



United States
Department of
Agriculture

Forest
Service

June 2008



Final Environmental Impact Statement

Idaho Cobalt Project

Salmon-Cobalt Ranger District, Salmon-Challis National Forest

Lemhi County, Idaho



JUNE 2008

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

June 12, 2008

Final Environmental Impact Statement for the Idaho Cobalt Project

Dear Reader:

This document is the Final Environmental Impact Statement (FEIS) prepared by the Forest Service for the Idaho Cobalt Project on the Salmon-Cobalt Ranger District of the Salmon-Challis National Forest (SCNF). This FEIS is accompanied by a Record of Decision (ROD) that describes the SCNF's decision to allow construction of a mine under certain conditions. The Idaho Cobalt Project would mine cobalt, copper and gold from National Forest Lands; these metals are used for a variety of purposes ranging from industrial to medical purposes.

This FEIS is the result of seven years of analysis, conducted with agency, Tribal and public participation. To date, approximately 175 individuals, groups, organizations, Tribal entities, and agencies have provided comments regarding project related concerns and issues. This input has allowed the SCNF to develop a FEIS that meets the purposes of the regulations and addresses the publics' concerns and issues expressed in comments.

The SCNF's decision as described in the ROD is subject to appeal pursuant to Forest Service regulations at 36 CFR 215. Appeals must meet the content requirements of 36 CFR 215.14. Only individuals or organizations who submitted comments or otherwise expressed interest in the project during the comment period may appeal. Appeals must be postmarked or received by the Appeal Deciding Officer within 45 days of the publication of notice of the ROD in The Recorder Herald Newspaper of Salmon, ID.

For additional information on the mining, operation, and closure plan, this Environmental Impact Statement, or the ROD please contact:

Kimberly D. Nelson, District Ranger
Salmon-Cobalt Ranger District
311 McPherson St.
Salmon, ID 83467

Phone: 208-756-5247

Sincerely,

/s/Ray Henderson
RAY HENDERSON
Project Coordinator

**Idaho Cobalt Project
Final Environmental Impact Statement
Lemhi County, Idaho**

Lead Agency: **USDA Forest Service**

Cooperating Agencies: **US Environmental Protection Agency
Idaho Department of Environmental Quality**

Responsible Official: **William A. Wood
Forest Supervisor
Salmon-Challis National Forest
1206 South Challis St.
Salmon, Idaho 83467**

Abstract: The Idaho Cobalt Project Final Environmental Impact Statement describes the land, people, and resources potentially affected by the proposed Idaho Cobalt Project underground cobalt mine and associated facilities. The lead agency's responsibilities consist of review and analysis of the impacts of the proposed action and reasonable alternatives, and review of public comment. The U.S. Forest Service Salmon-Challis National Forest and the U.S. Environmental Protection Agency will use information presented in this Environmental Impact Statement (EIS) to determine whether or not to approve the Plan of Operations (POO) and National Pollution Discharge Elimination System (NPDES) permit for the Idaho Cobalt Project. The proponent's proposed project would consist of two underground mines, a mill, a tailings and waste rock disposal facility, access roads and utility corridors. Five alternatives, including No Action, are analyzed. The preferred alternative is the agency Alternative IV. The proposed mine is within the area of ongoing CERCLA remediation and restoration activities directed at historic mining activities.

Summary

The Salmon-Challis National Forest (SCNF) is proposing to approve a Plan of Operations for the Idaho Cobalt Project that would allow the development of two underground mines, a waste disposal site and associated facilities on National Forest Land west of Salmon, Idaho. The area affected by the proposed mineral development project would consist of surface disturbance on approximately 111 to 324 acres (depending on alternative selected) located in the Panther Creek drainage on the Salmon - Cobalt Ranger District, Salmon-Challis National Forest, in or adjacent to Sections 8, 9, 15, 16, 17, 20, 21, and 22, Township 21 North, Range 18 East (**Figure 1-1**). The Formation Capital Corporation (FCC) property is composed of several mineral deposits acquired by locating and filing mining claims within the Salmon-Cobalt Ranger District of the Salmon-Challis National Forest. The property consists of 146 unpatented mining claims for a total of 2,529 acres of mineral rights. This action is needed in response to submittal of the FCC Plan of Operation for the Idaho Cobalt Project (ICP), which describes the company's intent to develop a cobalt mine on unpatented mineral claims held by FCC. The SCNF is required to evaluate and process the proposed Plan under the authority of the U.S. Mining Law and in accordance with 36 CFR 228A as further defined by law, regulation, Agency policy and plans.

The SCNF received the initial proposed Plan of Operations in January 2001. An information Scoping packet was distributed to interested parties on July 10, 2001 with a request for written comments. A public meeting was held by the SCNF on July 20, 2001, in Salmon, Idaho, and a comment form was provided for those wishing to provide written comments. Subsequent to the July 20, 2001 public meeting, a Notice of Intent (NOI) to prepare an EIS for the proposed mining project was published by the Forest Service in the Federal Register on September 10, 2001. Public Scoping meetings were held by the SCNF in Challis, Idaho, on October 10, 2001, and Salmon, Idaho, on October 11, 2001. On February 4, 2005 FCC submitted a revised proposed Plan of Operations including supporting technical documents. On April 5, 2006 and June 6, 2006, FCC submitted additional revisions to the proposed Plan of Operations. On May 25, 2006 FCC submitted an application to the US Environmental Protection Agency (EPA) Region 10 to discharge wastewater to Big Deer Creek under the National Pollution Discharge Elimination System (NPDES) program. EPA deemed the application complete on July 14, 2006. EPA is a cooperating agency with the Forest Service in the development of the ICP EIS. A revised NOI was published in the Federal Register on November 1, 2006. A Draft Environmental Impact Statement (DEIS) was noticed in the Federal Register on February 23, 2007. A public comment period, extended at public request, ran from February 23 through May 24, 2007.

During the public comment period, 173 comments were received on the DEIS. Analysis of the public comments resulted in changes to this FEIS. Responses to public comments are contained in Appendix D of this FEIS.

Alternatives Analyzed - These issues identified in Scoping led the agency to develop alternatives to the proposed action. The following alternatives are analyzed in this EIS:

- Alternative I – No Action.
- Alternative II – Formation Capital Corporation has presented a proposal to develop two underground mines, construct a mill that utilizes conventional flotation technology to produce a cobalt, copper and gold concentrate, dispose of mill tailings in a dry stack waste storage facility, utilize paste backfill to return a portion of the tailings underground as part of the mining process and collection and treatment of excess mine water with a reverse osmosis system and discharge to Big Deer Creek under a NPDES permit. The water discharge pipeline would directly affect a small area (0.1 acres) of jurisdictional wetlands and require a 404 permit from the US Army Corps of Engineers.
- Alternative III – Alternative III includes agency modifications to the company's proposal to reduce potential impacts to resources including surface water, groundwater, wetlands, public safety and native vegetation. The proposed modifications include relocation of the tailings and waste rock storage facility to avoid isolated wetlands, utilization of a land application water treatment and disposal system as an alternative to reverse osmosis water treatment, addition of amendments to waste backfilled into the mine to reduce risks to groundwater and surface water quality, long-term mine dewatering rather than groundwater capture to reduce impacts to groundwater and surface water quality, changes to reclamation techniques to facilitate recovery of native plant communities, improvements to waste storage facilities, upgrades to access roads to improve safety and expanded water and geochemical monitoring to provide a better understanding of operational and post-operational water quality impacts.

- Alternative IV – Alternative IV includes agency modifications to the proposed Plan to reduce resource impacts to surface water, groundwater, wetlands and native vegetation. Alternative IV modifications include reducing the size of the tailings disposal site to match existing ore reserves and avoid direct impacts to isolated wetlands, modification of the groundwater capture system to ensure adequate post-closure groundwater capture, modification of the proposed water treatment system to reduce the volume of water treatment waste products while meeting NPDES permit requirements for the discharge to Big Deer Creek, addition of amendments to mine waste backfill to improve long-term geochemical stability and re-routing of the water discharge pipeline to avoid impacts to a cultural site.
- Alternative V – Alternative V is similar to Alternative IV but includes the additional modification to reduce infrastructure requirements by utilizing the existing Blackbird Mine water treatment facility site for Idaho Cobalt water treatment facilities and discharge under NPDES authority into Blackbird Creek.

Table S-1 summarizes the major components of each alternative. The effects analysis presented in Chapter 4 identifies a number of differences between the alternatives. Major environmental effects of the alternatives are summarized in **Table S-2**.

Preferred Alternative – The preferred alternative is the alternative that the agency analysis identifies as best meeting the purpose and need of the proposed action while minimizing impacts to human health and the environment. The agencies have identified Alternative IV as the preferred alternative for the ICP. If this preferred alternative is selected in the Record of Decision (ROD), FCC would be required to modify their Plan of Operations to include mitigation and monitoring components outlined in the preferred alternative. Modifications to the Plan of Operations would include submittal of detailed plans and designs for a number of project components including the water treatment system, the groundwater capture system, smaller tailings and waste rock storage facility (TWSF) including commingled tailings disposal, waste (slash) amendment and water monitoring. These and other design details and operational system plans would require Forest Service approval prior to implementation. Alternative IV provides the best combination of operational components and reduces risks to the environment by limiting the size of the tailings and waste rock storage facility (TWSF), reducing the wastes produced in the water treatment system that would require disposal, increasing the amount of road reclamation, providing for amendment of backfill material to control risk of metals leaching following closure, providing additional groundwater capture capacity, if necessary, to improve chances of collecting the post-closure entire chemical load from the mines and improvements to monitoring plans. These key components of the preferred alternative are included as design components or modifications and mitigation measures. An important agency objective addressed in the preferred alternative is the modification and clarification of the monitoring and reporting requirements that will allow the Forest Service to provide effective oversight during operations and reclamation. The ICP would also need to obtain approval for access across private land, use and maintenance of existing private roads and use and possible modification of a section of the powerline crossing the private lands to reach the ICP.

Alternative IV includes amendment of backfilled materials to minimize risk of metals leaching from the mine areas, modifies the water treatment system to reduce the water treatment waste stream requiring disposal, provides a backup groundwater collection system to ensure that post-closure groundwater potentially affected by the underground mining can be captured and treated if necessary. These modifications reduce the risk that metals from the

TABLE S-1. IDAHO COBALT PROJECT – ALTERNATIVE COMPARISON

Issue	Alternative II FCC's Proposal	Alternative III Relocation of TWSF, Perpetual Mine Dewatering and Land Application Water Discharge	Alternative IV Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream, Surface Discharge to Big Deer Creek	Alternative V Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant, Surface Discharge to Blackbird Creek
Total Disturbed Acreage	130 acres	324 acres	115 acres	111 acres
Transportation	2.6 miles new road; 12.7 miles of site road upgrade; 10.9 miles of access road upgrade; 4.5 miles net total road reduction.	5.7 miles new road; 7.5 miles site road upgrade; 40 miles access road upgrade; 7.5 miles net total road reduction.	4.1 miles new road; 11.3 miles of site road upgrade; 40 miles of access road upgrade; 7.5 miles net total road reduction.	2.6 miles new road; 11.9 miles of site road upgrade; 40 miles of access road upgrade; 7.5 miles net total road reduction.
Tailings and Waste rock Disposal	55 acre, 2.6 Mcy (million cubic yards) TWSF; 3 ft. thick soil cap.	53 acre, 2.6 Mcy TWSF that avoids isolated wetlands; 4 ft. thick soil cap to protect liner.	36 acre, 1.7 Mcy TWSF that avoids isolated wetlands by moving site to north; 4 ft. thick soil cap to protect liner.	36 acre, 1.7 Mcy TWSF that avoids isolated wetlands by moving site to north; 4 ft. thick soil cap to protect liner.
Water Treatment and Disposal	Reverse osmosis water treatment and discharge to Big Deer Creek; NPDES permit.	Land application water treatment on 175 acre LAT site in Big Flat drainage; NPDES permit would be required.	Water Treatment using precipitation and ion exchange polishing and Direct Discharge to Big Deer Creek Under NPDES Permit, which includes a mixing zone for sulfate.	Advanced Water Treatment at Existing Blackbird Treatment Plant Site and Direct Discharge to Blackbird Creek Under NPDES Permit.
Reclamation	Revegetation using non-native species and natural reseeding of trees & shrubs.	Revegetation using native species and planting trees and shrubs.	Revegetation using native species and planting trees and shrubs.	Revegetation using native species and planting trees and shrubs.
Tailings Placement Underground	Paste tailings placed underground as needed for fill; portions of tailings cemented for mining.	Paste tailings placed underground as needed for fill; all backfill tailings mixed with limestone to control post-closure pH; amend waste rock (slash) backfill for pH control.	Paste tailings placed underground as needed for fill; all backfill tailings and waste rock mixed with amendment to control post-closure pH.	Paste tailings placed underground as needed for fill; all backfill tailings mixed with limestone to control post-closure pH; amend waste rock (slash) backfill for pH control.
Post-Mining Water Capture	Groundwater downgradient of mines captured by bedrock capture wells, if necessary.	Groundwater captured from lower level of mines to improve capture efficiency.	Bedrock well capture system supplemented by alluvial capture system in lower Bucktail Creek drainage to improve capture efficiency.	Bedrock well capture system supplemented by alluvial capture system in lower Bucktail Creek drainage to improve capture efficiency.
Waste Management	Waste rock and tailings would be separated in TWSF.	Waste rock and tailings would be commingled in TWSF disposal to reduce oxygen to waste rock.	Waste rock and tailings would be commingled in TWSF disposal to reduce oxygen to waste rock.	Waste rock and tailings would be commingled in TWSF disposal to reduce oxygen to waste rock.
Water Monitoring	Monitor mine inflow rates and chemistry; install additional wells peripheral to mines and monitor drawdown during mine dewatering for purpose of confirming groundwater assumptions.	As in Alternative II plus additional groundwater monitoring wells, monitoring of mine water quality and quantity, and coordination of ICP with BMSG monitoring.	Same as Alt III; plus install wells in Bucktail Creek alluvium to determine alluvial groundwater capture requirements.	Same as Alt III; plus install wells in Bucktail Creek alluvium to determine alluvial groundwater capture requirements.

TABLE S-2. IDAHO COBALT PROJECT – EFFECTS COMPARISON

Issue	Alternative II FCC's Proposal	Alternative III Relocation of TWSF, Perpetual Mine Dewatering and Land Application Water Discharge	Alternative IV Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream, Surface Discharge to Big Deer Creek	Alternative V Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant, Surface Discharge to Blackbird Creek
Disturbed Acreage	Intermediate disturbed area.	Substantially greater disturbed area.	Less disturbed area.	Least disturbed area.
Transportation	Road improvements to improve trafficability and sediment delivery to streams.	Proposed road mitigation would increase safety on access route, reduce sediment delivery to streams and reduce risk of water quality effects from a spill of a hazardous substance.	Proposed road mitigation would increase safety on access route, reduce sediment delivery to streams and reduce risk of water quality effects from a spill of a hazardous substance.	Proposed road mitigation would increase safety on access route, reduce sediment delivery to streams and reduce risk of water quality effects from a spill of a hazardous substance.
Tailings and Waste rock Disposal	TWSF would eliminate 0.22 acres of non-jurisdictional wetland and provide a similar area of replacement wetlands.	Alternative TWSF site would avoid non-jurisdictional wetlands.	Initial reduced TWSF footprint would mitigate impacts to non-jurisdictional wetlands; potential future expansion would impact non-jurisdictional wetlands.	Initial reduced TWSF footprint would mitigate impacts to non-jurisdictional wetlands; potential future expansion would impact non-jurisdictional wetlands.
Water Treatment and Disposal	Reverse osmosis (contingency) would create large waste stream requiring disposal; if post-closure treatment were required off-site disposal could require two trucks per week for RO waste.	LAT would have largest surface disturbance; sulfate may locally exceed groundwater standards in Big Flat drainage.	Water Treatment would have smaller waste stream and lower costs than reverse osmosis, but would not remove sulfate.	Utilizing Blackbird WTP site would minimize infrastructure, particularly if post-closure water treatment were required; requires agreement with BMSG/Noranda and modification of CERCLA water treatment system.
Reclamation	Use of non-native species could preclude or delay recovery of native plant communities.	Use of native species meets Forest objectives and National USFS direction.	Use of native species meets Forest objectives and National USFS direction.	Use of native species meets Forest objectives and National USFS direction.
Underground Backfill Amendment	Paste tailings placed underground in the Ram as needed for fill; portions of tailings cemented for mining.	Paste tailings placed underground as needed for fill; all backfill tailings mixed with limestone to control post-closure pH; amend waste rock (slash) in both Ram and Sunshine backfill for pH control.	Paste tailings placed underground as needed for fill; all backfill tailings mixed with limestone to control post-closure pH; amend waste rock (slash) in both Ram and Sunshine backfill for pH control.	Paste tailings placed underground as needed for fill; all backfill tailings mixed with limestone to control post-closure pH; amend waste rock (slash) in both Ram and Sunshine backfill for pH control.
Post-Mining Water Capture	Bedrock capture wells unlikely to be effective at capturing required volume of groundwater necessary for metals load removal.	Mine dewatering effective, but requires essentially perpetual capture and treatment.	Alluvial groundwater collection backup system effective, but may increase amount of water to be treated; increased disturbance.	Alluvial groundwater collection backup system effective, but may increase amount of water to be treated; increased disturbance.
Water Monitoring	ICP monitoring plan addresses surface and groundwater.	Expanded monitoring system allows better understanding of potential impacts; increased information for making closure decisions.	Expanded monitoring system allows better understanding of potential impacts; increased information for making closure decisions.	Expanded monitoring system allows better understanding of potential impacts; increased information for making closure decisions.

ICP could adversely affect the ongoing Blackbird cleanup efforts. Other mitigation measures such as road improvements to reduce sediment yield and appropriate disposal of existing waste materials at the Sunshine portal would result in decreased environmental impact. The road improvements and enhanced emergency management requirements are intended to improve public and mine employee safety. Requirements in Alternative IV for detailed plans for winter tailings disposal, pond liner protection and inclusion of spillways on process water ponds will reduce risk of operational problems that could result in effects to water or other resources or adversely affect the Blackbird Mine cleanup effort.

Use of native vegetation in reclamation, addition of a weed control plan and application of Forest guidelines in soil disturbance and vegetation clearing are intended to reduce the length of time that is required to achieve reclamation goals. All of these components that are included in the agencies' preferred alternative are intended to reduce impacts to the environment and contribute to the selection of Alternative IV as the preferred alternative. The modified TWSF footprint in Alternative IV would limit the potential expansion and increase the costs of TWSF construction if additional ore reserves were identified.

Environmentally Preferred Alternative – The Forest Service is required to identify the environmentally preferred alternative in the Record of Decision. The environmentally preferred alternative is the alternative that causes the least damage to the biological and physical environment and best protects, preserves and enhances historic, cultural and natural resources. Alternative V is identified as the environmentally preferred alternative because it would require the smallest physical disturbance, would minimize the footprint and infrastructure requirements if post-closure water treatment were required, would minimize amount of road required in roadless area and would result in water quality improvement in Blackbird Creek by discharging an increased amount of treated water to the Blackbird drainage. However, the agencies cannot require the ICP to obtain an agreement with another private party to operate a water treatment plant on property owned by Noranda.

Financial Assurance – Prior to approval of a Plan of Operations, the ICP operator will submit a financial assurance, such as a bond, that will cover the cost of reclamation if the company were to default on their obligations. The Forest Service has prepared a financial assurance estimate in accordance with Forest Service guidance, which includes regrading and recontouring of surface disturbances, removal of surface facilities, revegetation and costs for long-term water treatment. The amount of the financial assurance will be calculated to reflect the selected alternative. The financial assurance will be subject to an annual review and adjustment throughout the life of the project to reflect changed circumstances.

TABLE OF CONTENTS

LIST OF TABLES.....xxiii

LIST OF FIGURESxxvii

LIST OF APPENDICESxxix

CHAPTER 1. PURPOSE AND NEED 1-1

 INTRODUCTION..... 1-1

 THE PROPOSED ACTION 1-3

 Purpose and Need for Action 1-5

 Decisions to be Made..... 1-6

 MANAGEMENT DIRECTION..... 1-7

 Salmon National Forest Land and Resource Management Plan 1-7

 Project Record 1-7

 Public Involvement 1-7

 Availability of the Draft EIS..... 1-8

 Issues..... 1-8

 LEGAL REQUIREMENTS 1-11

 The Endangered Species Act (ESA) of 1973, as amended 1-14

 The National Environmental Policy Act of 1969 (NEPA)
 (PL 91-190) 1-15

 The Migratory Bird Treaty Act of 1918 1-15

 The Federal Water Pollution Control Act of 1972 (PL 92-500) as
 amended in 1977 (PL 95-217) and 1987 (PL 100-4), also
 known as the Federal Clean Water Act (CWA) 1-15

 The Clean Air Act, as amended in 1990..... 1-15

 Federal Noxious Weed Act of 1974..... 1-16

 The Preservation of American Antiquities Act of 1906 1-16

 The National Historic Preservation Act..... 1-16

 Consumers, Civil Rights, Minorities, and Women 1-16

 Environmental Justice 1-16

Salmon-Challis National Forest Responsibilities to Federally Recognized Tribes	1-16
Financial Assurance.....	1-17
OTHER AGENCIES HAVING PERMIT OR REVIEW AUTHORITY	1-17
Idaho State Historic Preservation Office (SHPO).....	1-17
U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Association (NOAA) Fisheries Service	1-18
U.S. Army Corps of Engineers (COE).....	1-18
U.S. Environmental Protection Agency (EPA).....	1-18
Idaho Department of Water Resources (IDWR).....	1-18
Idaho Department of Environmental Quality (IDEQ)	1-19
Idaho Department of Health and Welfare.....	1-19
Lemhi County.....	1-19
CHAPTER 2. ALTERNATIVES.....	2-1
INTRODUCTION.....	2-1
ALTERNATIVES CONSIDERED IN DETAIL	2-1
ALTERNATIVE I - NO ACTION.....	2-1
ALTERNATIVE II - FORMATION CAPITAL CORPORATION'S PROPOSED PLAN OF OPERATIONS.....	2-2
Project Development Schedule.....	2-4
Transportation.....	2-4
Transportation Plan	2-7
Site Roads.....	2-7
Primary Roads.....	2-7
Secondary Roads.....	2-7
Tertiary Roads.....	2-7
Transportation of Personnel and Supplies.....	2-8
Mining Operation.....	2-8
Ore Reserves/Production Schedule	2-8
Mining Method.....	2-9
Tram Operation	2-9

Mine Workings.....	2-11
Ram Portal Platform	2-11
Sunshine Portal Platform.....	2-11
Backfilling	2-11
Mine Dewatering.....	2-13
Mine Equipment and Facilities.....	2-13
Waste Rock Characterization	2-14
Tailings and Waste Rock Storage Facility	2-14
Milling Operations	2-18
Mill Location and Description.....	2-18
Ore Stockpile	2-18
Milling Production Rate.....	2-20
Materials and Supplies	2-20
Concentrate Storage and Shipping.....	2-20
Tailings Handling	2-20
Tailings Characterization	2-20
Tailings Disposal	2-21
Water Treatment Residuals Storage	2-21
Tailings Disposal Quality Assurance/Quality Control.....	2-21
Water Resources	2-22
Water Management	2-22
Water Treatment	2-26
Storm Water Management Plan	2-29
Spill Control	2-30
Water Rights.....	2-30
Water Resource Monitoring.....	2-30
Ancillary Facilities	2-31
Support Facilities	2-31
Power and Fuel	2-31
Borrow Areas.....	2-31
Work Force and Work Schedule	2-31

Interim Shutdown	2-31
Reclamation	2-32
Facility Reclamation	2-33
Soil Salvage	2-34
Reclamation Recontouring	2-35
Replacement of Growth Medium	2-35
Re-Vegetation	2-35
Water Management at Closure.....	2-35
Water Management Pond.....	2-36
Post-Closure Monitoring	2-36
Financial Assurance	2-36
ALTERNATIVE III - RELOCATION OF TWSF, PERPETUAL MINE	
DEWATERING, AND LAND APPLICATION WATER DISCHARGE	2-36
Modifications to ICP Plan to Address Specific Resource	
Concerns	2-38
Geotechnical Considerations.....	2-38
Waste Storage Facility.....	2-39
Water Management and Treatment.....	2-39
Water Monitoring	2-41
Road Upgrades	2-41
Other Mitigation	2-41
ALTERNATIVE IV - REDUCED SIZE OF TWSF, MODIFIED WATER	
TREATMENT TO REDUCE WASTE STREAM, SURFACE	
DISCHARGE TO BIG DEER CREEK AND ADDITIONAL	
GROUNDWATER CAPTURE IN LOWER BUCKTAIL CREEK.....	2-42
Modifications Included in Alternative IV	2-44
Waste Storage Facility.....	2-44
Geotechnical Considerations.....	2-44
Water Management and Treatment.....	2-44
Alternative IV Modifications in Common with Alternative III.....	2-49
Comingle Tailings and Waste in TWSF	2-49

Underground Waste Rock Amendment.....	2-49
TWSF Closure Cap	2-49
Water Monitoring	2-49
Road Upgrades	2-49
Other Mitigation	2-49
ALTERNATIVE V - LOWER BUCKTAIL GROUNDWATER CAPTURE, WATER TREATMENT AT SITE OF BLACKBIRD TREATMENT PLANT AND SURFACE DISCHARGE TO BLACKBIRD CREEK	2-50
Modifications Included in Alternative V	2-50
Waste Storage Facility.....	2-50
Geotechnical Considerations.....	2-50
Water Management and Treatment.....	2-52
Road Upgrades	2-52
Water Monitoring	2-52
Other Mitigation	2-52
OPERATIONAL AND DESIGN COMPONENTS, MITIGATION MEASURES AND MONITORING INCLUDED IN AGENCY ALTERNATIVES	2-53
Administration and Monitoring	2-53
Annual Reporting.....	2-55
Air Resources	2-55
Monitoring.....	2-55
Geochemistry and Metals Leaching	2-56
Commingle Tailings and Waste in TWSF	2-56
Post-Mining Monitoring, Action Limits and Response.....	2-56
Geotechnical Stability of Facilities and Consequences of Failure	2-57
Mitigation Measures for Stability.....	2-57
Sediment	2-58
Sediment Control Monitoring	2-58
Soils.....	2-59

Monitoring.....	2-59
Water Resources.....	2-59
Emergency Management, Spill Control and Fire	2-61
Spill Control	2-61
Fire Protection	2-62
Emergency Management	2-62
Heritage and Cultural Resources.....	2-63
Monitoring.....	2-63
Land Use	2-63
Noise	2-63
Reclamation.....	2-63
Mitigation and Management	2-64
Monitoring.....	2-65
Financial Assurance	2-66
Recreation	2-66
Socioeconomic Issues.....	2-66
Transportation	2-66
Mitigation.....	2-67
Monitoring	2-68
Visual Resources.....	2-68
Vegetation and Timber Resources	2-68
Weed Control	2-69
Wetlands/Riparian	2-69
Monitoring	2-69
Wildlife	2-69
Other Mitigation	2-70
ALTERNATIVES CONSIDERED BUT DISMISSED FROM DETAILED	
CONSIDERATION.....	2-74
Facility Design, Location and Sizing	2-74
Mill.....	2-74
TWSF	2-74

Water Treatment Facilities	2-75
Work Camp	2-76
Mining Methods	2-77
Shaft Access	2-77
Process Water and Tailings Transport	2-77
Paste vs. Slurry	2-77
Sediment Control.....	2-77
Utility Corridors	2-78
Powerline	2-78
Project Access Routes	2-78
Reclamation and Closure	2-78
Upgradient Alluvial Capture System.....	2-79
Bedrock Capture System Using Tunnels.....	2-79
Capture Location at the Base of Ram Gulch.....	2-80
Water Treatment Process	2-80
Mine Backfill	2-80
CHAPTER 3. AFFECTED ENVIRONMENT.....	3-1
INTRODUCTION	3-1
GEOLOGY AND GEOTECHNICAL CHARACTERISTICS	3-2
Physiography	3-2
Regional Geology.....	3-2
Geology of the Idaho Cobalt Project Area.....	3-2
Mining History of Idaho Cobalt Project Area	3-5
Blackbird Mine District.....	3-5
Idaho Cobalt Project.....	3-5
Other Mining Activity	3-5
Cobalt Production and Uses.....	3-5
Property Status	3-6
Existing Geotechnical Environment.....	3-6
Earthquakes (Seismicity).....	3-6
WATER RESOURCES	3-6

Past and Ongoing Actions Relevant to Current Conditions	3-8
Blackbird Mine Site.....	3-8
Ongoing CERCLA Response and Restoration Action	3-10
Clear Creek Fire	3-10
Groundwater Resources	3-11
Occurrence of Groundwater	3-11
Aquifer Properties	3-13
Groundwater Flow	3-14
Groundwater Quality	3-16
Surface Water Resources	3-18
Streamflows	3-18
Springs, Seeps and Wetlands	3-25
Sediment Yield and Quality	3-27
Geochemistry	3-29
Geochemical Testing Program	3-29
Comparison to Blackbird Mine	3-30
Acid Generation Risk.....	3-31
Metals Leaching Risk	3-32
SOIL RESOURCES	3-33
Soils Study Area.....	3-33
Project Area Land Types and Soils	3-34
Project Area Soil Descriptions.....	3-34
Mountain Slope Sites	3-34
Big Flat Area	3-36
CLIMATE AND AIR QUALITY	3-36
Climate	3-36
Temperature.....	3-36
Precipitation	3-36
Wind	3-37
Evaporation	3-37
Air Quality.....	3-37

NOISE RESOURCES	3-38
Noise	3-38
Noise-Sensitive Receptors	3-38
Ambient Noise Level Measurements.....	3-38
VEGETATION RESOURCES	3-39
Existing Vegetation	3-39
Fire Ecology	3-41
Old Growth.....	3-41
Noxious Weeds	3-42
Special-Status Species	3-42
Wetlands	3-42
WILDLIFE RESOURCES.....	3-42
Management Direction	3-42
Analysis Area	3-43
Affected Environment.....	3-43
Past Events That Have Affected Current Conditions.....	3-43
Threatened and Endangered Species.....	3-46
Gray Wolf	3-46
Canada Lynx.....	3-47
Yellow-billed Cuckoo	3-49
Region 4 Sensitive Species.....	3-49
Wolverine	3-49
Fisher	3-49
Bald Eagle.....	3-50
Northern Goshawk	3-50
Three-toed Woodpecker.....	3-51
Spotted Frog	3-51
Management Indicator Species (MIS).....	3-51
Greater Sage Grouse	3-51
Pileated Woodpecker	3-52
Spotted Frog	3-52

Idaho Species of Concern	3-52
Boreal Owl.....	3-52
Migratory Birds	3-52
Big Game	3-53
Elk.....	3-53
Deer	3-53
Moose	3-53
Black Bear.....	3-53
Big Horn Sheep and Mountain Goats.....	3-53
Other Species	3-53
Bats.....	3-53
Other Mammals.....	3-54
Raptors.....	3-54
Amphibians and Reptiles.....	3-54
FISHERIES RESOURCES	3-54
Background.....	3-54
Management Direction	3-57
Salmon-Challis Forest Land Management Plan	3-57
Special Status Fish Species.....	3-57
Chinook Salmon.....	3-57
Sockeye Salmon	3-57
Steelhead.....	3-58
Bull Trout.....	3-58
Westslope Cutthroat Trout	3-58
Affected Environment.....	3-58
Actions that have Affected Current Conditions.....	3-58
Existing Conditions.....	3-58
Panther Creek.....	3-59
Big Deer Creek.....	3-59
South Fork Big Deer Creek	3-60
Bucktail Creek.....	3-60

Little Deer Creek	3-60
Big Flat Creek	3-61
Blackbird Creek.....	3-61
Williams Creek	3-61
Moccasin Creek	3-62
Deep Creek	3-62
Fish Populations.....	3-62
Macroinvertebrate Populations.....	3-64
ROAD AND ACCESS MANAGEMENT	3-65
LAND USE AND RECREATION RESOURCES	3-67
Land Use.....	3-67
Recreation.....	3-69
Recreation Opportunity Spectrum	3-69
Developed Federal Sites.....	3-71
Trails	3-71
Fish and Wildlife	3-71
Wild and Scenic Rivers	3-71
Winter Sports	3-72
SOCIAL AND ECONOMIC RESOURCES.....	3-72
Socioeconomic Resources.....	3-72
Social Life.....	3-72
Population Trends and Demographic Characteristics	3-73
Community Service Providers.....	3-74
Education	3-74
Law Enforcement	3-74
Fire Protection.....	3-74
Ambulance Service	3-75
Health Care	3-75
Public Assistance	3-75
Water Supply.....	3-75
Wastewater Treatment.....	3-75

Solid Waste	3-76
Economy	3-76
Employment and Income.....	3-76
Housing.....	3-77
HERITAGE RESOURCES.....	3-77
Cultural Resource Inventories.....	3-78
Consultations with American Indian Tribes	3-78
ROADLESS / WILDERNESS AND VISUAL RESOURCES.....	3-79
Roadless and Wilderness Resources	3-79
Visual Resources	3-79
Management Direction	3-79
Visual Quality Objectives.....	3-79
BLACKBIRD MINE SITE ACTIVITIES	3-81
Blackbird Mine Site History	3-81
Mining History	3-82
Summary of CERCLA Actions.....	3-83
CHAPTER 4. ENVIRONMENTAL CONSEQUENCES.....	4-1
INTRODUCTION	4-1
Assumptions for the Action Alternatives.....	4-2
Methodology.....	4-2
DIRECT, INDIRECT AND CUMULATIVE IMPACTS OF ALTERNATIVES CONSIDERED.....	4-2
Geology and Geotechnical Characteristics	4-2
Summary.....	4-2
Alternative I - No Action Alternative.....	4-3
Alternative II - Company's Proposal	4-3
Alternative III - Perpetual Mine Dewatering and Land Application Water Discharge.....	4-4
Alternative IV - Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream and Surface Discharge to Big Deer Creek.....	4-5

Alternative V - Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant and Surface Discharge to Blackbird Creek	4-5
Water Resources	4-5
Summary.....	4-5
Alternative I - No Action Alternative.....	4-11
Alternative II - Company's Proposal	4-12
Alternative III - Relocation of TWSF, Perpetual Mine Dewatering, and Land Application Water Discharge.....	4-35
Alternative IV - Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream and Surface Discharge to Big Deer Creek.....	4-38
Alternative V - Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant and Surface Discharge to Blackbird Creek	4-45
Soil Resources	4-46
Summary.....	4-46
Alternative I - No Action	4-46
Alternative II - Company's Proposal	4-47
Alternative III - Perpetual Mine Dewatering and Land Application Water Discharge	4-47
Alternative IV - Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream and Surface Discharge to Big Deer Creek	4-47
Alternative V - Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant and Surface Discharge to Blackbird Creek.....	4-47
Climate and Air Quality	4-48
Summary.....	4-48
Alternative I - No Action Alternative.....	4-48
Alternative II - Company's Proposal	4-48

Alternative III - Perpetual Mine Dewatering and Land Application Water Discharge.....	4-49
Alternative IV - Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream and Surface Discharge to Big Deer Creek.....	4-49
Alternative V - Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant and Surface Discharge to Blackbird Creek	4-49
Noise Resources	4-49
Summary.....	4-49
Alternative I - No Action	4-50
Alternative II - Company’s Proposal	4-50
Alternative III - Perpetual Mine Dewatering and Land Application Water Discharge.....	4-51
Alternative IV - Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream and Surface Discharge to Big Deer Creek.....	4-51
Alternative V - Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant and Surface Discharge to Blackbird Creek	4-52
Vegetation and Wetland Resources.....	4-52
Summary	4-52
Alternative I - No Action Alternative	4-52
Alternative II - Company’s Proposal.....	4-52
Alternative III - Perpetual Mine Dewatering and Land Application Water Discharge	4-54
Alternative IV - Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream and Surface Discharge to Big Deer Creek.....	4-55

Alternative V - Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant and Surface Discharge to Blackbird Creek.....	4-56
Wildlife Resources	4-56
Summary	4-56
Alternative I - No Action	4-56
Alternative II - Company's Proposal.....	4-56
Alternative III - Perpetual Mine Dewatering and Land Application Water Discharge	4-59
Alternative IV - Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream and Surface Discharge to Big Deer Creek.....	4-59
Alternative V - Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant and Surface Discharge to Blackbird Creek.....	4-60
All Alternatives	4-60
Fisheries Resources	4-60
Summary	4-61
Alternative I - No Action	4-70
Alternative II - Company's Proposal.....	4-71
Alternative III - Perpetual Mine Dewatering and Land Application Water Discharge	4-73
Alternative IV - Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream and Surface Discharge to Big Deer Creek.....	4-74
Alternative V - Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant and Surface Discharge to Blackbird Creek.....	4-76
Consultation with NMFS and FWS on Fisheries	4-76
Road and Access Management	4-77
Summary	4-77

Alternative I - No Action	4-78
Alternative II - Company's Proposal.....	4-78
Alternative III - Perpetual Mine Dewatering and Land Application Water Discharge	4-81
Alternative IV - Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream and Surface Discharge to Big Deer Creek.....	4-82
Alternative V - Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant and Surface Discharge to Blackbird Creek.....	4-82
Comparison of Alternatives.....	4-82
Land Use.....	4-82
Summary	4-82
Alternative I - No Action	4-83
Alternative II - Company's Proposal.....	4-83
Alternative III - Perpetual Mine Dewatering and Land Application Water Discharge	4-84
Alternative IV - Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream and Surface Discharge to Big Deer Creek.....	4-84
Alternative V - Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant and Surface Discharge to Blackbird Creek.....	4-84
Recreation Resources.....	4-84
Summary	4-84
Alternative I - No Action	4-85
Alternative II - Company's Proposal.....	4-85
Alternative III - Perpetual Mine Dewatering and Land Application Water Discharge	4-87

Alternative IV - Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream and Surface Discharge to Big Deer Creek.....	4-87
Alternative V - Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant and Surface Discharge to Blackbird Creek.....	4-87
Visual Resources	4-87
Summary	4-87
Alternative I - No Action	4-88
Alternative II - Company's Proposal.....	4-88
Alternative III - Perpetual Mine Dewatering and Land Application Water Discharge	4-89
Alternative IV - Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream and Surface Discharge to Big Deer Creek.....	4-89
Alternative V - Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant and Surface Discharge to Blackbird Creek.....	4-90
Wilderness Resources	4-90
Summary	4-90
Social and Economic Resources.....	4-90
Summary	4-90
Alternative I - No Action	4-90
Alternative II - Company's Proposal.....	4-91
Alternative III - Perpetual Mine Dewatering and Land Application Water Discharge	4-91
Alternative IV - Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream and Surface Discharge to Big Deer Creek.....	4-91

Alternative V - Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant and Surface Discharge to Blackbird Creek.....	4-91
Heritage Resources	4-91
Summary	4-91
Alternative I - No Action	4-92
Alternative II - Company’s Proposal.....	4-92
Alternative III - Perpetual Mine Dewatering and Land Application Water Discharge	4-92
Alternative IV - Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream and Surface Discharge to Big Deer Creek.....	4-93
Alternative V - Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant and Surface Discharge to Blackbird Creek.....	4-93
Blackbird Mine Site	4-93
Summary	4-93
Alternative I - No Action	4-94
Alternative II - Company’s Proposal.....	4-94
Alternative III - Perpetual Mine Dewatering and Land Application Water Discharge	4-96
Alternative IV - Lower Bucktail Groundwater Capture, Modified Water Treatment to Reduce Waste Stream and Surface Discharge to Big Deer Creek.....	4-97
Alternative V - Lower Bucktail Groundwater Capture, Water Treatment at Site of Blackbird Treatment Plant and Surface Discharge to Blackbird Creek.....	4-98
CUMULATIVE EFFECTS.....	4-99
Summary.....	4-99
Geology and Geotechnical Resources.....	4-100
Water Resources	4-100

Alternative I - Cumulative Effects.....	4-101
Alternative II - Cumulative Effects.....	4-102
Alternative III - Cumulative Effects.....	4-103
Alternative IV - Cumulative Effects	4-104
Alternative V - Cumulative Effects	4-105
Watershed Risk Assessment.....	4-105
Soil Resources.....	4-107
Air Resources.....	4-107
Noise.....	4-108
Vegetation and Wetlands Resources	4-108
Wildlife Resources	4-109
Fisheries.....	4-109
Road and Access Management	4-109
Land Use.....	4-110
Recreation Resources.....	4-111
Visual Resources	4-111
Wilderness Resources	4-111
Socioeconomic Resources.....	4-112
Heritage Resources	4-112
SHORT-TERM USES AND LONG-TERM PRODUCTIVITY	4-112
Geology and Geotechnical Resources.....	4-112
Water Resources	4-112
Soil Resources.....	4-112
Air Quality.....	4-113
Noise.....	4-113
Vegetation and Wetlands	4-113
Wildlife	4-113
Fisheries.....	4-113
Transportation.....	4-113
Land Use.....	4-113
Recreation Resources.....	4-113

Visual Resources	4-114
Wilderness Resources	4-114
Social and Economic Resources.....	4-114
Heritage Resources	4-114
UNAVOIDABLE ADVERSE EFFECTS	4-114
Geology and Geotechnical Resources	4-114
Water Resources	4-114
Soil Resources	4-115
Air Quality.....	4-115
Noise	4-115
Vegetation and Wetlands	4-115
Wildlife	4-115
Fisheries.....	4-115
Transportation	4-116
Land Use.....	4-116
Recreation Resources.....	4-116
Visual Resources	4-116
Wilderness Resources	4-116
Social and Economic Resources.....	4-116
Heritage Resources	4-116
IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES	4-116
Geology and Geotechnical Resources	4-116
Water Resources	4-116
Soil Resources	4-117
Air Quality.....	4-117
Noise	4-117
Vegetation and Wetlands	4-117
Wildlife	4-117
Fisheries.....	4-117
Transportation	4-117

Land Use.....	4-118
Recreation Resources.....	4-118
Visual Resources	4-118
Wilderness Resources	4-118
Social and Economic Resources.....	4-118
Heritage Resources	4-118
EVALUATION OF OTHER EFFECTS.....	4-118
POSSIBLE CONFLICTS WITH OTHER PLANS, POLICIES OR PROGRAMS	4-119
ENVIRONMENTAL JUSTICE	4-119
CHAPTER 5. CONSULTATION AND COORDINATION	5-1
PUBLIC INVOLVEMENT SUMMARY	5-1
CONSULTATION WITH AGENCIES, ORGANIZATIONS, AND TRIBAL GOVERNMENTS.....	5-2
PREPARERS AND CONTRIBUTORS.....	5-4
DISTRIBUTION OF THE ENVIRONMENTAL IMPACT STATEMENT.....	5-9
CHAPTER 6. ACRONYMS AND GLOSSARY.....	6-1
CHAPTER 7. REFERENCES	7-1

LIST OF TABLES

TABLE 1-1.	MAJOR PERMITS, APPROVALS, AND CONSULTATIONS POTENTIALLY REQUIRED FOR THE IDAHO COBALT PROJECT	1-11
TABLE 2-1.	CHEMICALS, REAGENTS AND OPERATING SUPPLIES.....	2-6
TABLE 2-2.	MINE AND MILL EQUIPMENT	2-15
TABLE 2-3.	IDAHO COBALT PROJECT - NEW SITE DISTURBANCE.....	2-39
TABLE 2-4.	MINE GROUNDWATER CAPTURE CRITERIA.....	2-46
TABLE 3-1.	SUMMARY OF 2002-2005 GROUNDWATER QUALITY MONITORING RESULTS BY AREA FROM THE IDAHO COBALT PROJECT	3-17
TABLE 3-2.	ICP AREA STREAMFLOW MEASUREMENT AND ESTIMATE SUMMARY	3-19
TABLE 3-3.	WATER QUALITY AND TMDL STATUS OF STREAMS IN THE PANTHER CREEK WATERSHED.....	3-20
TABLE 3-4.	WATER QUALITY IN BIG FLAT AND LITTLE DEER CREEKS	3-21
TABLE 3-5.	WATER QUALITY IN BUCKTAIL, SOUTH FORK BIG DEER, AND BIG DEER CREEKS.....	3-22
TABLE 3-6.	BLACKBIRD CREEK AND PANTHER CREEK WATER QUALITY DATA	3-24
TABLE 3-7.	BOISED MODEL RESULTS FOR PRE-ICP CONDITIONS.....	3-28
TABLE 3-8.	SUMMARY OF GEOCHEMICAL TESTS CONDUCTED ON SAMPLES FROM THE RAM AND SUNSHINE DEPOSITS.....	3-30
TABLE 3-9.	AVERAGE MONTHLY TEMPERATURES AT COBALT, IDAHO.....	3-37
TABLE 3-10.	ICP AREA AMBIENT NOISE LEVEL MEASUREMENTS	3-39
TABLE 3-11.	VEGETATION HABITAT TYPES IN IDAHO COBALT PROJECT AREA.....	3-40

TABLE 3-12.	PROBABILITY OF OCCURRENCE OF THREATENED, ENDANGERED, REGION 4 SENSITIVE, MIS, AND IDAHO SPECIES OF CONCERN (LEMHI COUNTY) IN AND ADJACENT TO THE PROJECT AREA.....	3-44
TABLE 3-13.	SUMMARY OF FISH KNOWN TO BE PRESENT (P) IN PROJECT AREA STREAMS	3-63
TABLE 3-14.	MEAN ABUNDANCE ESTIMATES FOR CHINOOK, RAINBOW/STEELHEAD, CUTTHROAT TROUT, BULL TROUT, AND TOTAL FISH ABUNDANCE FOR ICP PROJECT AREA STREAMS	3-64
TABLE 3-15.	IDEQ MBI SCORES ALONG WITH TOTAL AND EPT SPECIES ABUNDANCE AND RICHNESS IN ICP AREA STREAM	3-65
TABLE 3-16.	PROJECT ACCESS ROUTE AVERAGE DAILY TRAFFIC (ADT) DATA	3-66
TABLE 3-17.	POPULATION TRENDS - STATE OF IDAHO, LEMHI COUNTY, SALMON, CUSTER COUNTY, AND CHALLIS.....	3-73
TABLE 4-1.	ALTERNATIVE II WATER TREATMENT PREDICTIONS (NOMINAL CONCENTRATIONS)	4-15
TABLE 4-2.	ESTIMATES OF POLLUTANT DISCHARGE THROUGH OUTFALL 001 (AVERAGE AND DAILY VALUES)	4-16
TABLE 4-3.	TECHNOLOGY-BASED EFFLUENT LIMITS.....	4-16
TABLE 4-4.	WATER QUALITY CRITERIA APPLICABLE TO THE IDAHO COBALT PROJECT AND BIG DEER CREEK	4-18
TABLE 4-5.	DRAFT NPDES PERMIT PROPOSED EFFLUENT LIMITS AND MONITORING REQUIREMENTS	4-19
TABLE 4-6.	AMBIENT SURFACE WATER MONITORING REQUIREMENTS AT WQ-24 AND DOWNSTREAM STATION	4-20
TABLE 4-7.	PREDICTED DISSOLVED COPPER CONCENTRATIONS IN GROUNDWATER	4-24

TABLE 4-8.	DSM PREDICTED COPPER CONCENTRATIONS IN STREAMS, MOST PROBABLE OR EXPECTED CASE (50 TH PERCENTILE, 50% PROBABILITY THAT ACTUAL VALUE WILL BE HIGHER THAN VALUE SHOWN).....	4-29
TABLE 4-9.	DSM PREDICTED COPPER CONCENTRATIONS IN STREAMS, 90 TH PERCENTILE (90% PROBABILITY THAT ACTUAL VALUE WILL BE LOWER THAN VALUE SHOWN)....	4-30
TABLE 4-10.	SULFATE MIXING ANALYSIS - BIG DEER CREEK	4-43
TABLE 4-11.	COMPARISON OF MAXIMUM MODELED PM ₁₀ CONCENTRATIONS WITH IDAHO AND FEDERAL AMBIENT AIR QUALITY STANDARDS ICP SITE	4-49
TABLE 4-12.	ESTIMATED NOISE LEVELS AT VARIOUS DISTANCES FROM SOURCE(S)	4-51
TABLE 4-13.	SUMMARY OF CHANGES TO ROAD AND WATERSHED SEDIMENT CONDITIONS FOR ICP ALTERNATIVES.....	4-61
TABLE 4-14.	SUMMARY OF SURFACE STREAM FLOW CHANGES BY ALTERNATIVE.....	4-62
TABLE 4-15.	SUMMARY OF PREDICTED CHANGES TO SURFACE WATER QUALITY BY ALTERNATIVE.....	4-63
TABLE 4-16.	RISK OF MATERIALS RELEASE IN CASE OF AN ACCIDENT DURING TRANSPORT TO THE ICP PROJECT	4-64
TABLE 4-17.	MATERIALS TRANSPORTED FOR THE ICP ALTERNATIVES ALONG WITH ACCIDENT PROBABILITIES AND ESTIMATED YEARS BETWEEN AN ACCIDENT NEAR A STREAM.....	4-65
TABLE 4-18.	TRANSPORT MATERIAL INFORMATION AND QUANTITY OF MATERIAL REQUIRED TO REACH AQUATIC TOXICITY LEVELS IN ICP AREA STREAMS SIMULATING A SHORT SPILL	4-66
TABLE 4-19.	PROJECT ACCESS ROUTE MITIGATION – ALTERNATIVE II VS. ALTERNATIVES III-V	4-80

TABLE 4-20.	ICP SITE ROAD COMPARISON.	4-80
TABLE 4-21.	ICP ALTERNATIVE DISTURBANCE BY LAND MANAGEMENT AREA.....	4-83
TABLE 4-22.	ROAD DENSITIES AND WATERSHED RISK	4-106
TABLE 4-23.	EQUIVALENT CLEARCUT ACRES AND WATERSHED RISK.....	4-106
TABLE 4-24.	RISK OF CUMULATIVE WATERSHED EFFECTS UNDER EXISTING CONDITIONS.....	4-107

LIST OF FIGURES

FIGURE 1-1. GENERAL LOCATION MAP, IDAHO COBALT PROJECT	1-2
FIGURE 2-1. GENERAL FACILITY LOCATION ALTERNATIVE II.....	2-3
FIGURE 2-2. PROPOSED TRANSPORTATION ROUTE	2-5
FIGURE 2-3. DETAIL RAM WORKINGS OBLIQUE VIEW.....	2-10
FIGURE 2-4. RAM PORTAL GENERAL ARRANGEMENT	2-12
FIGURE 2-5. PLANT SITE GENERAL ARRANGEMENT.....	2-16
FIGURE 2-6. TWSF PLAN VIEW	2-17
FIGURE 2-7. CONCENTRATOR PLANT FLOWSHEET	2-19
FIGURE 2-8. WATER BALANCE FLOW DIAGRAM	2-23
FIGURE 2-9. WATER MANAGEMENT PONDS DETAILS.....	2-25
FIGURE 2-10. WATER TREATMENT CONCEPTUAL PROCESS FLOW SHEET	2-27
FIGURE 2-11. ALTERNATIVE III PERPETUAL DEWATERING AND LAND APPLICATION/DISCHARGE	2-37
FIGURE 2-12. ALTERNATIVE IV LOWER BUCKTAIL GROUNDWATER CAPTURE - ADVANCED WATER TREATMENT AND DISCHARGE TO BIG DEER CREEK	2-43
FIGURE 2-13. ALTERNATIVE V LOWER BUCKTAIL GROUNDWATER CAPTURE - ADVANCED WATER TREATMENT AND DISCHARGE TO BLACKBIRD CREEK	2-51
FIGURE 3-1. REGIONAL GEOLOGY, IDAHO COBALT BELT	3-3
FIGURE 3-2. IDAHO COBALT PROJECT AREA GEOLOGY	3-4
FIGURE 3-3. IDAHO COBALT PROJECT PROPERTY OWNERSHIP AND CLAIMS.....	3-7
FIGURE 3-4. STREAMS AND WATERSHED BOUNDARIES, IDAHO COBALT PROJECT AREA	3-9
FIGURE 3-5. GROUNDWATER MONITORING NETWORK.....	3-12
FIGURE 3-6. POTENTIOMETRIC SURFACE JUNE 2003.....	3-15

FIGURE 3-7. WATER QUALITY CHANGES IN SOUTH FORK BIG DEER CREEK.....	3-23
FIGURE 3-8. SURFACE WATER MONITORING SITES - SPRINGS, SEEPS AND WETLANDS IN THE IDAHO COBALT PROJECT AREA	3-26
FIGURE 3-9. ACID GENERATION POTENTIAL AND ACID NEUTRALIZING POTENTIAL OF RAM AND SUNSHINE DEVELOPMENT ROCK SAMPLES FROM THE ICP	3-32
FIGURE 3-10. IDAHO COBALT PROJECT LANDTYPE UNITS	3-35
FIGURE 3-11. FIRE INTENSITY 2000 CLEAR CREEK BURN, SALMON-CHALLIS NATIONAL FOREST	3-45
FIGURE 3-12. LYNX ANALYSIS UNIT (LAU).....	3-48
FIGURE 3-13. PROJECT ACCESS ROUTE ALTERNATIVES	3-55
FIGURE 3-14. AQUATIC SAMPLING SITES, IDAHO COBALT PROJECT AREA	3-56
FIGURE 3-15. LAND USE MANAGEMENT AREAS	3-68
FIGURE 3-16. RECREATIONAL OPPORTUNITIES SPECTRUM TRAILS AND RECREATION SITES.....	3-70
FIGURE 3-17. VISUAL QUALITY OBJECTIVES.....	3-80
FIGURE 4-1. ACCESS ROUTE MITIGATION WILLIAMS CREEK ACCESS ROUTE	4-79

LIST OF APPENDICES

- APPENDIX A LIST OF SUPPORTING TECHNICAL REPORTS, MEMOS AND OTHER DOCUMENTS
- APPENDIX B SURFACE WATER AND GROUNDWATER FLOWS AND PREDICTED WATER QUALITY
- APPENDIX C WATER MANAGEMENT GOALS AND DECISIONS
- APPENDIX D RESPONSES TO COMMENTS ON THE DEIS
- APPENDIX E U.S. FISH AND WILDLIFE SERVICE BIOLOGICAL OPINION
- APPENDIX F NATIONAL MARINE FISHERIES SERVICE BIOLOGICAL OPINION