calculated Using Alternative TRV for Chromium

Location	Receptor	ECOPC	Exposure Food (mg/kg BW/day)	Exposure Soil/Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg BW/day)	Exposure Total (mg/kg BW/day)	LOAEL TRV (mg/kg BW/day)	HQ
DS-7	Song Sparrow	Chromium	1.92E-01	3.17E+00	1.34E-03	3.37E+00	5	6.7E-01
ES-3			3.12E-01	2.70E-01	8.57E-03	5.91E-01	5	1.2E-01
ES-4			7.20E-02	2.43E-01	8.57E-03	3.23E-01	5	6.5E-02
HS-3			9.60E-02	7.39E-02	1.60E-04	1.70E-01	5	3.4E-02
HS-CC1			7.20E-02	1.84E-01	1.50E-04	2.56E-01	5	5.1E-02
HS-CC2			4.80E-02	1.77E-01	1.50E-04	2.25E-01	5	4.5E-02
LP-PD			1.92E-01	1.48E-01	1.03E-04	3.40E-01	5	6.8E-02
LS			1.68E-01	1.55E-01	2.79E-04	3.23E-01	5	6.5E-02
LSm			1.44E-01	2.10E-01	5.95E-04	3.54E-01	5	7.1E-02
LSS			7.20E-02	3.56E-01	1.20E-03	4.29E-01	5	8.6E-02

Notes:
ECOPC - Ecological Chemical of Potential Concern
HQ - Hazard Quotient
LOAEL - Lowest Observed Adverse Effect Level
mg/kg BW/day - milligram per kilogram of body weight per day
TRV - Toxicity Reference Value

TABLE 4-30
Hazard Quotients Calculated Using Alternative TRVs for Lead

Location	Receptor	Exposure Food (mg/kg BW/day	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg Bw/day)	Exposure Total (mg/kg BW/day)	Toxicity Reference Value Geometric Mean NOAEL for Growth and Reproduction (mg/kg BW/day)	Hazard Quotient
Riparian Location							
DS-7	Coyote	2.33E-01	1.06E-02	2.41E-05	2.43E-01	40.73	2.4E+01
ES-3		1.74E-01	1.11E-02	1.64E-04	1.85E-01	40.73	3.7E+01
ES-4		2.76E-01	8.37E-03	1.64E-04	2.84E-01	40.73	3.8E+01
HS-3		7.98E-01	8.91E-03	3.35E-06	8.06E-01	40.73	3.9E+01
HS-CC1		2.22E-01	1.43E-02	2.03E-06	2.36E-01	40.73	4.0E+01
HS-CC2		2.22E-01	1.02E-02	2.03E-06	2.32E-01	40.73	4.1E+01
LP-PD		5.45E-02	1.07E-02	1.65E-05	6.52E-02	40.73	4.2E+01
LS		3.42E+00	9.54E-03	2.68E-05	3.43E+00	40.73	4.3E+01
LSm		5.09E-02	1.13E-02	3.39E-05	6.23E-02	40.73	4.4E+01
LSS		6.51E-01	1.95E-02	1.07E-04	6.70E-01	40.73	4.5E+01
LS	Northern Harrier	1.12E+01	7.42E-03	2.55E-05	1.12E+01	10.94	1.2E+02
DS-7		7.63E-01	8.26E-03	2.29E-05	7.71E-01	10.94	1.4E+02
ES-3		5.66E-01	8.61E-03	1.55E-04	5.75E-01	10.94	1.6E+02
ES-4		9.04E-01	6.51E-03	1.55E-04	9.11E-01	10.94	1.6E+02
HS-3		2.61E+00	6.93E-03	3.18E-06	2.62E+00	10.94	1.6E+02
HS-CC1		7.27E-01	1.11E-02	1.92E-06	7.38E-01	10.94	1.6E+02
HS-CC2		7.27E-01	7.91E-03	1.92E-06	7.35E-01	10.94	1.6E+02
LP-PD		1.78E-01	8.33E-03	1.57E-05	1.86E-01	10.94	1.6E+02
LSm		1.66E-01	8.82E-03	3.21E-05	1.75E-01	10.94	1.6E+02
LSS		2.14E+00	1.52E-02	1.01E-04	2.15E+00	10.94	1.6E+02
By Reclamation Type							
No Cover	Coyote	1.56E+01	9.81E-03	N/A	1.56E+01	40.73	3.8E-01
Topsoil Chert		2.48E+00	1.11E-02	N/A	2.49E+00	40.73	6.1E-02
Dinwoody		1.51E+00	1.47E-02	N/A	1.53E+00	40.73	3.8E-02
Topsoil Only		1.10E+00	9.71E-03	N/A	1.11E+00	40.73	2.7E-02
No Cover	Northern Harrier	5.12E+01	7.63E-03	N/A	5.12E+01	10.94	4.7E+00
Topsoil Chert		8.13E+00	8.60E-03	N/A	8.13E+00	10.94	7.4E-01
Dinwoody		4.97E+00	1.14E-02	N/A	4.98E+00	10.94	4.5E-01
Topsoil Only		3.60E+00	7.55E-03	N/A	3.61E+00	10.94	3.3E-01

TABLE 4-30
Hazard Quotients Calculated Using Alternative TRVs for Lead

Location	Receptor	Exposure Food (mg/kg BW/day	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg Bw/day)	Exposure Total (mg/kg BW/day)	Toxicity Reference Value Geometric Mean NOAEL for Growth and Reproduction (mg/kg BW/day)	Hazard Quotient
By Mine Panel							
A Panel Area 1	Coyote	6.84E+00	1.18E-02	5.54E-04	6.85E+00	40.73	1.7E-01
A Panel Area 2		3.40E-01	1.07E-02	5.54E-04	3.51E-01	40.73	8.6E-03
D Panel North		6.26E-01	8.96E-03	5.54E-04	6.36E-01	40.73	1.6E-02
D Panel South		1.64E+00	1.04E-02	5.54E-04	1.66E+00	40.73	4.1E-02
E Panel Area 1		4.54E+00	1.28E-02	5.54E-04	4.56E+00	40.73	1.1E-01
E Panel Area 2		1.51E+00	1.47E-02	5.54E-04	1.53E+00	40.73	3.8E-02
North Sage Valley		5.76E-01	1.53E-02	5.54E-04	5.92E-01	40.73	1.5E-02
Pole Canyon ODA		6.88E+00	1.05E-02	5.54E-04	6.89E+00	40.73	1.7E-01
Site-wide		1.94E+00	1.12E-02	6.79E-05	1.95E+00	40.73	4.8E-02
A Panel Area 1	Northern Harrier	2.25E+01	9.15E-03	5.25E-04	2.25E+01	10.94	2.1E+00
E Panel Area 1		1.49E+01	9.97E-03	5.25E-04	1.49E+01	10.94	1.4E+00
Pole Canyon ODA		2.26E+01	8.16E-03	5.25E-04	2.26E+01	10.94	2.1E+00
A Panel Area 2		1.11E+00	8.31E-03	5.25E-04	1.12E+00	10.94	1.0E-01
D Panel North		2.05E+00	6.97E-03	5.25E-04	2.06E+00	10.94	1.9E-01
D Panel South		5.40E+00	8.06E-03	5.25E-04	5.40E+00	10.94	4.9E-01
E Panel Area 2		4.97E+00	1.14E-02	5.25E-04	4.98E+00	10.94	4.6E-01
North Sage Valley		1.89E+00	1.19E-02	5.25E-04	1.90E+00	10.94	1.7E-01
Site-wide		6.37E+00	8.72E-03	6.45E-05	6.38E+00	10.94	5.8E-01

Notes:

LOAEL - Lowest Observed Adverse Effect Level

mg/kg BW/day - milligram per kilogram of body weight per day

TRV - Toxicity Reference Value

ODA - Overburden Disposal Area

TABLE 4-31
Comparison of Selenium Concentrations in Exposure Media

Panel	Location	Soil (mg/kg)	Vegetation (mg/kg)	Invertebrate (mg/kg)	Small Mammals (mg/kg)
High Exposure Panels	Pole Canyon ODA	24.28	14.41	28.79	56.05
	Panel D North	27.1	29.12	51.36	49.11
	Panel D South	18.95	20.55	38.89	37.63
	Panel A Area 2	121	39.39	22.91	20.95
Low Exposure Panels	Panel A Area 1	3.3	0.83	3.183	14.13
	Panel E Area 1	3.052	1.906	4.377	3.71
	North Sage Valley	0.624	1.399	8.829	2.686
	Panel E Area 2	0.499	0.208	6.446	2.39

Notes:
ODA - Overburden Disposal Area
mg/kg - milligram per kilogram

TABLE 4-32
Hazard Quotients Calculated for Selenium Using Alternative TRVs at Seep and Riparian Sampling Locations

Location	Receptor	Exposure Food (mg/kg BW/day	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg BW/day)	Exposure Total (mg/kg BW/day)	Toxicity Reference Value Geometric Mean NOAEL (mg/kg BW/day)	Hazard Quotient
DS-7	American Robin	1.27E+01	2.36E-01	4.48E-01	1.34E+01	6.10E-01	2.2E+01
	Belted Kingfisher	NC	NC	3.57E-01	3.57E-01	6.10E-01	5.8E-01
	Coyote	1.09E+00	7.88E-02	2.53E-01	1.42E+00	4.37E-01	3.2E+00
	Deer Mouse	1.22E+01	2.80E-01	4.73E-01	1.29E+01	4.37E-01	3.0E+01
	Eastern Cottontail	2.11E+00	1.31E-01	3.15E-01	2.56E+00	4.37E-01	5.8E+00
	Mallard	NC	NC	1.85E-01	1.85E-01	6.10E-01	3.0E-01
	Meadow Vole	1.10E+01	4.73E-01	4.48E-01	1.20E+01	4.37E-01	2.7E+01
	Mink	7.37E-02	4.11E-01	3.24E-01	8.09E-01	4.37E-01	1.9E+00
	Mule Deer	1.38E+00	2.63E-02	2.14E-01	1.62E+00	4.37E-01	3.7E+00
	Northern Bobwhite	3.99E+00	1.66E-01	3.31E-01	4.49E+00	6.10E-01	7.4E+00
	Northern Harrier	3.07E+00	6.13E-02	2.40E-01	3.37E+00	6.10E-01	5.5E+00
	Raccoon	3.00E-01	2.10E-01	2.66E-01	7.76E-01	4.37E-01	1.8E+00
	Red-Winged Blackbird	7.31E+00	2.80E-01	5.42E-01	8.13E+00	6.10E-01	1.3E+01
	Song Sparrow	8.30E+00	4.20E-01	6.65E-01	9.39E+00	6.10E-01	1.5E+01
ES-3	American Robin	2.11E-01	3.24E-03	7.96E-04	2.15E-01	6.10E-01	3.5E-01
	Belted Kingfisher	NC	NC	6.35E-04	6.35E-04	6.10E-01	1.0E-03
	Coyote	5.90E-02	1.08E-03	4.50E-04	6.05E-02	4.37E-01	1.4E-01
	Deer Mouse	1.95E-01	3.84E-03	8.42E-04	2.00E-01	4.37E-01	4.6E-01
	Eastern Cottontail	1.04E-02	1.80E-03	5.60E-04	1.27E-02	4.37E-01	2.9E-02
	Mallard	NC	NC	3.29E-04	3.29E-04	6.10E-01	5.4E-04
	Meadow Vole	6.31E-02	6.48E-03	7.96E-04	7.03E-02	4.37E-01	1.6E-01
	Mink	7.64E-04	5.64E-03	5.77E-04	6.98E-03	4.37E-01	1.6E-02
	Mule Deer	6.80E-03	3.60E-04	3.81E-04	7.54E-03	4.37E-01	1.7E-02
	Northern Bobwhite	3.90E-02	2.28E-03	5.89E-04	4.19E-02	6.10E-01	6.9E-02
	Northern Harrier	1.85E-01	8.40E-04	4.27E-04	1.87E-01	6.10E-01	3.1E-01
	Raccoon	5.37E-03	2.88E-03	4.73E-04	8.72E-03	4.37E-01	2.0E-02
	Red-Winged Blackbird	8.46E-02	3.84E-03	9.64E-04	8.95E-02	6.10E-01	1.5E-01
	Song Sparrow	4.08E-02	5.76E-03	1.18E-03	4.77E-02	6.10E-01	7.8E-02
ES-4	American Robin	3.59E+01	2.66E-01	7.96E-04	3.62E+01	6.10E-01	5.9E+01
	Belted Kingfisher	NC	NC	6.35E-04	6.35E-04	6.10E-01	1.0E-03
	Coyote	3.42E+00	8.88E-02	4.50E-04	3.50E+00	4.37E-01	8.0E+00
	Deer Mouse	3.55E+01	3.16E-01	8.42E-04	3.58E+01	4.37E-01	8.2E+01
	Eastern Cottontail	9.09E+00	1.48E-01	5.60E-04	9.24E+00	4.37E-01	2.1E+01
	Mallard	NC	NC	3.29E-04	3.29E-04	6.10E-01	5.4E-04
	Meadow Vole	4.65E+01	5.33E-01	7.96E-04	4.70E+01	4.37E-01	1.1E+02
	Mink	3.10E-01	4.64E-01	5.77E-04	7.74E-01	4.37E-01	1.8E+00
	Mule Deer	5.96E+00	2.96E-02	3.81E-04	5.99E+00	4.37E-01	1.4E+01
	Northern Bobwhite	1.48E+01	1.88E-01	5.89E-04	1.49E+01	6.10E-01	2.5E+01
	Northern Harrier	9.79E+00	6.91E-02	4.27E-04	9.86E+00	6.10E-01	1.6E+01
	Raccoon	1.22E+00	2.37E-01	4.73E-04	1.46E+00	4.37E-01	3.3E+00
	Red-Winged Blackbird	2.54E+01	3.16E-01	9.64E-04	2.57E+01	6.10E-01	4.2E+01
	Song Sparrow	3.58E+01	4.74E-01	1.18E-03	3.62E+01	6.10E-01	5.9E+01
HS-3	American Robin	7.38E-01	1.27E-02	1.01E-02	7.61E-01	6.10E-01	1.2E+00
	Belted Kingfisher	1.29E+00	1.16E-02	8.02E-03	1.31E+00	6.10E-01	2.1E+00
	Coyote	3.17E-01	4.23E-03	5.69E-03	3.27E-01	4.37E-01	7.5E-01
	Deer Mouse	6.77E-01	1.50E-02	1.06E-02	7.03E-01	4.37E-01	1.6E+00
	Eastern Cottontail	1.71E-02	7.05E-03	7.07E-03	3.12E-02	4.37E-01	7.1E-02
	Mallard	1.74E+00	2.42E-02	4.16E-03	1.77E+00	6.10E-01	2.9E+00
	Meadow Vole	1.27E-01	2.54E-02	1.01E-02	1.62E-01	4.37E-01	3.7E-01
	Mink	9.37E-01	4.68E-02	7.29E-03	9.91E-01	4.37E-01	2.3E+00
	Mule Deer	1.12E-02	1.41E-03	4.81E-03	1.74E-02	4.37E-01	4.0E-02
	Northern Bobwhite	1.15E-01	8.93E-03	7.44E-03	1.31E-01	6.10E-01	2.2E-01
	Northern Harrier	1.01E+00	3.29E-03	5.39E-03	1.02E+00	6.10E-01	1.7E+00
	Raccoon	4.21E-01	2.39E-02	5.98E-03	4.50E-01	4.37E-01	1.0E+00
	Red-Winged Blackbird	2.67E-01	1.50E-02	1.22E-02	2.95E-01	6.10E-01	4.8E-01
	Song Sparrow	6.72E-02	2.26E-02	1.49E-02	1.05E-01	6.10E-01	1.7E-01

TABLE 4-32
Hazard Quotients Calculated for Selenium Using Alternative TRVs at Seep and Riparian Sampling Locations

Location	Receptor	Exposure Food (mg/kg BW/day	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg BW/day)	Exposure Total (mg/kg BW/day)	Toxicity Reference Value Geometric Mean NOAEL (mg/kg BW/day)	Hazard Quotient
HS-CC1	American Robin	4.31E-01	2.27E-02	1.24E-02	4.66E-01	6.10E-01	7.6E-01
	Belted Kingfisher	1.29E+00	9.24E-03	9.87E-03	1.31E+00	6.10E-01	2.1E+00
	Coyote	1.44E-01	7.56E-03	7.00E-03	1.59E-01	4.37E-01	3.6E-01
	Deer Mouse	4.01E-01	2.69E-02	1.31E-02	4.41E-01	4.37E-01	1.0E+00
	Eastern Cottontail	3.05E-02	1.26E-02	8.70E-03	5.18E-02	4.37E-01	1.2E-01
	Mallard	1.74E+00	1.93E-02	5.11E-03	1.77E+00	6.10E-01	2.9E+00
	Meadow Vole	1.74E-01	4.54E-02	1.24E-02	2.32E-01	4.37E-01	5.3E-01
	Mink	9.37E-01	5.92E-02	8.97E-03	1.00E+00	4.37E-01	2.3E+00
	Mule Deer	2.00E-02	2.52E-03	5.92E-03	2.84E-02	4.37E-01	6.5E-02
	Northern Bobwhite	8.99E-02	1.60E-02	9.15E-03	1.15E-01	6.10E-01	1.9E-01
	Northern Harrier	4.58E-01	5.88E-03	6.64E-03	4.70E-01	6.10E-01	7.7E-01
	Raccoon	4.09E-01	3.02E-02	7.36E-03	4.47E-01	4.37E-01	1.0E+00
	Red-Winged Blackbird	1.87E-01	2.69E-02	1.50E-02	2.28E-01	6.10E-01	3.7E-01
	Song Sparrow	1.20E-01	4.03E-02	1.84E-02	1.79E-01	6.10E-01	2.9E-01
HS-CC2	American Robin	6.98E-01	4.32E-03	1.24E-02	7.15E-01	6.10E-01	1.2E+00
	Belted Kingfisher	1.29E+00	1.76E-03	9.87E-03	1.30E+00	6.10E-01	2.1E+00
	Coyote	1.50E-01	1.44E-03	7.00E-03	1.58E-01	4.37E-01	3.6E-01
	Deer Mouse	6.42E-01	5.12E-03	1.31E-02	6.60E-01	4.37E-01	1.5E+00
	Eastern Cottontail	2.14E-02	2.40E-03	8.70E-03	3.25E-02	4.37E-01	7.4E-02
	Mallard	1.56E+00	3.68E-03	5.11E-03	1.56E+00	6.10E-01	2.6E+00
	Meadow Vole	1.45E-01	8.64E-03	1.24E-02	1.66E-01	4.37E-01	3.8E-01
	Mink	9.15E-01	1.13E-02	8.97E-03	9.35E-01	4.37E-01	2.1E+00
	Mule Deer	1.40E-02	4.80E-04	5.92E-03	2.04E-02	4.37E-01	4.7E-02
	Northern Bobwhite	1.15E-01	3.04E-03	9.15E-03	1.27E-01	6.10E-01	2.1E-01
	Northern Harrier	4.64E-01	1.12E-03	6.64E-03	4.72E-01	6.10E-01	7.7E-01
	Raccoon	3.35E-01	5.76E-03	7.36E-03	3.48E-01	4.37E-01	8.0E-01
	Red-Winged Blackbird	2.61E-01	5.12E-03	1.50E-02	2.81E-01	6.10E-01	4.6E-01
	Song Sparrow	8.40E-02	7.68E-03	1.84E-02	1.10E-01	6.10E-01	1.8E-01
LP-PD	American Robin	5.44E+00	1.51E-03	4.83E-05	5.45E+00	6.10E-01	8.9E+00
	Belted Kingfisher	NC	1.47E-02	3.85E-05	1.48E-02	6.10E-01	2.4E-02
	Coyote	4.58E-01	5.04E-04	2.73E-05	4.59E-01	4.37E-01	1.0E+00
	Deer Mouse	5.75E+00	1.79E-03	5.11E-05	5.75E+00	4.37E-01	1.3E+01
	Eastern Cottontail	2.56E+00	8.40E-04	3.40E-05	2.56E+00	4.37E-01	5.9E+00
	Mallard	1.18E+00	3.08E-02	2.00E-05	1.21E+00	6.10E-01	2.0E+00
	Meadow Vole	1.28E+01	3.02E-03	4.83E-05	1.28E+01	4.37E-01	2.9E+01
	Mink	1.71E-01	3.41E-02	3.50E-05	2.05E-01	4.37E-01	4.7E-01
	Mule Deer	1.68E+00	1.68E-04	2.31E-05	1.68E+00	4.37E-01	3.8E+00
	Northern Bobwhite	3.55E+00	1.06E-03	3.57E-05	3.55E+00	6.10E-01	5.8E+00
	Northern Harrier	1.28E+00	3.92E-04	2.59E-05	1.28E+00	6.10E-01	2.1E+00
	Raccoon	5.75E-01	1.74E-02	2.87E-05	5.93E-01	4.37E-01	1.4E+00
	Red-Winged Blackbird	5.61E+00	1.79E-03	5.85E-05	5.62E+00	6.10E-01	9.2E+00
	Song Sparrow	1.01E+01	2.69E-03	7.18E-05	1.01E+01	6.10E-01	1.7E+01
LS	American Robin	2.27E-01	1.49E-03	4.14E-05	2.28E-01	6.10E-01	3.7E-01
	Belted Kingfisher	2.73E-01	7.15E-04	3.30E-05	2.74E-01	6.10E-01	4.5E-01
	Coyote	5.57E-02	4.95E-04	2.34E-05	5.63E-02	4.37E-01	1.3E-01
	Deer Mouse	2.10E-01	1.76E-03	4.38E-05	2.12E-01	4.37E-01	4.8E-01
	Eastern Cottontail	1.10E-02	8.25E-04	2.91E-05	1.18E-02	4.37E-01	2.7E-02
	Mallard	5.59E-01	1.50E-03	1.71E-05	5.60E-01	6.10E-01	9.2E-01
	Meadow Vole	6.70E-02	2.97E-03	4.14E-05	7.00E-02	4.37E-01	1.6E-01
	Mink	2.12E-01	4.11E-03	3.00E-05	2.17E-01	4.37E-01	5.0E-01
	Mule Deer	7.20E-03	1.65E-04	1.98E-05	7.38E-03	4.37E-01	1.7E-02
	Northern Bobwhite	4.17E-02	1.05E-03	3.06E-05	4.28E-02	6.10E-01	7.0E-02
	Northern Harrier	1.74E-01	3.85E-04	2.22E-05	1.75E-01	6.10E-01	2.9E-01
	Raccoon	1.31E-01	2.10E-03	2.46E-05	1.33E-01	4.37E-01	3.0E-01
	Red-Winged Blackbird	9.07E-02	1.76E-03	5.01E-05	9.25E-02	6.10E-01	1.5E-01
	Song Sparrow	4.32E-02	2.64E-03	6.15E-05	4.59E-02	6.10E-01	7.5E-02

TABLE 4-32
Hazard Quotients Calculated for Selenium Using Alternative TRVs at Seep and Riparian Sampling Locations

Location	Receptor	Exposure Food (mg/kg BW/day	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg BW/day)	Exposure Total (mg/kg BW/day)	Toxicity Reference Value	Hazard Quotient
						Geometric Mean NOAEL (mg/kg BW/day)	
LSm	American Robin	1.54E-01	1.49E-03	1.20E-04	1.56E-01	6.10E-01	2.6E-01
	Belted Kingfisher	3.45E-01	6.82E-04	9.57E-05	3.46E-01	6.10E-01	5.7E-01
	Coyote	2.13E-02	4.95E-04	6.79E-05	2.18E-02	4.37E-01	5.0E-02
	Deer Mouse	1.42E-01	1.76E-03	1.27E-04	1.44E-01	4.37E-01	3.3E-01
	Eastern Cottontail	5.49E-03	8.25E-04	8.44E-05	6.40E-03	4.37E-01	1.5E-02
	Mallard	2.18E-01	1.43E-03	4.96E-05	2.19E-01	6.10E-01	3.6E-01
	Meadow Vole	3.59E-02	2.97E-03	1.20E-04	3.90E-02	4.37E-01	8.9E-02
	Mink	2.32E-01	4.04E-03	8.70E-05	2.36E-01	4.37E-01	5.4E-01
	Mule Deer	3.60E-03	1.65E-04	5.74E-05	3.82E-03	4.37E-01	8.7E-03
	Northern Bobwhite	2.62E-02	1.05E-03	8.87E-05	2.73E-02	6.10E-01	4.5E-02
	Northern Harrier	6.39E-02	3.85E-04	6.44E-05	6.43E-02	6.10E-01	1.1E-01
	Raccoon	5.27E-02	2.06E-03	7.13E-05	5.48E-02	4.37E-01	1.3E-01
	Red-Winged Blackbird	5.88E-02	1.76E-03	1.45E-04	6.07E-02	6.10E-01	9.9E-02
	Song Sparrow	2.16E-02	2.64E-03	1.78E-04	2.44E-02	6.10E-01	4.0E-02
LSS	American Robin	6.36E-01	2.81E-02	2.50E-03	6.67E-01	6.10E-01	1.1E+00
	Belted Kingfisher	9.44E-01	2.09E-03	1.99E-03	9.48E-01	6.10E-01	1.6E+00
	Coyote	1.03E-01	9.36E-03	1.41E-03	1.14E-01	4.37E-01	2.6E-01
	Deer Mouse	5.95E-01	3.33E-02	2.64E-03	6.31E-01	4.37E-01	1.4E+00
	Eastern Cottontail	5.12E-02	1.56E-02	1.76E-03	6.86E-02	4.37E-01	1.6E-01
	Mallard	9.66E-01	4.37E-03	1.03E-03	9.71E-01	6.10E-01	1.6E+00
	Meadow Vole	2.88E-01	5.62E-02	2.50E-03	3.46E-01	4.37E-01	7.9E-01
	Mink	6.66E-01	5.33E-02	1.81E-03	7.21E-01	4.37E-01	1.7E+00
	Mule Deer	3.36E-02	3.12E-03	1.19E-03	3.79E-02	4.37E-01	8.7E-02
	Northern Bobwhite	1.40E-01	1.98E-02	1.85E-03	1.61E-01	6.10E-01	2.6E-01
	Northern Harrier	3.14E-01	7.28E-03	1.34E-03	3.23E-01	6.10E-01	5.3E-01
	Raccoon	2.48E-01	2.72E-02	1.48E-03	2.77E-01	4.37E-01	6.3E-01
	Red-Winged Blackbird	2.85E-01	3.33E-02	3.02E-03	3.21E-01	6.10E-01	5.3E-01
	Song Sparrow	2.02E-01	4.99E-02	3.71E-03	2.55E-01	6.10E-01	4.2E-01

Notes:

NC - Exposure not calculated for belted kingfisher in locations without fish and exposure to mallard not estimated at locations without aquatic vegetation and/or aquatic invertebrate data available.

LOAEL - Lowest Observed Adverse Effect Level

NOAEL - No-Observed Adverse Effect Level

mg/kg BW/day - milligram per kilogram of body weight per day

TRV - Toxicity Reference Value

TABLE 4-33
Hazard Quotients Calculated Using Alternative TRV for Vanadium

Location	Receptor	Exposure Food (mg/kg BW/day	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg BW/day)	Exposure Total (mg/kg BW/day)	Toxicity Reference Value	Hazard Quotient
						Geometric Mean NOAEL for Growth and Reproduction (mg/kg BW/day)	
By Mine Panel							
A Panel Area 1	American Robin	4.00E-01	4.52E-01	1.33E-02	8.66E-01	1.19E+00	7.3E-01
A Panel Area 2		4.13E-01	7.81E-01	1.33E-02	1.21E+00	1.19E+00	1.0E+00
D Panel North		6.39E-01	6.28E-01	4.76E-03	1.27E+00	1.19E+00	1.1E+00
D Panel South		4.09E-01	7.88E-01	4.76E-03	1.20E+00	1.19E+00	1.0E+00
E Panel Area 1		5.92E-01	2.86E-01	9.25E-03	8.88E-01	1.19E+00	7.5E-01
E Panel Area 2		1.26E-01	1.10E-01	9.25E-03	2.45E-01	1.19E+00	2.1E-01
North Sage Valley		6.86E-02	1.23E-01	1.14E-03	1.92E-01	1.19E+00	1.6E-01
Pole Canyon ODA		1.75E-01	6.51E-01	7.04E-04	8.27E-01	1.19E+00	6.9E-01
A Panel Area 1	Northern Harrier	1.35E-01	1.17E-01	7.15E-03	2.60E-01	1.19E+00	2.2E-01
A Panel Area 2		3.69E-01	2.02E-01	7.15E-03	5.79E-01	1.19E+00	4.9E-01
D Panel North		1.15E-01	1.63E-01	7.15E-03	2.85E-01	1.19E+00	2.4E-01
D Panel South		2.40E-01	2.04E-01	7.15E-03	4.51E-01	1.19E+00	3.8E-01
E Panel Area 1		1.19E-01	7.42E-02	7.15E-03	2.00E-01	1.19E+00	1.7E-01
E Panel Area 2		8.86E-02	2.85E-02	7.15E-03	1.24E-01	1.19E+00	1.0E-01
North Sage Valley		9.28E-02	3.18E-02	7.15E-03	1.32E-01	1.19E+00	1.1E-01
Pole Canyon ODA		1.61E-01	1.69E-01	7.15E-03	3.37E-01	1.19E+00	2.8E-01
By Reclamation Type							
Dinwoody	American Robin	1.26E-01	1.10E-01	NC	1.17E-01	1.19E+00	9.8E-02
No Cover		5.11E-01	1.07E+00	NC	5.36E-01	1.19E+00	4.5E-01
Topsoil Over Chert		3.89E-01	4.84E-01	NC	2.55E-01	1.19E+00	2.1E-01
Topsoil Only		2.74E-01	5.42E-01	NC	3.47E-01	1.19E+00	2.9E-01
Dinwoody	Northern Harrier	8.86E-02	2.85E-02	NC	1.17E-01	1.19E+00	9.8E-02
No Cover		2.59E-01	2.76E-01	NC	5.36E-01	1.19E+00	4.5E-01
Topsoil Over Chert		1.29E-01	1.25E-01	NC	2.55E-01	1.19E+00	2.1E-01
Topsoil Only		2.06E-01	1.41E-01	NC	3.47E-01	1.19E+00	2.9E-01

TABLE 4-33
Hazard Quotients Calculated Using Alternative TRV for Vanadium

Location	Receptor	Exposure Food (mg/kg BW/day	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg BW/day)	Exposure Total (mg/kg BW/day)	Toxicity Reference Value	Hazard Quotient
						Geometric Mean NOAEL for Growth and Reproduction (mg/kg BW/day)	
Location-by-Location							
DS-7	American Robin	5.15E-01	6.78E-01	2.70E-03	1.19E+00	1.19E+00	1.0E+00
ES-3		1.04E+00	1.42E-01	6.83E-03	1.19E+00	1.19E+00	1.0E+00
ES-4		1.12E-01	1.17E-01	6.83E-03	2.36E-01	1.19E+00	2.0E-01
HS-3		1.91E-01	5.51E-02	2.72E-04	2.46E-01	1.19E+00	2.1E-01
HS-CC1		6.83E-02	4.37E-02	2.48E-04	1.12E-01	1.19E+00	9.4E-02
HS-CC2		5.36E-02	1.08E-01	2.48E-04	1.62E-01	1.19E+00	1.4E-01
LP-PD		1.12E-01	8.96E-02	1.57E-04	2.02E-01	1.19E+00	1.7E-01
LS		8.72E-02	9.50E-02	2.17E-04	1.82E-01	1.19E+00	1.5E-01
LSm		7.56E-02	1.33E-01	5.13E-04	2.09E-01	1.19E+00	1.8E-01
LSS		8.82E-02	3.08E-01	8.74E-04	3.97E-01	1.19E+00	3.3E-01
DS-7	Mallard	0.00E+00	0.00E+00	1.12E-03	1.12E-03	1.19E+00	9.4E-04
ES-3		0.00E+00	0.00E+00	2.82E-03	2.82E-03	1.19E+00	2.4E-03
ES-4		0.00E+00	0.00E+00	2.82E-03	2.82E-03	1.19E+00	2.4E-03
HS-3		2.90E-01	7.94E-02	1.12E-04	3.69E-01	1.19E+00	3.1E-01
HS-CC1		2.21E-01	3.73E-02	1.03E-04	2.59E-01	1.19E+00	2.2E-01
HS-CC2		2.22E-01	9.18E-02	1.03E-04	3.14E-01	1.19E+00	2.6E-01
LP-PD		1.02E+00	1.45E-01	6.50E-05	1.16E+00	1.19E+00	9.7E-01
LS		1.15E+00	6.33E-02	8.95E-05	1.21E+00	1.19E+00	1.0E+00
LSm		8.40E-01	6.81E-02	2.12E-04	9.08E-01	1.19E+00	7.6E-01
LSS		6.36E-01	7.89E-02	3.61E-04	7.15E-01	1.19E+00	6.0E-01
DS-7	Red-Winged Blackbird	2.25E-01	8.03E-01	3.27E-03	1.03E+00	1.19E+00	8.7E-01
ES-3		4.16E-01	1.68E-01	8.27E-03	5.92E-01	1.19E+00	5.0E-01
ES-4		5.60E-02	1.38E-01	8.27E-03	2.02E-01	1.19E+00	1.7E-01
HS-3		7.90E-02	6.53E-02	3.29E-04	1.45E-01	1.19E+00	1.2E-01
HS-CC1		3.97E-02	5.18E-02	3.01E-04	9.18E-02	1.19E+00	7.7E-02
HS-CC2		3.03E-02	1.28E-01	3.01E-04	1.58E-01	1.19E+00	1.3E-01
LP-PD		5.50E-02	1.06E-01	1.90E-04	1.61E-01	1.19E+00	1.4E-01
LS		5.32E-02	1.13E-01	2.62E-04	1.66E-01	1.19E+00	1.4E-01
LSm		4.76E-02	1.57E-01	6.21E-04	2.06E-01	1.19E+00	1.7E-01
LSS		5.08E-02	3.65E-01	1.06E-03	4.17E-01	1.19E+00	3.5E-01

TABLE 4-33
Hazard Quotients Calculated Using Alternative TRV for Vanadium

Location	Receptor	Exposure Food (mg/kg BW/day	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg BW/day)	Exposure Total (mg/kg BW/day)	Toxicity Reference Value	Hazard Quotient
						Geometric Mean NOAEL for Growth and Reproduction (mg/kg BW/day)	
DS-7	Song Sparrow	1.49E-01	1.20E+00	4.02E-03	1.36E+00	1.19E+00	1.1E+00
ES-3		1.99E-01	2.52E-01	1.01E-02	4.62E-01	1.19E+00	3.9E-01
ES-4		5.04E-02	2.07E-01	1.01E-02	2.68E-01	1.19E+00	2.3E-01
HS-3		4.32E-02	9.79E-02	4.04E-04	1.42E-01	1.19E+00	1.2E-01
HS-CC1		4.56E-02	7.78E-02	3.69E-04	1.24E-01	1.19E+00	1.0E-01
HS-CC2		3.36E-02	1.92E-01	3.69E-04	2.25E-01	1.19E+00	1.9E-01
LP-PD		4.80E-02	1.59E-01	2.34E-04	2.08E-01	1.19E+00	1.7E-01
LS		6.48E-02	1.69E-01	3.22E-04	2.34E-01	1.19E+00	2.0E-01
LSm		6.00E-02	2.36E-01	7.63E-04	2.97E-01	1.19E+00	2.5E-01
LSS		5.76E-02	5.47E-01	1.30E-03	6.06E-01	1.19E+00	5.1E-01
DS-7	Northern Harrier	9.98E-02	1.76E-01	1.45E-03	2.77E-01	1.19E+00	2.3E-01
ES-3		1.05E-01	3.68E-02	3.66E-03	1.45E-01	1.19E+00	1.2E-01
ES-4		6.55E-02	3.02E-02	3.66E-03	9.94E-02	1.19E+00	8.4E-02
HS-3		2.95E-02	1.43E-02	1.46E-04	4.39E-02	1.19E+00	3.7E-02
HS-CC1		3.33E-02	1.13E-02	1.33E-04	4.48E-02	1.19E+00	3.8E-02
HS-CC2		3.31E-02	2.79E-02	1.33E-04	6.12E-02	1.19E+00	5.1E-02
LP-PD		7.63E-02	2.32E-02	8.44E-05	9.96E-02	1.19E+00	8.4E-02
LS		4.72E-02	2.46E-02	1.16E-04	7.20E-02	1.19E+00	6.0E-02
LSm		4.21E-02	3.44E-02	2.75E-04	7.68E-02	1.19E+00	6.5E-02
LSS		6.20E-02	7.98E-02	4.68E-04	1.42E-01	1.19E+00	1.2E-01

Notes:

NC - Not calculated. Surface water exposure estimated at locations containing surface water and in panel-by-panel assessments only.

LOAEL - Lowest Observed Adverse Effect Level

NOAEL - No-Observed Adverse Effect Level

mg/kg BW/day - milligram per kilogram of body weight per day

TRV - Toxicity Reference Value

ODA - Overburden Disposal Area

TABLE 4-34
Hazard Quotients Calculated Using Alternative TRV for Zinc

Location	Receptor	Exposure Food (mg/kg BW/day)	Exposure Soil/ Sediment (mg/kg BW/day)	Exposure Surface Water (mg/kg BW/day)	Exposure Total (mg/kg BW/day)	Toxicity Reference Value LOAEL (mg/kg BW/day)	Hazard Quotient
By Mine Panel							
North Sage Valley	Northern Harrier	1.44E+02	1.18E-01	1.18E-01	1.44E+02	79.8	1.8E+00
Pole Canyon ODA		1.47E+02	6.03E-01	1.18E-01	1.47E+02	79.8	1.8E+00
Panel A Area 1		5.99E+01	2.22E-01	1.18E-01	6.02E+01	79.8	7.5E-01
Panel A Area 2		1.05E+02	5.76E-01	1.18E-01	1.05E+02	79.8	1.3E+00
Panel D North		6.94E+01	4.23E-01	1.18E-01	6.99E+01	79.8	8.8E-01
Panel D South		1.09E+02	4.58E-01	1.18E-01	1.10E+02	79.8	1.4E+00
Panel E Area 1		5.84E+01	2.42E-01	1.18E-01	5.88E+01	79.8	7.4E-01
Panel E Area 2		4.20E+01	8.62E-02	1.18E-01	4.22E+01	79.8	5.3E-01
Site-wide		8.45E+01	3.50E-01	1.90E-02	8.48E+01	79.8	1.1E+00
By Reclamation Type							
Dinwoody	Northern Harrier	4.20E+01	8.62E-02	NC	4.21E+01	79.8	5.3E-01
No Cover		8.87E+01	6.39E-01	NC	8.94E+01	79.8	1.1E+00
Topsoil Over Chert		6.60E+01	2.93E-01	NC	6.63E+01	79.8	8.3E-01
Topsoil Only		9.51E+01	4.58E-01	NC	9.55E+01	79.8	1.2E+00
Riparian Locations							
LSS	Northern Harrier	1.62E+02	1.90E-01	1.44E-03	1.62E+02	79.8	2.0E+00
DS-7		1.05E+02	8.68E-01	4.01E-02	1.06E+02	79.8	1.3E+00
ES-3		9.15E+01	1.05E-01	1.46E-02	9.16E+01	79.8	1.1E+00
ES-4		7.17E+01	8.33E-02	1.46E-02	7.18E+01	79.8	9.0E-01
HS-3		6.07E+01	3.75E-02	2.16E-04	6.07E+01	79.8	7.6E-01
HS-CC1		4.27E+01	4.49E-02	4.48E-04	4.27E+01	79.8	5.4E-01
HS-CC2		4.27E+01	4.85E-02	4.48E-04	4.27E+01	79.8	5.4E-01
LP-PD		5.09E+01	8.05E-02	2.84E-04	5.10E+01	79.8	6.4E-01
LS		3.71E+01	6.44E-02	3.43E-04	3.72E+01	79.8	4.7E-01
LSm		1.09E+02	8.61E-02	6.93E-04	1.09E+02	79.8	1.4E+00

Notes:

NC - Not calculated. Surface water exposure estimated at locations containing surface water and in panel-by-panel assessments only.

LOAEL - Lowest Observed Adverse Effect Level

mg/kg BW/day - milligram per kilogram of body weight per day

TRV - Toxicity Reference Value

ODA - Overburden Disposal Area

TABLE 6-1
Summary of Drainages where HQs are Greater than 1 by Media

ECOPC	Media	Smoky Creek	Roberts Creek	Tygee Creek	Pole Canyon Creek	North Fork Sage Creek and North Sage Valley	Sage Creek	Hoopes Spring	South Fork Sage Creek	Lower Sage Valley	Crow Creek
Aluminum	Surface Water	---	---	---	---	---	---	---	---	---	---
	Sediment	---	---	---	---	---	---	---	---	---	---
	Fish Tissue	**12**	NF	**5**	NF	NF	**4**	**5**	**2**	**2**	**2**
Arsenic	Surface Water	---	---	---	**2**	---	---	---	---	---	---
	Sediment	---	---	---	---	---	---	---	---	---	---
	Fish Tissue	---	NF	---	NF	NF	---	---	---	---	---
Barium	Surface Water	---	---	---	---	---	---	---	---	---	---
	Sediment	**2**	---	---	**3**	**3**	**4****	---	---	**2**	---
	Fish Tissue	Uncertain	NF	Uncertain	NF	NF	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain
Beryllium	Surface Water	---	---	---	---	---	---	---	---	---	---
	Sediment	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain
	Fish Tissue	---	---	---	---	---	---	---	---	---	---
Cadmium	Surface Water	---	---	---	**33**	---	---	---	---	---	---
	Sediment	---	---	---	**9**	---	**3****	---	---	---	---
	Fish Tissue	---	NF	---	NF	NF	---	---	---	---	---
Chromium	Surface Water	---	---	---	---	---	---	---	---	---	---
	Sediment	---	---	---	**3**	---	---	---	---	---	---
	Fish Tissue	---	NF	---	NF	NF	---	---	---	---	---
Copper	Surface Water	---	---	---	---	---	---	---	---	---	---
	Sediment	---	---	---	---	---	---	---	---	---	---
	Fish Tissue	---	NF	---	NF	NF	**2**	---	---	**2**	**2**
Iron	Surface Water	---	---	---	---	**2**	**2**	---	---	---	---
	Sediment	---	---	---	---	---	---	---	---	---	---
	Fish Tissue	**9**	NF	**5**	NF	NF	**4**	**3**	**3**	**3**	**3**
Manganese	Surface Water	---	---	---	---	---	---	---	---	---	---
	Sediment	---	---	---	---	**5**	---	---	---	**2**	---
	Fish Tissue	Uncertain	NF	Uncertain	NF	NF	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain
Nickel	Surface Water	---	---	---	**5**	---	---	---	---	---	---
	Sediment	---	---	---	**6**	---	---	---	---	---	---
	Fish Tissue	---	NF	---	NF	NF	---	---	---	---	---
Selenium	Surface Water*	---	---	---	**1166**	**2**	---	**9**	**3**	**5**	**2**
	Sediment	---	---	---	**12**	**2**	---	**3**	---	**2**	---
	Fish Tissue	---	---	---	NF	NF	---	**2**	---	**2**	---
	Benthic Tissue	---	---	---	---	---	---	---	---	**2**	---
	Amphibian Tissue	---	---	---	---	---	---	---	---	---	---
Vanadium	SW	---	---	---	---	---	---	---	---	---	---
	Sediment	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain
	Fish Tissue	---	---	---	---	---	---	---	---	---	---
Zinc	Surface Water	---	---	---	**6**	**2**	---	---	---	---	---
	Sediment	---	---	---	**6**	---	---	---	---	---	---
	Fish Tissue	**4**	NF	**4**	NF	NF	**4**	**7**	**7**	**8**	**10**

Notes:
'--- = HQ<1
NF - No Fish, HQ - Hazard Quotient, ECOPC - Ecological Chemical of Potential Concern
*See Table 3-23 for specific locations where HQs are elevated. HQs presented there are for location specific selenium concentrations.
**Sediment specific HQs >1 identified for Sage Creek occur at SV-1, an irrigation ditch, not in the mainstem Sage Creek.
ERA - Ecological Risk Assessment, PEC - Probable Effects Concentration, TEC - Threshold Effect Concentration, TRV - Toxicity Reference Value
ECOPCs not shown are those that were screened out of the risk characterizaton process.
No beryllium and vanadium TRVs are available for sediments.
Sediment risk characterization presented in this summary is based on HQs derived relative to the PEC. This ERA acknowledges that uncertainties exist at ECOPC concentrations between the TEC and PEC.
Surface water HQs presented are those derived based on the chronic thresholds.

TABLE 6-2
Risk Characterization Summary for Upland Receptors

ECOPC	Receptor	Panel A Area 1	Panel A Area 2	Panel D North	Panel D South	Panel E Area 1	Panel E Area 2	Pole Canyon ODA	North Sage Valley	No Cover	Topsoil Only	Topsoil Over Chert	Dinwoody
Cadmium	American Robin	---	---	---	---	---	---	---	---	---	---	---	---
	Coyote	---	---	---	---	---	---	---	---	---	---	---	---
	Deer Mouse	LOAEL HQ < 1 GM NOAEL HQ < 1	**LOAEL HQ = 1.5** **GM NOAEL HQ < 1**	**LOAEL HQ = 1.2** **GM NOAEL HQ <1**	LOAEL HQ < 1 GM NOAEL HQ < 1	**LOAEL HQ = 2.0** **GM NOAEL HQ < 1**	LOAEL HQ < 1 GM NOAEL HQ < 1	**LOAEL HQ = 1.2** **GM NOAEL HQ < 1**	LOAEL HQ < 1 GM NOAEL HQ < 1	**LOAEL HQ = 1.2** **GM NOAEL HQ < 1**	**LOAEL HQ = 1.2** **GM NOAEL HQ < 1**	LOAEL HQ < 1 GM NOAEL HQ < 1	LOAEL HQ < 1 GM NOAEL HQ < 1
	Eastern Cottontail	---	---	---	---	---	---	---	---	---	---	---	---
	Mule Deer	---	---	---	---	---	---	---	---	---	---	---	---
	Northern Bobwhite	---	---	---	---	---	---	---	---	---	---	---	---
	Northern Harrier	---	---	---	---	---	---	---	---	---	---	---	---
Copper	American Robin	---	---	---	---	---	---	---	---	---	---	---	---
	Coyote	**LOAEL HQ = 2.6**	LOAEL HQ < 1	**LOAEL HQ = 2.4**	**LOAEL HQ = 4.2**	**LOAEL HQ = 1.7**	**LOAEL HQ = 1.6**	**LOAEL HQ = 18**	**LOAEL HQ = 2.6**	**LOAEL HQ = 2.2**	**LOAEL HQ = 5.9**	**LOAEL HQ = 2.5**	**LOAEL HQ = 1.6**
	Deer Mouse	---	---	---	---	---	---	---	---	---	---	---	---
	Eastern Cottontail	---	---	---	---	---	---	---	---	---	---	---	---
	Mule Deer	---	---	---	---	---	---	---	---	---	---	---	---
	Northern Bobwhite	---	---	---	---	---	---	---	---	---	---	---	---
	Northern Harrier	**LOAEL HQ = 12**	**LOAEL HQ = 4.1**	**LOAEL HQ = 11**	**LOAEL HQ = 20**	**LOAEL HQ = 8.1**	**LOAEL HQ = 7.6**	**LOAEL HQ = 85**	**LOAEL HQ = 2.6**	**LOAEL HQ = 10**	**LOAEL HQ = 28**	**LOAEL HQ = 12**	**LOAEL HQ = 7.6**
Lead	American Robin	---	---	---	---	---	---	---	---	---	---	---	---
	Coyote	**LOAEL HQ = 1.4** **GM NOAEL HQ < 1**	LOAEL HQ < 1 GM NOAEL HQ < 1	LOAEL HQ < 1 GM NOAEL HQ < 1	LOAEL HQ < 1 GM NOAEL HQ < 1	LOAEL HQ < 1 GM NOAEL HQ < 1	LOAEL HQ < 1 GM NOAEL HQ < 1	**LOAEL HQ = 1.4** **GM NOAEL HQ < 1**	LOAEL HQ < 1 GM NOAEL HQ < 1	**LOAEL HQ = 3.1** **GM NOAEL HQ < 1**	LOAEL HQ < 1 GM NOAEL HQ < 1	LOAEL HQ < 1 GM NOAEL HQ < 1	LOAEL HQ < 1 GM NOAEL HQ < 1
	Deer Mouse	---	---	---	---	---	---	---	---	---	---	---	---
	Eastern Cottontail	---	---	---	---	---	---	---	---	---	---	---	---
	Mule Deer	---	---	---	---	---	---	---	---	---	---	---	---
	Northern Bobwhite	---	---	---	---	---	---	---	---	---	---	---	---
	Northern Harrier	**LOAEL HQ = 12** **GM NOAEL HQ =2.1**	LOAEL HQ < 1 GM NOAEL HQ < 1	**LOAEL HQ = 1.1** **GM NOAEL HQ < 1**	**LOAEL HQ = 2.8** **GM NOAEL HQ < 1**	**LOAEL HQ = 7.7** **GM NOAEL HQ = 1.4**	**LOAEL HQ = 2.6** **GM NOAEL HQ < 1**	**LOAEL HQ = 12** **GM NOAEL HQ = 2.1**	LOAEL HQ < 1 GM NOAEL HQ < 1	**LOAEL HQ = 26** **GM NOAEL HQ = 1.1**	**LOAEL HQ = 1.9** **GM NOAEL HQ < 1**	**LOAEL HQ = 4.2** **GM NOAEL HQ < 1**	**LOAEL HQ = 2.6** **GM NOAEL HQ < 1**

TABLE 6-2
Risk Characterization Summary for Upland Receptors

ECOPC	Receptor	Panel A Area 1	Panel A Area 2	Panel D North	Panel D South	Panel E Area 1	Panel E Area 2	Pole Canyon ODA	North Sage Valley	No Cover	Topsoil Only	Topsoil Over Chert	Dinwoody
Selenium	American Robin	**LOAEL HQ = 3.7 GM NOAEL HQ < 1**	**LOAEL HQ = 21 GM NOAEL HQ = 11**	**LOAEL HQ = 26 GM NOAEL HQ = 15**	**LOAEL HQ = 20 GM NOAEL HQ = 11**	**LOAEL HQ = 4.3 GM NOAEL HQ = 1.1**	**LOAEL HQ = 4.4 GM NOAEL HQ = 1.1**	**LOAEL HQ = 15 GM NOAEL HQ = 9.0**	**LOAEL HQ = 5.4 GM NOAEL HQ = 1.7**	**LOAEL HQ = 24 GM NOAEL HQ = 14**	**LOAEL HQ = 17 GM NOAEL HQ = 10**	**LOAEL HQ = 9.7 GM NOAEL HQ = 5.8**	**LOAEL HQ = 1.9 GM NOAEL HQ = 1.1**
	Coyote	**LOAEL HQ = 6.5 GM NOAEL HQ < 1**	**LOAEL HQ = 9.3 GM NOAEL HQ = 1.9**	**LOAEL HQ = 15 GM NOAEL HQ =4.6**	**LOAEL HQ = 12 GM NOAEL HQ = 3.7**	**LOAEL HQ = 4.4 GM NOAEL HQ < 1**	**LOAEL HQ = 4.1 GM NOAEL HQ < 1**	**LOAEL HQ = 16 GM NOAEL HQ =5.2**	**LOAEL HQ = 4.2 GM NOAEL HQ < 1**	**LOAEL HQ = 11 GM NOAEL HQ = 3.6**	**LOAEL HQ = 9.8 GM NOAEL HQ = 3.2**	**LOAEL HQ = 5.7 GM NOAEL HQ = 1.9**	**LOAEL HQ < 1 GM NOAEL HQ < 1**
	Deer Mouse	**LOAEL HQ = 9.5 GM NOAEL HQ < 1**	**LOAEL HQ = 56 GM NOAEL HQ = 16**	**LOAEL HQ = 64 GM NOAEL HQ = 20**	**LOAEL HQ = 49 GM NOAEL HQ = 15**	**LOAEL HQ = 11 GM NOAEL HQ = 1.5**	**LOAEL HQ = 11 GM NOAEL HQ = 1.4**	**LOAEL HQ = 38 GM NOAEL HQ = 12**	**LOAEL HQ = 14 GM NOAEL HQ = 2.3**	**LOAEL HQ = 60 GM NOAEL HQ = 20**	**LOAEL HQ = 43 GM NOAEL HQ = 14**	**LOAEL HQ = 23 GM NOAEL HQ = 7.8**	**LOAEL HQ = 4.4 GM NOAEL HQ = 1.4**
	Eastern Cottontail	**LOAEL HQ = 4.8 GM NOAEL HQ < 1**	**LOAEL HQ = 22 GM NOAEL HQ = 5.9**	**LOAEL HQ = 17 GM NOAEL HQ = 5.3**	**LOAEL HQ = 13 GM NOAEL HQ = 4.1**	**LOAEL HQ = 5.3 GM NOAEL HQ < 1**	**LOAEL HQ = 4.5 GM NOAEL HQ < 1**	**LOAEL HQ = 11 GM NOAEL HQ = 3.5**	**LOAEL HQ = 5.0 GM NOAEL HQ < 1**	**LOAEL HQ = 13 GM NOAEL HQ = 4.2**	**LOAEL HQ = 12 GM NOAEL HQ = 4.0**	**LOAEL HQ = 3.6 GM NOAEL HQ = 1.1**	**LOAEL HQ < 1 GM NOAEL HQ < 1**
	Mule Deer	**LOAEL HQ = 3.2 GM NOAEL HQ < 1**	**LOAEL HQ = 14 GM NOAEL HQ = 3.6**	**LOAEL HQ = 11 GM NOAEL HQ = 3.4**	**LOAEL HQ = 8.7 GM NOAEL HQ = 2.7**	**LOAEL HQ = 3.5 GM NOAEL HQ < 1**	**LOAEL HQ = 3.1 GM NOAEL HQ < 1**	**LOAEL HQ = 7.0 GM NOAEL HQ = 2.3**	**LOAEL HQ = 3.4 GM NOAEL HQ < 1**	**LOAEL HQ = 8.2 GM NOAEL HQ = 2.7**	**LOAEL HQ = 7.7 GM NOAEL HQ = 2.5**	**LOAEL HQ = 2.3 GM NOAEL HQ < 1**	**LOAEL HQ < 1 GM NOAEL HQ < 1**
	Northern Bobwhite	**LOAEL HQ = 2.2 GM NOAEL HQ < 1**	**LOAEL HQ = 12 GM NOAEL HQ = 6.1**	**LOAEL HQ = 10 GM NOAEL HQ = 6.0**	**LOAEL HQ = 7.9 GM NOAEL HQ = 4.5**	**LOAEL HQ = 2.4 GM NOAEL HQ < 1**	**LOAEL HQ = 2.1 GM NOAEL HQ < 1**	**LOAEL HQ = 6.2 GM NOAEL HQ = 3.7**	**LOAEL HQ = 2.5 GM NOAEL HQ < 1**	**LOAEL HQ = 8.7 GM NOAEL HQ = 5.2**	**LOAEL HQ = 7.6 GM NOAEL HQ = 4.5**	**LOAEL HQ = 2.8 GM NOAEL HQ = 1.7**	**LOAEL HQ < 1 GM NOAEL HQ < 1**
	Northern Harrier	**LOAEL HQ = 5.1 GM NOAEL HQ 2.2**	**LOAEL HQ = 7.3 GM NOAEL HQ = 3.5**	**LOAEL HQ = 15 GM NOAEL HQ = 8.7**	**LOAEL HQ = 12 GM NOAEL HQ = 6.8**	**LOAEL HQ = 2.3 GM NOAEL HQ < 1**	**LOAEL HQ = 2.0 GM NOAEL HQ < 1**	**LOAEL HQ = 16 GM NOAEL HQ = 9.9**	**LOAEL HQ = 2.1 GM NOAEL HQ < 1**	**LOAEL HQ = 13 GM NOAEL HQ = 7.9**	**LOAEL HQ = 12 GM NOAEL HQ = 7.0**	**LOAEL HQ = 7 GM NOAEL HQ = 4.2**	**LOAEL HQ < 1 GM NOAEL HQ < 1**
Vanadium	American Robin	**LOAEL HQ = 2.1 GM NOAEL < 1**	**LOAEL HQ = 2.9 GM NOAEL = 1.0**	**LOAEL HQ = 3.1 GM NOAEL = 1.1**	**LOAEL HQ = 2.9 GM NOAEL = 1.0**	**LOAEL HQ = 2.2 GM NOAEL < 1**	LOAEL HQ < 1 GM NOAEL < 1	**LOAEL HQ = 2.0 GM NOAEL < 1**	LOAEL HQ < 1 GM NOAEL < 1	**LOAEL HQ = 3.8 GM NOAEL < 1**	**LOAEL HQ = 2.0 GM NOAEL < 1**	**LOAEL HQ = 2.1 GM NOAEL < 1**	LOAEL HQ < 1 GM NOAEL < 1
	Coyote	---	---	---	---	---	---	---	---	---	---	---	---
	Deer Mouse	---	---	---	---	---	---	---	---	---	---	---	---
	Eastern Cottontail	---	---	---	---	---	---	---	---	---	---	---	---
	Mule Deer	---	---	---	---	---	---	---	---	---	---	---	---
	Northern Bobwhite	LOAEL HQ = 1.0 GM NOAEL < 1	**LOAEL HQ = 1.6 GM NOAEL < 1**	**LOAEL HQ = 1.4 GM NOAEL < 1**	**LOAEL HQ = 1.6 GM NOAEL < 1**	LOAEL HQ < 1 GM NOAEL < 1	LOAEL HQ < 1 GM NOAEL < 1	**LOAEL HQ = 1.2 GM NOAEL < 1**	LOAEL HQ < 1 GM NOAEL < 1	**LOAEL HQ = 2.0 GM NOAEL < 1**	**LOAEL HQ = 1.1 GM NOAEL < 1**	LOAEL HQ = 1.0 GM NOAEL < 1	LOAEL HQ < 1 GM NOAEL < 1
	Northern Harrier	LOAEL HQ < 1 GM NOAEL HQ < 1	**LOAEL HQ = 1.4 GM NOAEL HQ < 1**	LOAEL HQ < 1 GM NOAEL HQ < 1	**LOAEL HQ = 1.1 GM NOAEL HQ < 1**	LOAEL HQ < 1 GM NOAEL HQ < 1	LOAEL HQ < 1 GM NOAEL HQ < 1	LOAEL HQ < 1 GM NOAEL HQ < 1	LOAEL HQ < 1 GM NOAEL HQ < 1	**LOAEL HQ = 1.3 GM NOAEL HQ < 1**	LOAEL HQ < 1 GM NOAEL HQ < 1	LOAEL HQ < 1 GM NOAEL HQ < 1	LOAEL HQ < 1 GM NOAEL HQ < 1
Zinc	American Robin	---	---	---	---	---	---	---	---	---	---	---	---
	Coyote	---	---	---	---	---	---	---	---	---	---	---	---
	Deer Mouse	---	---	---	---	---	---	---	---	---	---	---	---
	Eastern Cottontail	---	---	---	---	---	---	---	---	---	---	---	---
	Mule Deer	---	---	---	---	---	---	---	---	---	---	---	---
	Northern Bobwhite	---	---	---	---	---	---	---	---	---	---	---	---
	Northern Harrier	LOAEL HQ < 1 REV LOAEL HQ < 1	**LOAEL HQ = 1.6 REV LOAEL HQ = 1.3**	**LOAEL HQ = 1.1 REV LOAEL HQ < 1**	**LOAEL HQ = 1.7 REV LOAEL HQ = 1.3**	LOAEL HQ < 1 REV LOAEL HQ < 1	LOAEL HQ < 1 REV LOAEL HQ < 1	**LOAEL HQ = 2.2 REV LOAEL HQ = 1.8**	**LOAEL HQ = 2.2 REV LOAEL HQ = 1.8**	**LOAEL HQ = 1.3 REV LOAEL HQ = 1.1**	**LOAEL HQ = 1.4 REV LOAEL HQ = 1.2**	LOAEL HQ = 1.0 REV LOAEL HQ < 1	LOAEL HQ < 1 REV LOAEL HQ < 1

Notes:
--- = Not an ECOC
ECOPC - Ecological Chemical of Potential Concern, ECOC - Ecological Chemical of Concern, LOAEL - Lowest Observed Adverse Effects Level, NOAEL - No-Observed Adverse Effects Levels, HQ - Hazard Quotient
The RI COPC was not idenitified as an ECOPC for the receptor.
Tier 3 - The Tier 2 HQ calculated using the lowest LOAEL TRV was greater than 1.0 and potential risks are discussed in more detail in the Tier 3 Risk Characterization.
EcoSSL - Ecological Soil Screening Level, ODA - Overburden Disposal Area, RI COPC - Remedial Investigation Chemical of Potential Concern, TRV - Toxicity Reference Value
GM NOAEL - Geometric mean of the Eco SSL NOAEL for growth and reproduction. Discussed further for each ECOC in Section 4.
REV LOAEL - Revised LOAEL for zinc.

TABLE 6-3
Riparian Risk Characterization Summary

ECOPC	Receptor	DS-7	ES-3	ES-4	HS-3	HS-CC1	HS-CC2	LP-PD	LS	LSm	LSS
Cadmium	American Robin	---	---	---	---	---	---	---	---	---	---
	Belted Kingfisher	---	---	---	---	---	---	---	---	---	---
	Coyote	---	---	---	---	---	---	---	---	---	---
	Deer Mouse	**LOAEL HQ = 1.5 GM NOAEL HQ < 1**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1
	Eastern Cottontail	---	---	---	---	---	---	---	---	---	---
	Mallard	---	---	---	---	---	---	---	---	---	---
	Meadow Vole	---	---	---	---	---	---	---	---	---	---
	Mink	---	---	---	---	---	---	---	---	---	---
	Mule Deer	---	---	---	---	---	---	---	---	---	---
	Northern Bobwhite	---	---	---	---	---	---	---	---	---	---
	Northern Harrier	---	---	---	---	---	---	---	---	---	---
	Raccoon	---	---	---	---	---	---	---	---	---	---
	Red-Winged Blackbird	---	---	---	---	---	---	---	---	---	---
	Song Sparrow	---	---	---	---	---	---	---	---	---	---
Chromium	American Robin	---	---	---	---	---	---	---	---	---	---
	Belted Kingfisher	---	---	---	---	---	---	---	---	---	---
	Coyote	---	---	---	---	---	---	---	---	---	---
	Deer Mouse	---	---	---	---	---	---	---	---	---	---
	Eastern Cottontail	---	---	---	---	---	---	---	---	---	---
	Mallard	---	---	---	---	---	---	---	---	---	---
	Meadow Vole	---	---	---	---	---	---	---	---	---	---
	Mink	---	---	---	---	---	---	---	---	---	---
	Mule Deer	---	---	---	---	---	---	---	---	---	---
	Northern Bobwhite	---	---	---	---	---	---	---	---	---	---
	Northern Harrier	---	---	---	---	---	---	---	---	---	---
	Raccoon	---	---	---	---	---	---	---	---	---	---
	Red-Winged Blackbird	---	---	---	---	---	---	---	---	---	---
	Song Sparrow	**LOAEL HQ = 1.2 ALT LOAEL HQ < 1**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1
Copper	American Robin	---	---	---	---	---	---	---	---	---	---
	Belted Kingfisher	---	---	---	---	---	---	---	---	---	---
	Coyote	**LOAEL HQ = 2.0**	LOAEL HQ < 1	**LOAEL HQ = 1.4**	**LOAEL HQ = 6.6**	**LOAEL HQ = 1.2**	**LOAEL HQ = 1.2**	LOAEL HQ < 1	**LOAEL HQ = 1.1**	LOAEL HQ < 1	**LOAEL HQ = 3.9**
	Deer Mouse	---	---	---	---	---	---	---	---	---	---
	Eastern Cottontail	---	---	---	---	---	---	---	---	---	---
	Mallard	---	---	---	---	---	---	---	---	---	---
	Meadow Vole	---	---	---	---	---	---	---	---	---	---
	Mink	---	---	---	---	---	---	---	---	---	---
	Mule Deer	---	---	---	---	---	---	---	---	---	---
	Northern Bobwhite	---	---	---	---	---	---	---	---	---	---
	Northern Harrier	**LOAEL HQ = 9.6**	**LOAEL HQ = 2.1**	**LOAEL HQ = 6.5**	**LOAEL HQ = 31**	**LOAEL HQ = 5.6**	**LOAEL HQ = 5.6**	LOAEL HQ < 1	**LOAEL HQ = 5.4**	LOAEL HQ < 1	**LOAEL HQ = 18**
	Raccoon	---	---	---	---	---	---	---	---	---	---
	Red-Winged Blackbird	---	---	---	---	---	---	---	---	---	---
	Song Sparrow	---	---	---	---	---	---	---	---	---	---
Lead	American Robin	---	---	---	---	---	---	---	---	---	---
	Belted Kingfisher	---	---	---	---	---	---	---	---	---	---
	Coyote	---	---	---	---	---	---	---	---	---	---
	Deer Mouse	---	---	---	---	---	---	---	---	---	---
	Eastern Cottontail	---	---	---	---	---	---	---	---	---	---
	Mallard	---	---	---	---	---	---	---	---	---	---
	Meadow Vole	---	---	---	---	---	---	---	---	---	---
	Mink	---	---	---	---	---	---	---	---	---	---
	Mule Deer	---	---	---	---	---	---	---	---	---	---
	Northern Bobwhite	---	---	---	---	---	---	---	---	---	---
	Northern Harrier	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 1.3 GM NOAEL HQ < 1**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 5.8 GM NOAEL HQ = 1.0**	LOAEL HQ < 1	**LOAEL HQ = 1.1 GM NOAEL HQ < 1**
	Raccoon	---	---	---	---	---	---	---	---	---	---
	Red-Winged Blackbird	---	---	---	---	---	---	---	---	---	---
	Song Sparrow	---	---	---	---	---	---	---	---	---	---

TABLE 6-3
Riparian Risk Characterization Summary

ECOPC	Receptor	DS-7	ES-3	ES-4	HS-3	HS-CC1	HS-CC2	LP-PD	LS	LSm	LSS
Manganese	American Robin	---	---	---	---	---	---	---	---	---	---
	Belted Kingfisher	---	---	---	---	---	---	---	---	---	---
	Coyote	---	---	---	---	---	---	---	---	---	---
	Deer Mouse	---	---	---	---	---	---	---	---	---	---
	Eastern Cottontail	---	---	---	---	---	---	---	---	---	---
	Mallard	---	---	---	---	---	---	---	---	---	---
	Meadow Vole	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 1.5**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 1.4**
	Mink	---	---	---	---	---	---	---	---	---	---
	Mule Deer	---	---	---	---	---	---	---	---	---	---
	Northern Bobwhite	---	---	---	---	---	---	---	---	---	---
	Northern Harrier	---	---	---	---	---	---	---	---	---	---
	Raccoon	---	---	---	---	---	---	---	---	---	---
	Red-Winged Blackbird	---	---	---	---	---	---	---	---	---	---
	Song Sparrow	---	---	---	---	---	---	---	---	---	---
Molybdenum	American Robin	---	---	---	---	---	---	---	---	---	---
	Belted Kingfisher	---	---	---	---	---	---	---	---	---	---
	Coyote	---	---	---	---	---	---	---	---	---	---
	Deer Mouse	---	---	---	---	---	---	---	---	---	---
	Eastern Cottontail	---	---	---	---	---	---	---	---	---	---
	Mallard	---	---	---	---	---	---	---	---	---	---
	Meadow Vole	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 1.4**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1
	Mink	---	---	---	---	---	---	---	---	---	---
	Mule Deer	---	---	---	---	---	---	---	---	---	---
	Northern Bobwhite	---	---	---	---	---	---	---	---	---	---
	Northern Harrier	---	---	---	---	---	---	---	---	---	---
	Raccoon	---	---	---	---	---	---	---	---	---	---
	Red-Winged Blackbird	---	---	---	---	---	---	---	---	---	---
	Song Sparrow	---	---	---	---	---	---	---	---	---	---
Selenium	American Robin	**LOAEL HQ = 36 GM NOAEL HQ = 21**	LOAEL HQ < 1	**LOAEL HQ = 98 GM NOAEL HQ = 59**	**LOAEL HQ = 2.1 GM NOAEL HQ = 1.2**	**LOAEL HQ = 1.3 GM NOAEL HQ < 1**	**LOAEL HQ = 1.9 GM NOAEL HQ = 1.1**	**LOAEL HQ = 15 GM NOAEL HQ = 8.9**	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 1.8 GM NOAEL HQ = 1.0**
	Belted Kingfisher	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 3.6 GM NOAEL HQ = 2.1**	**LOAEL HQ = 3.6 GM NOAEL HQ = 2.1**	**LOAEL HQ = 3.5 GM NOAEL HQ = 2.1**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 2.6 GM NOAEL HQ = 1.5**
	Coyote	**LOAEL HQ = 9.8 GM NOAEL HQ = 3.2**	LOAEL HQ < 1	**LOAEL HQ = 24 GM NOAEL HQ = 8.0**	**LOAEL HQ = 2.3 GM NOAEL HQ < 1**	**LOAEL HQ = 1.1 GM NOAEL HQ < 1**	**LOAEL HQ = 1.1 GM NOAEL HQ < 1**	**LOAEL HQ = 3.2 GM NOAEL HQ = 1.0**	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 1.8 GM NOAEL HQ < 1**
	Deer Mouse	**LOAEL HQ = 89 GM NOAEL HQ = 29**	**LOAEL HQ = 1.4 GM NOAEL HQ < 1**	**LOAEL HQ = 250 GM NOAEL HQ = 81**	**LOAEL HQ = 4.8 GM NOAEL HQ = 1.6**	**LOAEL HQ = 3.0 GM NOAEL HQ = 1.0**	**LOAEL HQ = 4.6 GM NOAEL HQ = 1.5**	**LOAEL HQ = 40 GM NOAEL HQ = 13**	**LOAEL HQ = 1.5 GM NOAEL HQ < 1**	LOAEL HQ < 1	**LOAEL HQ = 4.4 GM NOAEL HQ = 1.4**
	Eastern Cottontail	**LOAEL HQ = 18 GM NOAEL HQ = 5.8**	LOAEL HQ < 1	**LOAEL HQ = 64 GM NOAEL HQ = 21**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 18 GM NOAEL HQ = 5.8**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1
	Mallard	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 4.8 GM NOAEL HQ = 2.9**	**LOAEL HQ = 4.8 GM NOAEL HQ = 2.9**	**LOAEL HQ = 4.3 GM NOAEL HQ = 2.5**	**LOAEL HQ = 3.3 GM NOAEL HQ = 1.9**	**LOAEL HQ = 1.5 GM NOAEL HQ < 1**	LOAEL HQ < 1	**LOAEL HQ = 2.6 GM NOAEL HQ = 1.5**
	Meadow Vole	**LOAEL HQ = 83 GM NOAEL HQ = 27**	LOAEL HQ < 1	**LOAEL HQ = 320 GM NOAEL HQ = 108**	**LOAEL HQ = 1.1 GM NOAEL HQ < 1**	**LOAEL HQ = 1.6 GM NOAEL HQ < 1**	**LOAEL HQ = 1.1 GM NOAEL HQ < 1**	**LOAEL HQ = 88 GM NOAEL HQ = 29**	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 2.4 GM NOAEL HQ < 1**
	Mink	**LOAEL HQ = 5.6 GM NOAEL HQ = 1.8**	LOAEL HQ < 1	**LOAEL HQ = 5.3 GM NOAEL HQ = 1.7**	**LOAEL HQ = 6.8 GM NOAEL HQ = 2.2**	**LOAEL HQ = 6.9 GM NOAEL HQ = 2.3**	**LOAEL HQ = 6.5 GM NOAEL HQ = 2.1**	**LOAEL HQ = 1.4 GM NOAEL HQ < 1**	**LOAEL HQ = 1.5 GM NOAEL HQ < 1**	**LOAEL HQ = 1.6 GM NOAEL HQ < 1**	**LOAEL HQ = 5.0 GM NOAEL HQ = 1.6**
	Mule Deer	**LOAEL HQ = 11 GM NOAEL HQ = 3.7**	LOAEL HQ < 1	**LOAEL HQ = 41 GM NOAEL HQ = 13**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 12 GM NOAEL HQ = 3.8**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1
	Northern Bobwhite	**LOAEL HQ = 12 GM NOAEL HQ = 7.3**	LOAEL HQ < 1	**LOAEL HQ = 41 GM NOAEL HQ = 24**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 9.7 GM NOAEL HQ = 5.8**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1
	Northern Harrier	**LOAEL HQ = 9.2 GM NOAEL HQ = 5.5**	LOAEL HQ < 1	**LOAEL HQ = 27 GM NOAEL HQ = 16**	**LOAEL HQ = 2.8 GM NOAEL HQ < 1**	**LOAEL HQ = 1.3 GM NOAEL HQ < 1**	**LOAEL HQ = 1.3 GM NOAEL HQ < 1**	**LOAEL HQ = 3.5 GM NOAEL HQ = 2.1**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1
	Raccoon	**LOAEL HQ = 5.4 GM NOAEL HQ = 1.7**	LOAEL HQ < 1	**LOAEL HQ = 10 GM NOAEL HQ = 3.3**	**LOAEL HQ = 3.1 GM NOAEL HQ = 1.0**	**LOAEL HQ = 3.1 GM NOAEL HQ = 1.0**	**LOAEL HQ = 2.4 GM NOAEL HQ < 1**	**LOAEL HQ = 4.1 GM NOAEL HQ = 1.4**	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 1.9 GM NOAEL HQ < 1**
	Red-Winged Blackbird	**LOAEL HQ = 22 GM NOAEL HQ = 13**	LOAEL HQ < 1	**LOAEL HQ = 70 GM NOAEL HQ = 42**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 15 GM NOAEL HQ = 9.2**	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 1.9 GM NOAEL HQ < 1**
	Song Sparrow	**LOAEL HQ = 26 GM NOAEL HQ = 1.5**	LOAEL HQ < 1	**LOAEL HQ = 98 GM NOAEL HQ = 59**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 27 GM NOAEL HQ = 16**	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 1.9 GM NOAEL HQ < 1**

TABLE 6-3
Riparian Risk Characterization Summary

ECOPC	Receptor	DS-7	ES-3	ES-4	HS-3	HS-CC1	HS-CC2	LP-PD	LS	LSm	LSS
Vanadium	American Robin	**LOAEL HQ = 2.9 GM NOAEL HQ = 1.0**	**LOAEL HQ = 2.9 GM NOAEL HQ < 1**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1
	Belted Kingfisher	---	---	---	---	---	---	---	---	---	---
	Coyote	---	---	---	---	---	---	---	---	---	---
	Deer Mouse	---	---	---	---	---	---	---	---	---	---
	Eastern Cottontail	---	---	---	---	---	---	---	---	---	---
	Mallard	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 2.8 GM NOAEL HQ < 1**	**LOAEL HQ = 2.9 GM NOAEL HQ = 1.0**	**LOAEL HQ = 2.2 GM NOAEL HQ < 1**	**LOAEL HQ = 1.7 GM NOAEL HQ < 1**
	Meadow Vole	---	---	---	---	---	---	---	---	---	---
	Mink	---	---	---	---	---	---	---	---	---	---
	Mule Deer	---	---	---	---	---	---	---	---	---	---
	Northern Bobwhite	**LOAEL HQ = 1.4 GM NOAEL HQ < 1**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1
	Northern Harrier	---	---	---	---	---	---	---	---	---	---
	Raccoon	---	---	---	---	---	---	---	---	---	---
	Red-Winged Blackbird	**LOAEL HQ = 2.5 GM NOAEL HQ < 1**	**LOAEL HQ = 1.4 GM NOAEL HQ < 1**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 1.0 GM NOAEL HQ < 1**
	Song Sparrow	**LOAEL HQ = 3.3 GM NOAEL HQ = 1.1**	**LOAEL HQ = 1.1 GM NOAEL HQ < 1**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 1.5 GM NOAEL HQ < 1**
Zinc	American Robin	---	---	---	---	---	---	---	---	---	---
	Belted Kingfisher	---	---	---	---	---	---	---	---	---	---
	Coyote	---	---	---	---	---	---	---	---	---	---
	Deer Mouse	---	---	---	---	---	---	---	---	---	---
	Eastern Cottontail	---	---	---	---	---	---	---	---	---	---
	Mallard	---	---	---	---	---	---	---	---	---	---
	Meadow Vole	---	---	---	---	---	---	---	---	---	---
	Mink	---	---	---	---	---	---	---	---	---	---
	Mule Deer	---	---	---	---	---	---	---	---	---	---
	Northern Bobwhite	---	---	---	---	---	---	---	---	---	---
	Northern Harrier	**LOAEL HQ = 1.6 REV LOAEL HQ = 1.3**	**LOAEL HQ = 1.4 REV LOAEL HQ = 1.1**	**LOAEL HQ = 1.1 REV LOAEL HQ < 1**	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	LOAEL HQ < 1	**LOAEL HQ = 1.6 REV LOAEL HQ = 1.4**	**LOAEL HQ = 2.4 REV LOAEL HQ = 2.0**
	Raccoon	---	---	---	---	---	---	---	---	---	---
	Red-Winged Blackbird	---	---	---	---	---	---	---	---	---	---
	Song Sparrow	---	---	---	---	---	---	---	---	---	---

Notes:

--- = Not an ECOC

ECOPC - Ecological Chemical of Potential Concern, ECOC - Ecological Chemical of Concern, LOAEL - Lowest Observed Adverse Effects Level, NOAEL - No-Observed Adverse Effects Levels, HQ - Hazard Quotient

The RI COPC was not idenitified as an ECOPC for the receptor.

Tier 3 - The Tier 2 HQ calculated using the lowest LOAEL TRV was greater than 1.0 and potential risks are discussed in more detail in the Tier 3 Risk Characterization.

EcoSSL - Ecological Soil Screening Level, RI COPC - Remedial Investigation Chemical of Potential Concern, TRV - Toxicity Reference Value

ALT LOAEL - Alternative LOAEL

GM NOAEL - Geometric mean of the EcoSSL NOAEL for growth and reproduction. Discussed further for each ECOC in Section 4.

REV LOAEL - Revised LOAEL for zinc.