

5.0 SUMMARY OF COMPLIANCE WITH ROD REQUIREMENTS

5.1 PREVENTION OF ADVERSE HUMAN HEALTH OR ECOLOGICAL IMPACTS

The design and operation of the BCR should prevent adverse human health or ecological impacts. During construction, direct exposure to and airborne transport of contaminated soil and dust will be limited through use of access restrictions (fences) and dust suppression (watering and temporary cover). Adverse impacts to nearby residents will be limited by the rural location of the site, requirements for load covering, and truck decontamination procedures. Adverse human health or ecological impacts due to offsite waterborne transport of contaminated soil will be limited by implementation of site BMPs, a surface water management system, placement of additional slope armoring, as needed, to prevent erosion, and engineering controls to minimize the potential for slope failure.

5.2 PREVENTION OF ADDITIONAL GROUNDWATER AND/OR SURFACE WATER IMPACTS

Placement of a repository on top of the existing tailings pond should result in reduced rates of migration of metals to groundwater compared to existing conditions. Hydrologic modeling indicates that percolation of water through the tailings pond to groundwater will be reduced by about 60 percent or more after placement of the final cover compared to existing conditions.

Surface water monitoring, as described in Section 2.6, indicates that concentrations of the human health and ecological chemicals of concern (arsenic, cadmium, copper, lead, and zinc) in Big Creek do not increase as a result of discharge of groundwater from beneath the BCR to Big Creek. Placement of a final cover, implementation of a surface water management system, placement of additional slope armoring to prevent erosion, and engineering controls to minimize the potential for slope failure should further limit surface water impacts.

The final cover system will be required to meet a percolation performance standard of 4 inches per year (maximum). Contaminant transport modeling, which is documented in Appendix B of the Big Creek Repository Design Analysis Report, was used to evaluate the potential for waste materials placed in the repository to impact groundwater and surface water. At this maximum percolation rate, modeling indicates that metals (antimony, arsenic, cadmium, lead, and zinc) leached from waste materials placed in the repository would not impact groundwater or surface water at concentrations exceeding surface water quality standards within the foreseeable future.

5.3 INTEGRATION WITH PAST OR NEARBY CLEANUP EFFORTS

The proposed BCR is not the location of any past cleanup actions or future remedial actions under the ROD. However, the site is centrally located and easily accessed for disposal of yard waste and other materials generated by remedial actions implemented under the ROD. In

addition, use of an existing tailings pond eliminates the negative impact of using clean, unaffected land for a waste disposal site.

5.4 COMPLIANCE WITH ARARS

RCRA Subtitle D (40 CFR Part 257, Subpart A) criteria are applicable for management and disposal of material generated by cleanup activities pursuant to the Selected Remedy. Idaho Solid Waste Management Rules (IDAPA 58.01.06) explicitly do not apply to “waste dumps, tailings and other materials uniquely associated with mineral extraction, beneficiation or processing operation” and thus are not applicable.

RCRA Subtitle C criteria are not applicable because solid wastes from the extraction, beneficiation, and some processing of ores and minerals are excluded from Subtitle C requirements by the Bevill Amendment (42 USC§6921(b)(3)(A)). However, Idaho Solid Waste Management Rules Tier II (non-municipal solid waste) landfill requirements are relevant and appropriate. Idaho Solid Waste Management Rules Tier III (non-municipal solid waste where leachate or gas may be formed) and Subtitle C requirements are not relevant and appropriate because no metal concentrates will be disposed of in the BCR and all material must meet the waste acceptance criteria. Table 5-1 summarizes how the BCR will achieve compliance with the applicable requirements of RCRA Subtitle D, the relevant and appropriate requirements of the Idaho Solid Waste Management Rules for Tier II facilities, and other applicable or relevant and appropriate requirements identified in the OU3 ROD.

5.5 APPROPRIATENESS FOR THE CHARACTERISTICS OF THE WASTE

The BCR will be used primarily for disposal of contaminated yard soil and incidental debris and is appropriate for disposal of these materials. The yard soil will typically contain lead at concentrations ranging from 700 to 67,000 mg/kg and arsenic at concentrations up to 3,600 mg/kg (ROD Table 5.2-2). The estimated average concentrations of lead and arsenic in yard soil that will be disposed of in the BCR are 1,764 mg/kg and 34 mg/kg, respectively. Estimated average concentrations of metals in yard soil that will be disposed of in the BCR are summarized in Table 5-2. The yard soil is not considered principal threat material because it is not a metal concentrate and contains concentrations below the principal threat material levels established for the Bunker Hill Box². Material must meet the waste acceptance criteria and be managed in a manner appropriate for its characteristics. The BCR may also be used for disposal of other mining-related contaminated soil and sediment. The maximum concentrations of contaminants in this material will be limited by the waste acceptance criteria. Consequently, this material also does not meet the definition of principal threat material.

² Concentrations used to identify principal threat material within the Bunker Hill Box were: 127,000 ppm antimony; 15,000 ppm arsenic; 71,000 ppm cadmium; 84,600 ppm lead; 33,000 ppm mercury (Source: Bunker Hill Non-Populated Areas ROD, ROD ID: EPA/ROD/R10-92/041, Date: 09/22/1992).

5.6 COST-EFFECTIVENESS

The estimated capital cost through closure of the BCR is approximately \$3,200,000. Assuming 140,000 cubic yards of yard waste are placed in the repository (the total repository capacity is approximately 250,000 cubic yards), the estimated capital cost per cubic yard of waste disposed is approximately \$23. The estimated net present value of 30 years of post-closure operations and maintenance (O&M) is approximately \$600,000, based on a discount rate of 3.5 percent. The estimated average annual O&M cost is approximately \$33,000.

5.7 MINIMIZATION OF LONG-TERM OPERATION AND MAINTENANCE (O&M) COSTS

One objective of the repository design, operations plan, and closure plan is to minimize O&M costs. Measures that will be included in the repository design, operation, and closure to minimize O&M costs include, but are not limited to:

- The repository side slopes and final cover will be designed to limit erosion and minimize O&M costs associated with repair of the cover and treatment of collected runoff water
- BMPs will be implemented to minimize erosion
- Waste placed in the repository will be compacted to limit erosion prior to placement of the final cover and to minimize potential settlement
- Controlled placement of waste will be used to limit the potential for slope failure
- Additional armoring will be placed along the channel of Big Creek, as needed, to limit future erosion by Big Creek during high flow periods

5.8 TRANSPORTATION IMPACTS AND COSTS

Waste material will be delivered to the BCR by truck, using the existing paved Big Creek Road. The road is suitable for the truck volumes and weights that will result from operation of the repository, however, it is anticipated that there will be some increase in the frequency of required road maintenance. Big Creek Road runs through a rural area, so minimal disruption to residents would occur during construction and operation of the repository.

Yard soil will be trucked to the BCR from throughout the Basin; however, based on estimates made for the FS, about 80 percent of the yard soil will come from the Upper Basin between Mullan and Elizabeth Park.

The annual truck traffic volume will depend on the number of yards remediated each year and the average volume of soil removed from the yards. For a typical yard in the Basin,

approximately 150 cubic yards (cy) of soil will be removed. For example, if 100 yards are remediated each year, the annual traffic for a 10-cy truck would be 1,500 trucks.

5.9 ECONOMIC DEVELOPMENT OR FUTURE REUSE OF THE SITE WHERE FEASIBLE

The State of Idaho has determined that the final land use for the Big Creek Repository will be open space. The site will not be designated for recreation, industrial uses, or private uses without an intensive investigation into the potential for unacceptable impacts to human health or the environment as a result of such use. IDEQ owns the property and will ensure that institutional controls are maintained to ensure appropriate land uses.

5.10 ABSENCE OR PRESENCE OF MINING-RELATED CONTAMINANTS

The existing tailings pond contains metals, including antimony and arsenic, at concentrations that could limit future site redevelopment due to concerns for protection of human health. Thus, use of the site as a yard soil repository would not further limit economic development in the Silver Valley.

5.11 GEOTECHNICAL STABILITY

The repository will be loaded slowly using a phased filling procedure that allows the tailings material to develop strength and limit the potential for slope failure. In addition, pore water pressures and settlement will be monitored throughout the operating life of the repository. These additional data will verify that the repository is being fill in a safe manner. Long-term stability will be further enhanced by placing a final cover that limits percolation of surface water. A geotechnical analysis of the stability of the BCR concluded that, if the site is loaded and capped properly, the repository will be stable during filling and after placement of the final cover.

5.12 AVAILABILITY OF CLEAN COVER MATERIAL

Clean, low permeability soil or topsoil is expected to be scarce, and the cover design has been selected with consideration of this limitation. The cover will consist of a minimum 6-inch topsoil layer and an 18-inch select fill layer. The select fill layer may contain up to 1,000 mg/kg lead to permit a wider range of source areas for final cover material, potentially including some material segregated from incoming waste streams.

5.13 COMMUNITY ACCEPTANCE

Community involvement activities included a briefing of the Shoshone County Commissioners on May 1, 2002, a meeting with representatives of the Shoshone Country Club on May 15, 2002,

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and door-to-door community updates on May 15, 2002. No objections to the repository location were raised. Numerous briefings have also been provided to the Basin Commission TLG, and use of this location has been explicitly discussed in the 2003, 2004, and 5-year Basin Commission Work Plans with no objections being raised.

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**Table 5-1
 Summary of Compliance with ARARs**

Citation	Summary of Requirements	Status ¹	How Compliance Will Be Achieved
40CFR257 Subpart A (RCRA Subtitle D)	Facility or practices in floodplains will not restrict flow of base flood, reduce the temporary water storage capacity of the floodplain, or otherwise result in a washout of solid waste.	Applicable	The existing tailings ponds is within the 100-year floodplain; however, the BCR will not restrict flood flows or storage. Armoring of sideslopes will be used, as needed, to limit erosion of the tailings pond during flood flows. The armoring process will not significantly reduce the flood flow capacity of Big Creek.
	Facility or practices shall not cause or contribute to taking of any endangered or threatened species.		Gray wolf (<i>Canis lupus</i>) is the only listed (threatened or endangered) species likely to occur within the active portion of the facility. The closed facility will not be incompatible with wolf presence. Listed fish (e.g., bull trout) that could occur in Big Creek are protected through use of surface water controls within the BCR.
	Facility or practices shall not result in the destruction or abuse of critical habitat.		Site does not represent critical habitat.
	Facility or practices shall not cause discharge of pollutants into waters of the U.S. in violation of a NPDES permit.		CERCLA actions do not require permits; however, surface water monitoring will be conducted to evaluate whether point discharges meet substantive permit requirements, including surface water quality ARARs identified in the ROD. The storm water management system will be designed to limit the concentrations of metals in point discharges.
	Facility or practices shall not cause discharge of dredged or fill material into waters of the U.S.		BMPs will be used to limit erosion during construction. Establishment of grass cover and implementation of maintenance plan will limit post-construction erosion. Detention pond will limit transport of suspended sediment.

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Table 5-1 (Continued)
Summary of Compliance with ARARs

Citation	Summary of Requirements	Status ¹	How Compliance Will Be Achieved
40CFR257 Subpart A (RCRA Subtitle D) (Continued)	Facility or practices shall not contaminate underground drinking water source beyond facility boundaries.	Applicable	Cover system will reduce percolation and potential for contamination of groundwater compared to conditions prior to disposal of the wastes in the BCR. Contaminant fate and transport modeling indicates that metals leached from waste materials placed in the repository would not impact groundwater at concentrations exceeding surface water quality standards within the foreseeable future. Groundwater monitoring will be conducted to verify compliance.
	The concentration of explosive gases generated at the facility shall not exceed 25% of the LEL for gases in facility structures and shall not exceed the LEL for the gases at the facility boundary.		Little organic material in wastes; no detectable gas generation anticipated.
	Facility or practices shall not pose a hazard to the safety of persons or property from fire.		No flammable materials accepted except wood and vegetation.
	Facility or practices shall not allow uncontrolled public access so as to expose the public to potential health and safety hazards.		The facility will be fenced, and the gate will be locked. Only authorized contractors will have keys to the gate. Public access will not be allowed unless an attendant is present.
IDAPA 58.01.06.012 ² (Tier II Non-Municipal Solid Waste Landfills)	Drainage and Erosion Control. The owner and operator shall install appropriate measures to control erosion and install appropriate measures to control the run-on and runoff from a twenty-five (25) year, twenty-four (24) hour storm event and to provide for the diversion of other surface waters from the closed facility. (.05(d))	Relevant and appropriate	The storm water management system will be designed to collect and control excess runoff compared to pre-project conditions and control erosion based on the 100-year, 24-hour precipitation event.
40 CFR261, 262, and 264 (RCRA Subtitle C)	No applicable or relevant and appropriate requirements	Not applicable or relevant and appropriate	Principal threat material will not be disposed of at the BCR.

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Table 5-1 (Continued)
Summary of Compliance with ARARs

Citation	Summary of Requirements	Status ¹	How Compliance Will Be Achieved
IDAPA 58.01.18.27 (Land Remediation Rules)	Institutional controls may be used to assure both the continued protection of human health and the environment and the integrity of a cleanup action where a cleanup action results in residual concentrations of hazardous substances or petroleum which exceed risk-based health standards.	Relevant and appropriate	Post-closure plan will include administrative controls to ensure appropriate future land use and engineering controls to maintain the integrity of the cover system.
IDAPA 20.03.02 (Surface Mining Regulations)	Section 069. Contains requirements for borrow sources for clean fill for landfill caps, including reclamation plan	Applicable	Source(s) of borrow material have not been identified at this time. If borrow is obtained from a site without an approved reclamation plan, a plan would be developed in accordance with the requirements of the regulation. BMPs will be used during operation and closure of the BCR.
	Section 140. Contains best management practices for placement and consolidation of contaminated material, including nonpoint source sediment control, clearing and grubbing, placement of topsoil conducive to the growth of vegetation, backfilling and grading, and erosion control.	Relevant and appropriate	
IDAPA 58.01.02 (Surface Water Quality Standards)	Point-source surface water discharges must not cause exceedances in the receiving water body of the Idaho water quality standards that had been approved by EPA at the date of the ROD.	Applicable	BMPs will be used to limit erosion and metals transport during construction. Establishment of grass cover and implementation of maintenance plan will limit post-construction erosion. Detention pond will limit transport of suspended sediment. Surface water monitoring will be conducted to evaluate whether point discharges meet Idaho water quality standards.
Clean Water Act Section 304 66FR 18935-18936 (April 12, 2001)	Point-source surface water discharges must not contain cadmium at concentrations that exceed the revised Ambient Water Quality Aquatic Life Criterion.	Relevant and appropriate	Erosion controls and storm water management measures described above will be used to limit concentrations of cadmium in point discharges. Surface water monitoring will be conducted to evaluate whether point discharges meet the revised criterion for cadmium.

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Table 5-1 (Continued)
Summary of Compliance with ARARs

Citation	Summary of Requirements	Status ¹	How Compliance Will Be Achieved
IDAPA 37.03.07 (Stream Channel Alteration Regulations)	Provides minimum standards for design and construction of channel armoring.	Applicable	Riprap channel armoring would be constructed in accordance with the requirements of IDAPA 37.03.07.057 (Dumped rock riprap).
IDAPA 58.01.08.050 (Idaho Drinking Water Regulations) and 40 CFR 141 (Safe Drinking Water Act, National Primary Drinking Water Regulations)	Contaminant concentrations in public drinking water systems must remain below MCLs and non-zero MCL goals.	Relevant and appropriate	There are no public drinking water systems. Therefore, MCLs are not applicable, but may be relevant and appropriate. Antimony and arsenic are present at levels that exceed primary drinking water standards under existing conditions. Cleanup of existing groundwater contamination is outside of the scope of the interim measures selected in the ROD. Closure cover system will reduce water percolation through contaminated repository waste and tailings and limit additional impacts. Use restrictions will be instituted to prohibit installation of drinking water wells in impacted areas.
40 CFR Parts 17, 402 (Endangered Species Act)	Repository construction and operation must not adversely affect any federally-designated threatened or endangered species	Applicable	Gray wolf (<i>Canis lupus</i>) is the only listed (threatened or endangered) species likely to occur within the active portion of the facility. The closed facility will not be incompatible with wolf presence. Listed fish (e.g., bull trout) that could occur in Big Creek are protected through use of surface water controls within the BCR.
16 USC 703 et seq (Migratory Bird Treaty Act)	Unlawful to “hunt, take, capture, kill” or take various other actions adversely affecting a broad range of migratory birds.	Relevant and appropriate	Site is not currently habitat for migratory birds. At closure, waste will be covered with a layer of clean soil that would limit ingestion of contaminants by migratory birds.

Notes

¹ “Applicable” requirements specifically address a hazardous substance, remedial action, location, or other circumstance at a site. “Relevant and appropriate” requirements, while not *applicable*, address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the site.

² Relevant and appropriate requirements for Tier II facilities that are in addition to the 40CFR257 Subpart A requirements

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Table 5-2
Estimated Average Concentrations of Metals in Yard Soil

Metal	Number of Samples	Average Concentration, mg/kg
Antimony	3210	12
Arsenic	3327	34
Cadmium	3327	5.8
Lead	3327	1,764
Zinc	3327	889

Notes

1. Data set used is yard soil samples collected under Remedial Investigation Field Sampling Plan Amendments 6, 12, and 16 between July 1998 and March 2000. A total of 177 residences were sampled.
2. Data set was screened for residences with one or more samples containing >1,000 mg/kg lead (i.e., residences requiring yard soil cleanup). 144 residences were retained. For each residence retained, a mean concentration was computed using all samples. Volume-weighted values of mean, standard deviation, and 90 percent confidence interval reported in this table were computed using the mean concentrations for each residence.

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Table 5-3
Summary of Estimated Costs

Cost Item	Description	Cost
Big Creek Erosion Protection	Riprap 855 ft critical reach	\$195,000
Haul Roads	Construction of on-site haul roads	\$215,000
Storm Water Management System	Includes construction of detention pond, conveyance pipes, and channels	\$253,000
Waste Placement	Includes relocation of 13 kV line, waste placement and compaction, surveying, BMPs	\$1,097,000
Final Cover	2-foot-thick soil cover	\$696,000
Subtotal, Direct Capital Cost		\$2,455,000
Contingency, 15%	15% of direct capital cost	\$368,000
Engineering Support, 6%	6% of direct capital cost plus contingency	\$169,000
Supervision and Administration, 6%	6% of direct capital cost plus contingency	\$169,000
Total Capital Cost		\$3,162,000
Annual Long-Term Operations and Maintenance (O&M) Cost	Includes monitoring, surveying, and maintenance of storm water management system	\$33,000
Present Worth of O&M	30 years of O&M using a 3.5% discount rate	\$602,000
TOTAL CAPITAL + LONG-TERM O&M PRESENT WORTH COST		\$3,764,000

Source: USACE, Big Creek Repository Design Analysis Report