1995

Final Jackpot Mine Project Environmental Impact Statement

United States Department of the Interior Bureau of Land Management

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The Bureau of Land Management is responsible for the balanced management of the public lands and resources and their various values so that they are considered in a combination that will best serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield, a combination of uses that take into account the long-term needs of future generations for renewable and nonrenewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness and natural, scenic, scientific and cultural values.
FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE GREEN MOUNTAIN MINING VENTURE JACKPOT MINE PROJECT FREMONT AND SWEETWATER COUNTIES, WYOMING

Prepared for
Lander Resource Area
Rawlins District
Bureau of Land Management
Rawlins, Wyoming

By
TRC Mariah Associates Inc.
Laramie, Wyoming
MAI Project 1007

December 1995

U.S. Department of the Interior
Bureau of Land Management (BLM)

Abstract:
This Final Environmental Impact Statement (FEIS) assesses the environmental consequences of a proposed uranium mine project in Fremont and Sweetwater Counties, approximately 14 miles southeast of Jeffrey City, Wyoming. This FEIS incorporates by reference most of the material presented in the Draft Environmental Impact Statement (DEIS) for the Green Mountain Mining Venture (GMMV), Jackpot Mine Project, and is designed to be used with the DEIS. Copies of the DEIS are available from the BLM Lander Resource Area at P.O. Box 589, Lander, Wyoming, 82520.

The DEIS was made available to the Environmental Protection Agency and the public on June 22, 1995, and a Notice of Availability was published in the Federal Register. Public meetings were held in Riverton (July 18), Jeffrey City (July 19), Rawlins (July 20), and Rock Springs (July 24, 1995). The public comment period for the DEIS closed August 23, 1995. The Executive Summary from the DEIS, modified as appropriate in response to public comment, is presented herein. DEIS text changes, made in response to public comment and further BLM Interdisciplinary Team analyses, are presented for all modified material by corresponding section in this document. Comments on the DEIS that were received from the public and agencies are reproduced in this document and BLM responses are presented.

The proposed project entails the construction, operation, and reclamation of an underground uranium mine and associated facilities (e.g., roads) by the GMMV. A transportation corridor connecting the proposed mine with the Sweetwater Uranium Mill, approximately 27 miles to the south, would involve the construction of a new transportation route and/or upgrade of existing roads. The proposed project would use standard procedures as currently employed by other underground mining projects, plus additional project-specific and site-specific mitigation measures to ensure that project impacts are minimized for all important resources. Impacts to most resources would be negligible to moderate during the life-of-project. Potentially significant impacts resulting from the project include: fugitive dust emissions along project-required roads; the diversion of No Name Creek; the location of the mine waste rock pile in the No Name Creek Drainage; the temporary preclusion of oil and gas development on areas above the proposed mine; the reactivation of stabilized sand dunes; and the degradation of prehistoric Site 48FR479 and/or the Rawlins-Fort Washakie Stage Road. The proposed project could also have numerous beneficial impacts including increased revenues generated by taxes, increased regional employment opportunities, and increased use of local goods and services.

Further information regarding this document can be obtained from:

Larry Knoch
Rawlins District Office
Bureau of Land Management
1300 North Third Street
Rawlins, Wyoming 82301
This Final Environmental Impact Statement (FEIS) was prepared in accordance with the National Environmental Policy Act of 1969 to assess the environmental consequences of a proposed uranium mine project in the Green Mountain area of southeastern Fremont and northeastern Sweetwater Counties, Wyoming. Public scoping was conducted, with scoping statements mailed to potentially interested parties and the media in April and November, 1993. The Draft Environmental Impact Statement (DEIS) was made available for public review on June 22, 1995, and public meetings were held on July 18, 19, 20, and 24, 1995. All issues identified during scoping, Bureau of Land Management (BLM), Interdisciplinary Team review, and as comments to the DEIS are addressed. The proposed project is in conformance with the BLM Lander and Great Divide Resource Area Resource Management Plans, and the State of Wyoming, Fremont County, and Sweetwater County Land Use Plans.

The proposed project is to explore for and develop uranium reserves present in the Battle Springs Formation at depths of approximately 2,500 to 3,500 feet below the surface of Green Mountain. Project-required lands encompass a maximum of 315 acres within portions of Townships 24 through 28 North, Ranges 91 through 93 West.

The proposed project involves the development of an underground uranium mine with a surface disturbance of approximately 42 acres within a Wyoming Department of Environmental Quality, Land Quality Division permit area. Standard procedures as used in underground mine developments throughout Wyoming and the surrounding region would be employed during project development. Activities conducted during project development, operation, and abandonment would comply with all applicable federal, state, and county laws, regulations, and stipulations. Uranium ore from the project would be transported from the mine site along upgraded and/or newly constructed roads linking the mine site with the existing Sweetwater Uranium Mill to the south.

The acreage required for the proposed project would be from the following:
- **Jackpot Mine Site Development** - 7 acres of new disturbance and 10 to 35 acres of new disturbance (the entire fenced mine site would occupy 118 acres);
- **Big Eagle Facilities and Pits** - 23 to 126 acres of existing surface disturbance; and
- **Access and Haul Roads** - 100 to 277 acres of existing disturbance; 171 to 269 acres of new disturbance, and 225 to 271 acres of life-of-project disturbance.

The maximum life-of-project area required for the proposed project would be 515 acres.

It is anticipated that underground uranium exploration and mine development would require from two to seven years, and the proposed life-of-project would require from 13 to 25 years. Mining and ore transport activities would be conducted on a 24-hour basis and require 3 crews. As many as 250 workers would be required during mining operations. Areas disturbed during road improvement and construction operations that are not required for the life-of-project would be reclaimed as soon as practical. When uranium reserves have been depleted, the mine portals would be plugged and the ground surface reconstructed and revegetated with the natural landscape. Also, surface structures would be removed, roads closed per landowner or BLM request, and disturbed areas reclaimed.

The proposed action, three alternative transportation routes, one mine waste rock disposal alternative, and the No Action Alternative are considered in this Environmental Impact Statement. Additional alternatives requiring alternate exploration procedures, mining methods, and mine development schedules were considered but rejected for environmental and/or economic reasons. The BLM preferred alternative for this project includes approval of the Plan of Operations for the underground mine (the Proposed Action) and disposal of mine waste rock at the Big Eagle Mine (Alternative D). A combination of the
reasons. The BLM preferred alternative for this project includes approval of the Plan of Operations for the underground mine (the Proposed Action) and disposal of mine waste rock at the Big Eagle Mine (Alternative D). A combination of the upgrading of existing roads (the Proposed Action) and construction of new haul road segments (Alternatives B and C) are selected as the preferred access/haul road. These roads would be subject to modifications in alignment necessary to minimize or avoid adverse impacts to riparian and cultural (both prehistoric and historic) resources. The modifications would also be based on considerations such as using existing disturbed areas where practical, landowner negotiations on non-federal lands, and a road design engineered to address safety, soil limitations, slope drainage, and the points of intersection with the Crooks Gap Wamsutter Road. All of the above factors would be utilized to select the final alignment.

The proposed project area has a continental, semi-arid, cold desert climate and lies primarily within portions of the Great Divide Basin. The mine site and northern portions of access and haul roads are located on the southern flanks of Green Mountain, and drainage from these areas is to Crooks Creek. Intermittent and ephemeral drainages along southern portions of the transportation corridors flow southwest to the Great Divide Basin. Groundwater and surface water are variable in quality, and the major current use is for livestock, wildlife, and recreation.

Project area soils have high rates of natural erosion, and plant cover values and productivity are variable. Vegetation is primarily a grassland/shrubland mosaic comprised of big sagebrush (Artemisia tridentata), upland grasses, saltbush (Atriplex spp.), and greasewood (Sarcobatus vermiculatus), scattered with barren areas associated with cliffs, badlands, and rock outcrops. Some trees occur along the southern flanks of Green Mountain. Range condition is generally good. Wetlands in the project area are restricted to drainage bottoms, around impoundments, and adjacent to Crooks Creek.

Elk, moose, pronghorn antelope, and mule deer are the big game species most commonly occurring on the area. Sage grouse leks and raptor nest areas occur adjacent to project-required lands, and monitoring would be conducted to determine the activity status of sage grouse leks and raptor nests proximal to proposed developments. Threatened and endangered species that may occur on the area include black-footed ferret, bald eagle, and peregrine falcon. The mountain plover, a Category 1 species for threatened and endangered listing, potentially occurs in the area.

Livestock grazing, wildlife habitat, and recreation are the predominant land uses in the project area. No developed recreation sites occur on the area; however, dispersed recreational activities such as big game hunting do occur. Project-required lands are in Visual Resource Management Class III (53 acres), Class IV (188 acres), and Class V (177 acres) areas.

Communities closest to the project area are Jeffrey City (14 miles northwest), Lander (70 miles northwest), Riverton (70 miles northwest), and Rawlins (80 miles southeast). Access to the project area is from Highway 135 to Jeffrey City and south along the Crooks Gap Wamsutter Road to the Big Eagle Haul Road, Anaconda Road, and Jackpot Mine Access Road.

Numerous standard, project-specific, and site-specific mitigation measures would be employed during all phases of the project to assure that potential impacts are minimized, and GMMV has committed to implementing all mitigation, monitoring, and environmental protection measures specified in this EIS, the Plan of Operations for this project, the WDEQ-LQD mine permit, and all other associated permits. For example, disturbance of sensitive areas (e.g., steep slopes, raptor nesting areas) would be avoided as much as possible, and construction activities would be authorized only during appropriate seasons. Surveys and subsequent monitoring would be conducted for cultural resources, paleontological resources, winter big game use, raptor nests, and sage grouse leks to document their status relative to disturbance activities. Reclamation would be conducted as soon as practical on areas disturbed during initial construction. Upon completion of the project, all surface facilities would be removed, and most disturbed areas would be reclaimed and revegetated.

Project impacts to paleontology, groundwater resources, odor, wetlands, wild horses, socioeconomics, livestock grazing, and visual resources are expected to be negligible. Moderate impacts involving geologic hazards, surface water resources, noise, vegetation, wildlife, and land use are expected due to project activities. Potential significant impacts resulting from the proposed project include fugitive dust emissions along project-required roads, the depletion of uranium reserves from the Battle Springs Formation, alteration of the No Name Drainage, temporary preclusion of oil and gas development, reactivation of stabilized sand dunes, and degradation of cultural/historic resources at Site 48FR479 and along the Rawlins-Fort Washakie Stage Road. Cumulative impacts from existing, proposed, and potential future developments in the area are not expected to exceed the impact levels identified for the proposed project. After the project is completed and the area reclaimed, there would be negligible impacts to the character of the area. No adverse effects are anticipated for threatened and endangered species. There would be beneficial project impacts associated with increased U.S. dependence on foreign energy sources, increased tax revenues, increased employment, and increased use of local goods and services.
This Final Environmental Impact Statement (FEIS) assesses the environmental consequences of a proposed uranium mine project in the Green Mountain area of southeastern Fremont and northeastern Sweetwater Counties, Wyoming, approximately 14 miles southeast of Jeffrey City. This document is not a complete reprinting of the Draft Environmental Impact Statement (DEIS) for the Jackpot Mine Project. It incorporates by reference most of the material presented therein and identifies changes in the DEIS required as a result of public and agency comment on the DEIS and further Bureau of Land Management (BLM) interdisciplinary team (IDT) environmental studies and analyses. The DEIS is required to accompany this document because only the modifications, corrections, and additions are provided herein. For ease of reference, inserts, deletions, and modifications to the DEIS are presented herein under the section numbers and headings, page number, column, paragraph, and line.
1.0 INTRODUCTION

Page 1-5, column 1, paragraph 1, line 6. After the last sentence, insert the sentence "GMMV would adhere to all mitigation, monitoring, and environmental protection requirements specified in this EIS, the BLM Plan of Operations for the project, the WDEQ-LQD Jackpot Mine Permit, and all other associated permits."

1.4 PUBLIC INVOLVEMENT, ISSUES AND CONCERNS, AND CONSULTATION

Page 1-10, column 1. After the first paragraph insert a new paragraph that reads: "The DEIS was made available to the U.S. Environmental Protection Agency (EPA) and the public on June 22, 1995, and a Notice of Availability was published in the Federal Register. Public meetings were held on July 18, 19, 20, and 24, 1995, and the public comment period for the DEIS closed on August 23, 1995. Comments on the DEIS and BLM responses are presented in Chapter 8.0."

Page 1-10, column 1, paragraph 2, line 1. After the word "scoping," insert the words "and review of the DEIS".

Page 1-11, column 2, paragraph 1. Insert additional bulleted items as follows:

• U.S. Fish and Wildlife Service (USFWS) review of riparian habitat enhancement and monitoring plans;
• USFWS review of Spill Prevention and Control Countermeasure Plans (SPCCP);
• USFWS involvement in ripoff mitigation plan development;
• black bear occurrence on Green Mountain;
• ore stockpiling at Big Eagle facilities site;
• use of netting on settling and detention ponds;
• ore-hauling restrictions during dry windy periods;
• mine and traffic light visibility in sensitive visual resource management areas;
• cost analysis for the Alternative A and BLM preferred haul routes;
• radiologic impacts from ore stockpiles and mine waste rock;
• socioeconomic impacts to Sweetwater County;
• need for work camps;
• Sweetwater County Engineer’s Office involvement in haul road development plans;
• triggers for potential acid generation mitigations;
• barium/radium sulfate precipitate impacts;
• use of car pools;
• impacts to an existing lease southeast of the proposed mine site; and
• alternative analyses involving the resumption of mining at the Big Eagle, Crooks Gap, Sheep Mountain, and Sweetwater Mines."

2.0 THE PROPOSED ACTION AND ALTERNATIVES

2.1 THE PROPOSED ACTION

Page 2-1, column 1, last paragraph, last line. After the last sentence insert the sentence "GMMV has committed to implementing all mitigation, monitoring, and environmental protection measures specified in this EIS, the BLM Plan of Operations for this project, the WDEQ-LQD Jackpot Mine Permit, and all other associated permits."

2.1.1 Project Overview

Page 2-1, column 2, paragraph 1, line 3. Replace words "develop known" with "explore for and develop".

Page 2-1, column 2, paragraph 1, last line. Add the sentence "Detailed maps showing proposed mine site design features, including topsoil and rock pile, pond, portal, and facility locations are provided in the Mine Plan section of GMMV’s mine permit application (GMMV 1994:Volume 1, Attachments), which is available for public review at the BLM Landner Resource Area and Rawlins District Offices."

2.1.2.1 Nature of the Ore and Ore Reserves

Page 2-4, column 1, paragraph 2, line 4. After the word "tons", insert "of U3O8."

2.1.2.5 Required Equipment and Facilities

Page 2-5, column 1, paragraph 3, line 6. Delete the words "is typical for underground mines and".

Page 2-7, column 1, first bullet, last line. After the word "operation.,” insert the following: "The ore stockpile area would be appropriately lined such that all runoff and leachate waters are contained."

2.1.2.7. Mine-water Discharge and Treatment

Page 2-8, column 2, paragraph 2, line 2. After the word "be", delete the word "over".

Page 2-9, column 1, paragraph 1, line 2. After the acronym "gpm" (gallons per minute), add the words "for approximately 178% of the expected maximum discharge rate of 732 gpm."

Page 2-9, column 1, paragraph 4, line 3. After the year "1994", add ":Volume 1a, Sections HY 15, HY 17, HY 19, and HY 20."

Page 2-9, column 2, paragraph 3, lines 1 and 2. Delete the words "potential elements of concern" and replace with the words "potential contaminants".

2.1.2.8 Water and Erosion Monitoring

Page 2-10, column 1, paragraph 4, line 5. After the year "1994", add ":Volume 1a, Sections HY 15, HY 17, HY 19, and HY 20."

Page 2-10, column 1, paragraph 4, line 11. After the year "1994", add ":Volume 1a, Figure HY 15.1."

Page 2-10, column 2, paragraph 2, line 4. After the year "1994", add ":Volume 1a, Sections HY 15, HY 17, HY 19, and HY 20, and Figures 15.1 and 15.2."

Page 2-10, column 2, paragraph 3, last line. After the last sentence, insert the following sentence "If the 732 gpm discharge trigger is exceeded, further NEPA analyses may be required as deemed appropriate by the BLM."

Page 2-12, column 1, paragraph 1, line 14. After the year "1994", add ":Volume 1a, Section HY 20.0."
Page 2-12, column 1, paragraph 3, line 18. After the last sentence of the paragraph add "The development of alternate mine-water discharge points may require further NEPA analysis and/or an amendment to the mine permit."

2.1.2.10 Acid Generation Potential

Page 2-13, column 1, paragraph 2, line 11. After the word "site", insert the following sentence: "The 63 samples analyzed for AGP were taken from proposed decline locations; within minable ore, low grade ore, and waste rock zones; waste material from the initial 300 feet of decline development; geologic material from the main and western open pits at the Big Eagle Mine; and waste material from the Big Eagle Mine."

2.1.2.12 Mine Access and Ore Transport

Page 2-14, column 1, paragraph 2, line 5. After the first sentence, insert the sentence "No haul road upgrades or construction would occur until GMMV determines that ore hauling to the Sweetwater Mill is necessary, a Notice to Proceed is issued by the BLM, and all necessary environmental clearances are completed."

2.1.3 Riparian Habitat Enhancement and Monitoring

Page 2-17, column 1, paragraph 2, line 11. After the year "1994", add "Volume 1a, Section HY 20.0."  
Page 2-17, column 1, paragraph 2, line 15. After the sentence ending "(e.g., grazing lessees)", insert the sentence "The riparian habitat enhancement and monitoring plan would be submitted to the USFWS for review."

Page 2-17, column 2, paragraph 3, line 10. After the last sentence, insert the sentence "The riparian habitat enhancement and monitoring plan would be submitted to the USFWS for review."

2.1.5 Reclamation

Page 2-18, column 2, paragraph 1, line 5. After the year "1994", add "Volume 1a, Reclamation Plan."

2.1.6 Applicant-committed Mitigation Measures

Page 2-21, column 1, item 17, line 13. After the last sentence, insert the sentence "Prior to any ground disturbance, the USFWS would be contacted to discuss development of a raptor mitigation plan.

Page 2-21, column 2, item 19, lines 18 and 21. On line 18 replace "one hour" with "four hours", and on line 21 replace "April 30" with "May 20."

Page 2-22, column 1, item 23. After item 23 insert new items as follows: "24. GMMV would implement an employee education program regarding WGF D rules and regulations for project-required lands, how disturbances affect wildlife, and appropriate actions to minimize wildlife-related disturbances. 25. No transportation corridor fencing potentially affecting big game migrations would be used for the proposed project, and during the winter, animal escape openings would be provided along project-required roads."

2.2.4 Alternative D - Mine Waste Rock Disposal at an Existing Big Eagle Pit

Page 2-23, column 2, paragraph 2, line 16. Replace the word "generation" with the word "drainage."

2.3 ALTERNATIVES CONSIDERED BUT REJECTED

Page 2-25, Table 2.6, column 2, line 22. Delete the bulleted item "No proven uranium resource reserves delineated at Big Eagle Mine" and insert the following: "No economically recoverable resources delineated at the Big Eagle Mine."

Page 2-25, Table 2.6, column 2, line 23. Delete the word "reserves" and replace with "resources", change the word "that" to "than", and after the number 0.1%", insert "UO.".

2.4 SUMMARY OF ENVIRONMENTAL IMPACTS

Page 2-35, Wetlands and Riparian Areas, column 6, line 3. Replace the number "5.9" with "2.6."

3.0 AFFECTED ENVIRONMENT

3.1.4 Soils

Page 3-14, column 1, paragraph 1, line 1. After the year "1994", add "Volume 2, Appendix D-7, Soils."

3.1.5.1 Surface Water

Page 3-14, column 1, paragraph 2, line 6. After the year "1994", add "Volume 4, Appendix D-6, Section 2.0."

Page 3-17, column 1, paragraph 2, line 4. After the year "1994", add "Volume 4, Appendix D-6, Section 2.0."

3.2.1.2 Wetlands and Riparian Habitats

Page 3-35, column 1, paragraph 1, line 4. After the year "1994", add "Volume 6, Appendix D.11, Wetlands."

3.2.2.5 Other Species

Page 3-45, column 2, paragraph 4, line 8. After the sentence ending "and bobcat.", add the sentence "Black bears are also known to occur on Green Mountain (personal communication, 1995, with Dan Heilig, Associate Director/Attorney, Wyoming Outdoor Council)."

3.4.2 Threatened and Endangered/Candidate Other Species of Concern

Page 3-48, column 2, paragraph 1. After the first paragraph, add a new paragraph as follows: "BLM guidance for T&E candidate, and other species of concern is specified in department manual 6840 - Special Status Species Management (BLM 1986c). BLM special status species objectives are to conserve T&E species and the ecosystems on which they depend, and to ensure that actions authorized on BLM administered lands do not contribute to the need to list any other special status species under the provisions of the Endangered Species Act."

Page 3-49, Table 3.13, columns 2 and 3, lines 19-21. Under "Loggerhead shrike", delete "Approximately 1 mile W of Crooks Gap Wamsutter Road, May 9, 1984" and replace with "Immediately adjacent to the Crooks Gap Wamsutter Road, June 25, 1993."

4.0 ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

Page 4-1, column 1, paragraph 1, last line. After the last sentence, insert the sentence "In addition, GMMV has committed to implementing all mitigation, monitoring, and environmental protection measures specified in this EIS, the BLM Plan of Operations for the project, the WDEQ-LQD Jackpot Mine Permit, and all other associated permits."

4.1.7.1 Significance Criteria

Page 4-21, column 2, paragraph 1, line 6. Delete the word "or".
GMMV Jackpot Mine Final EIS

Page 4-21, column 2, paragraph 1, line 9. Delete the "*" and insert "or".

Page 4-21, column 2, paragraph 1, end of paragraph. Add the bulleted item "*" project activities result in surface or groundwater quality degradation in violation of federal or state water quality regulations."

4.2.2.1 Significance Criteria

Page 4-31, column 1, paragraph 1, first line. After the word "wetlands", insert the following "*"; therefore, any net loss of wetlands resulting from the proposed project would be considered significant".

Page 4-31, column 1, paragraph 1, line 4. After the year "1994", add "*Volume Ia, Section HY 20.0'.

5.0 MITIGATION AND MONITORING

5.2.9 Vegetation

Page 5-7, column 2, paragraph 2, line 13. After the year "1994", add "*Volume Ia, Reclamation Plan".

Page 5-8, column 2, paragraph 2, line 12. After the last sentence, add the sentence "The riparian habitat enhancement and monitoring program would be submitted to the USFWS for review."

5.2.10 Wildlife and Fisheries

Page 5-9, column 1, paragraph 1, line 4. Delete the "*", and insert the clause "however, to ensure that big game migration routes are not blocked, no haul or access roads would be fenced.*

4.2.2.2 Proposed Action

Page 4-31, column 1, paragraph 3, line 9. After the year "1994", add "*Volume I, Section 2.e., Hydraulic Diversions."

4.2.2.6 Alternative D - Mine Waste Rock at an Existing Big Eagle Pit

Page 4-32, column 1, paragraph 3, lines 4 and 8. On line 4, replace the number "3.4" with "0.2", and on line 8, replace the number "5.9" with "2.6".

4.6.2 Proposed Action

Page 4-63, column 2, paragraph 3, line 3. After the first sentence, insert the sentence "Light from the mine site and from haul trucks and other traffic may be visible during the night in VRM Class II areas."

6.0 CONSULTATION AND PREPARERS

Pages 6-1 - 6-5, Table 6.1. Delete Table 6.1 and replace with the following revised table.

Table 6.1 Personnel Contacted or Consulted, GMMV Jackpot Mine Project, Fremont and Sweetwater Counties, Wyoming. 1995.

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<th>Agency or Organization</th>
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<th>Position</th>
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<tr>
<td>Advanced Sciences, Inc.</td>
<td>George Matthews</td>
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<td>Basic Oil of Wyoming, Inc.</td>
<td>Robert J. Clark</td>
<td>President</td>
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<td>Bureau of Land Management</td>
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<tr>
<td>Casper Office</td>
<td>Roger Miller</td>
<td>Geologist/Geohydrologist</td>
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<td>Great Divide Resource Area</td>
<td>John Ahlbrandt</td>
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<td>Rawlins District Office</td>
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<td>Planning and Environmental Specialist</td>
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<td></td>
<td>Brenda Vosika</td>
<td>Mining Engineer</td>
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6.0 CONSULTATION AND PREPARERS

Pages 6-1 - 6-5, Table 6.1. Delete Table 6.1 and replace with the following revised table.
Table 6.1 (Continued)

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<td>Jon Johnson</td>
<td>Natural Resource Specialist</td>
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<td></td>
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1 Individuals and private corporations not responding to scoping are not included. All government agencies are listed.

7.0 REFERENCES AND ABBREVIATIONS AND ACRONYMS

7.1 REFERENCES


7.2 ABBREVIATIONS AND ACRONYMS

Page 7-10. After the abbreviation "HCO," insert the following acronym: "HEC Habitat Enhancement Committee."

Page 7-11. After the abbreviation "ppm," insert the following acronym: "PRHEM Potential Riparian Habitat (Wetland) Enhancement Sites and Possibilities."

Page 7-11. After the acronym "RCRA," insert the following acronym: "RHEMP Riparian Habitat Enhancement and Monitoring Program."

APPENDIX B: RECLAMATION PLAN

1.0 OBJECTIVES AND GOALS

Page B-3, column 1, paragraph 1, lines 1-3. Delete the first sentence and replace with "All disturbed lands will be reclaimed to a condition equal to or greater than their highest previous use, as specified in the WDEQ-LQD Jackpot Mine Permit Application (GMMV 1994:Volume 1a, Reclamation Plan)."

4.1 FACILITY AND STRUCTURE

6.0 RECLAMATION SUCCESS

Page B-7, column 2, paragraph 4, lines 4-9. Delete sentence "An adequate reclamation bond is held by WDEQ-LQD and/or BLM to assure compliance with reclamation standards and will not be released until WDEQ-LQD and BLM are satisfied that reclamation goals and objectives have been met." and replace with the following sentences: "Reclamation Performance Bonds are in place for the License to Explore #179-LE ($361,085) and the proposed Jackpot Mine ($471,000), and the BLM currently believes these bonds to be adequate. These bond amounts are reviewed annually by the WDEQ and BLM and are adjusted to reflect costs of reclamation and any changes in scope of the reclamation. If, in the future, the BLM believes these bond amounts to be inadequate, they would require GMMV to post an additional bond. In addition, a reclamation bond for proposed activities that would occur off the WDEQ-LQD permit area would be established and obtained by the BLM prior to disturbance. The bonds would not be released until the WDEQ-LQD and the BLM are satisfied that reclamation goals and objectives have been met."
APPENDIX C

MITIGATION, MONITORING, AND ENVIRONMENTAL PROTECTION MEASURES ADAPTED FROM THE WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY LAND QUALITY DIVISION JACKPOT MINE PERMIT APPLICATION PACKAGE

Prepared for
Bureau of Land Management
Lander Resource Area
Rawlins District

By
TRC Mariah Associates Inc.
Laramie, Wyoming
MAI Project 1007

December 1995
TABLE OF CONTENTS

PREFACE .......................................................... C-6

VOLUME 1 .......................................................... C-7

SUBSIDENCE DUE TO MINING ........................................ C-7
2. a. ACCESS AND HAUL ROADS ..................................... C-7
SEDIMENT DAM AND BASIN .......................................... C-8
SANITARY TREATMENT PLANT ....................................... C-8
2. b. HYDRAULIC DIVERSIONS ....................................... C-8
2. b. MATERIAL STORAGE AND STOCKPILES ........................ C-9
3. b. TOPSOIL, MINE ROCK MANAGEMENT PLAN ..................... C-10
TOPSOIL CONSERVATION PLAN ...................................... C-11
MINE WATER TREATMENT ........................................... C-11
SOLID WASTE DISPOSAL ............................................ C-14
RECLAMATION ..................................................... C-16

7.0 SAMPLING PROGRAM DURING DECLINE DEVELOPMENT TO MONITOR ACID GENERATION POTENTIAL ......................... C-16
7.1 GENERAL ..................................................... C-16
7.2 SAMPLING MATERIAL ............................................ C-16
7.3 SAMPLE HANDLING ............................................. C-17
7.4 SAMPLE ANALYSIS .............................................. C-17
7.5 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES ......... C-17
7.6 REPORTING .................................................... C-18

VOLUME 1a .......................................................... C-19

HY 15.0 MONITORING OF GROUNDWATER EFFECTS .................... C-19
HY 15.1 POST-MINING GROUNDWATER MONITORING ................ C-22

HY 16.0 DISCHARGE OF MINE DRAINAGE ............................. C-22

HY 17.0 SURFACE WATER EFFECTS ................................ C-23
HY 17.1 MONITORING OF SURFACE WATER EFFECTS ................ C-24
HY 19.1.2 Duration of Pumping ................................... C-26
HY 19.3 RIPARIAN HABITAT ENHANCEMENT PROGRAM ................. C-26
HY 19.3.1 GMMV Worst Case Model ................................ C-27
HY 19.7 RIPARIAN GROUNDWATER MONITORING ..................... C-29

HY 20.0 RIPARIAN HABITAT ENHANCEMENT AND MONITORING PROGRAM FOR GMMV'S JACKPOT MINE ......................... C-29
INTRODUCTION .................................................. C-29
ENHANCEMENT PLAN ............................................... C-30
Type, Location, and Design of Wetlands ........................ C-31
Types and Potential Locations .................................... C-31

GMMV Jackpot Mine Final EIS

TABLE OF CONTENTS (Continued) .................................. C-3

Wetland Habitats Created ........................................ C-32
Other Considerations ............................................ C-32
Planning and Coordination Measures ............................. C-33
MONITORING PLAN ................................................ C-35
Measurement Parameters .......................................... C-36

HY 21.0 POTENTIAL RIPARIAN HABITAT (WETLAND) ENHANCEMENT SITES AND POSSIBILITIES FOR GMMV'S JACKPOT MINE .............. C-40
INTRODUCTION .................................................. C-40
SITE PLANS ..................................................... C-41

HY 22.0 HABITAT ENHANCEMENT COMMITTEE (HEC) ................ C-44
HY 22.1 ENHANCEMENT WATER RIGHTS ............................ C-45

MITIGATION ..................................................... C-45

1.0 INTRODUCTION ................................................. C-45

2.0 SUMMARY OF MITIGATION STRATEGIES ......................... C-46
2.1 RIPARIAN AREA ENHANCEMENT ................................ C-46
2.2 RIPARIAN MONITORING PRIOR TO MINING ..................... C-46
2.3 SUMMARY OF MITIGATION STRATEGIES ......................... C-47

3.0 WILDLIFE AND FISH ........................................... C-47
3.1 EMPLOYEE EDUCATION ......................................... C-47
3.2 FENCING .................................................... C-49
3.3 RAPTOR NESTS ................................................ C-49
3.4 SAGE GROUSE MONITORING ................................... C-49
3.5 THREATENED AND ENDANGERED SPECIES ....................... C-50
3.6 BLACK-FOOTED FERRETS ....................................... C-50
3.7 BIG GAME .................................................... C-50
3.8 FISH .......................................................... C-50

4.0 HABITAT AND RIPARIAN AREAS ................................ C-51

5.0 MINE SITE AND ASSOCIATED AREAS ............................. C-52
5.1 SOILS ........................................................ C-52

6.0 GROUNDWATER ................................................ C-52

7.0 SPRINGS AND SEEPS ........................................... C-53

8.0 STREAMFLOW EFFECTS ......................................... C-54

9.0 WATER QUALITY ................................................ C-55
TABLE OF CONTENTS (Continued)

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0 CHANNEL EROSION</td>
<td>C-55</td>
</tr>
<tr>
<td>11.0 ACID ROCK AND SOIL DISPOSAL</td>
<td>C-55</td>
</tr>
<tr>
<td>12.0 DRILLHOLES INTERCEPTED BY UNDERGROUND WORKINGS</td>
<td>C-56</td>
</tr>
<tr>
<td>13.0 CULTURAL SURVEY (ARCHAEOLOGY)</td>
<td>C-57</td>
</tr>
<tr>
<td>RECLAMATION PLAN</td>
<td>C-57</td>
</tr>
<tr>
<td>1.0 POSTMINING LAND USES</td>
<td>C-57</td>
</tr>
<tr>
<td>1.1 GENERAL RECLAMATION MEASURES</td>
<td>C-57</td>
</tr>
<tr>
<td>2.0 CONTOURING PLAN FOR AFFECTED LANDS</td>
<td>C-58</td>
</tr>
<tr>
<td>3.0 SURFACE PREPARATION: TOPSOIL AND SUBSOIL REPLACEMENT</td>
<td>C-58</td>
</tr>
<tr>
<td>3.1 TOPSOIL AND SUBSOIL PLACEMENT</td>
<td>C-58</td>
</tr>
<tr>
<td>3.2 REVEGETATION PRACTICES</td>
<td>C-58</td>
</tr>
<tr>
<td>3.2.1 Revegetation Plan</td>
<td>C-59</td>
</tr>
<tr>
<td>3.2.2 Seed Mixtures</td>
<td>C-59</td>
</tr>
<tr>
<td>3.2.3 Seeding Practices</td>
<td>C-60</td>
</tr>
<tr>
<td>3.2.4 Husbandry Practices</td>
<td>C-61</td>
</tr>
<tr>
<td>3.2.5 Postmining Grazing Practices</td>
<td>C-61</td>
</tr>
<tr>
<td>3.2.6 Restoration of Wildlife Habitat</td>
<td>C-61</td>
</tr>
<tr>
<td>3.2.7 Testing Adequacy of Reclamation</td>
<td>C-61</td>
</tr>
<tr>
<td>4.0 EVALUATION OF RECLAMATION SUCCESS</td>
<td>C-62</td>
</tr>
<tr>
<td>5.0 FINAL HYDROLOGICAL RESTORATION</td>
<td>C-62</td>
</tr>
<tr>
<td>5.1 DIVERSION DITCH</td>
<td>C-62</td>
</tr>
<tr>
<td>5.2 IMPOUNDMENTS</td>
<td>C-63</td>
</tr>
<tr>
<td>5.3 SEDIMENT DAM AND BASIN</td>
<td>C-63</td>
</tr>
<tr>
<td>6.0 POSTMINING GROUNDWATER AND SURFACE WATER MONITORING</td>
<td>C-63</td>
</tr>
<tr>
<td>7.0 SPECIAL RECLAMATION STANDARDS</td>
<td>C-63</td>
</tr>
<tr>
<td>7.1 FACILITIES AND UTILITIES</td>
<td>C-63</td>
</tr>
<tr>
<td>7.2 ROADS</td>
<td>C-64</td>
</tr>
<tr>
<td>7.3 MINE ROCK PILE (SITE FILL AREA)</td>
<td>C-64</td>
</tr>
<tr>
<td>7.4 MINE DECLINES AND OTHER SURFACE OPENINGS</td>
<td>C-65</td>
</tr>
<tr>
<td>7.5 LOW GRADE STOCKPILES</td>
<td>C-66</td>
</tr>
<tr>
<td>7.6 SLUDGE DISPOSAL</td>
<td>C-66</td>
</tr>
<tr>
<td>8.0 RECLAMATION OF MILL SITE</td>
<td>C-66</td>
</tr>
</tbody>
</table>
PREFACE

The following materials were adapted from the WDEQ-LQD, Jackpot Mine Permit Application Package (GMMV 1994). The format for Volume, Chapter, and Section in this appendix matches that of GMMV (1994) and, therefore, numbering may not be sequential since some permit application sections may not contain mitigation, monitoring, or environmental protection measures. This appendix has been included in the FEIS to provide further clarification on the extent and content of the environmental protection measures developed for this project.

SUBSIDENCE DUE TO MINING

Physical testing studies for ore and non-ore from the various potential mining horizons of the Jackpot Mine were conducted in 1991-92 (Abel 1992a). This comprehensive laboratory testing program has allowed the preliminary room and pillar mine designs to be made that will preclude surface subsidence. To assure no ground surface mining manifestation, Abel's (1992a) barrier and panel pillar design guidelines and columnation recommendations for mining overlapping horizons will be followed. It is anticipated that the Jackpot Mine room and pillar design could, at worst, result in localized long-term caving immediately above the openings; this predicted roof failure has been estimated to have a maximum collapse height of 100 feet (Abel 1992b [included in GMMV 1994:Volume 1, Attachment E]). This chimney-caving phenomenon could develop at some indeterminate time following mining and would not result in ground surface subsidence for the 2,300 to 3,400 feet mining depths of the Jackpot Mine.

References:  


2.b. ACCESS AND HAUL ROADS

Any road enlargements will be constructed under the BLM standards from BLM Manual, Section 9113. The improved roads will be sloped staked to show cuts and fills and total disturbance areas for widening prior to construction. Material for widening will come from the existing road bed, which will be lowered in elevation as required. Safety berms on the haulage road are not contemplated; however, if they are needed, openings will be provided at frequent intervals for erosion control. Drop structures will be installed as required, below openings in berms. Topsoil will be stockpiled along the road at selected locations and will be used for final reclamation (see GMMV 1994:Volume 1, Map M-2).

Access within the facilities area and the re-route around the mine site of the public road will be by the roads as shown on GMMV 1994:Volume 1, Map M-1. These roads will be used for regular daily movement of vehicles and equipment within the permit area. The re-route around the mine site for public
access will be staked prior to construction. The mine access, haul, and other roads associated with the mine activity will be maintained on a regular basis, and measures will be taken to minimize fugitive dust. Other on-site roads related to mine activities may be constructed to assist in the general operation of the mine, and will be maintained in a similar manner as mine access roads.

SEDIMENT DAM AND BASIN

The sediment basin associated with the mine rock pile will be constructed to capture all meteoric waters from the disturbed areas of the mine site and mine rock pile. The sediment dam will be located updrainage from 0.1 acre of riparian scrub (see GMMV 1994:Volume 6, Appendix D.11, Wetlands, and GMMV 1994:Volume 1, Map M-1). The sediment basin will be constructed to isolate the meteoric runoff from the disturbed areas and mine rock pile from any natural subsurface water zones. The sediment dam will be designed for zero discharge under normal operating conditions, but will have provision for discharging storm events providing the discharge water meets NPDES requirements. The sediment dam and basin will be designed and built to applicable standards. The affected areas associated with the basin and dam will be topsoiled and seeded where applicable.

SANITARY TREATMENT PLANT

At the Big Eagle facility, the existing sewage treatment system of septic tank(s) and drain field will be used. At the Jackpot Mine, all waste water from the surface facilities (office, warehouse, etc.) will be drained to a septic tank system and drain field (see GMMV 1994:Volume 1, Map M-1). Underground sanitary facilities will consist of portable toilets which will be pumped out at regular intervals. All waste from the underground sanitary units will be transported to the surface and disposed of in the septic system, or by other appropriate methods.

2.e. HYDRAULIC DIVERSIONS

Meteoric waters will be diverted from disturbed areas by the use of diversion ditches, culverts, and other appropriately engineered structures. The diversion ditches will have side slopes of 3:1 and be topsoiled and seeded. See GMMV 1994:Volume 1, Attachment D and Map M-1 for details of surface diversion systems.

Mine water from treatment ponds will be transported to Fourth Creek for discharge at the Primary Discharge Point 002 under the NPDES Permit No. WY-0033952. A second discharge point (001) is included in the NPDES Permit in the event the determination is made to discharge a portion of the mine water down No Name Creek. Energy dissipating structures for water discharge will be designed and sized for the maximum anticipated discharges. The details of the energy dissipating structures are included in the GMMV 1994:Volume 1, Mine Plan Attachment E. In addition, riprap may be installed in the steeper channel reaches to prevent erosion. Details of riprap are included in the GMMV 1994:Volume 1, Mine Plan Attachment E.

Waste products from the operation will be minimized through recycling of containers and materials to the fullest practical extent.

Waste products from the operation will be disposed of in an appropriate manner and in accordance with WDEQ Solid Waste Management Rules. The materials can be divided into the following broad categories:

1) Mine Rock - See GMMV 1994:Volume 1, Section 3(a)
2) Garbage (office and domestic type wastes)
3) Construction and Operating Debris (wood, metal scrap, cardboard, etc.)
4) Other Non-hazardous Materials
5) Hazardous Materials

2.h. MATERIAL STORAGE AND STOCKPILES

- Petroleum Fuel Products (diesel fuel/gasoline and other petroleum based products) - All petroleum fuel products will be stored in aboveground tanks having secondary containment, in accordance with applicable regulations. Storage may take the form of double-walled tankage or lined, bermed areas surrounding tankage. Bermed secondary containment areas will be sized to provide 150% capacity of the largest tank within or of the total volume of all tanks interconnected, in the event of system failure. The capacity of the fuel storage facilities will be in the range of: diesel fuel - 10,000 gallons; gasoline - 5,000 gallons; and other petroleum products - 20,000 gallons. The proposed location of these fuel storage facilities is shown on GMMV 1994:Volume 1, Map M-1.
The design and construction of the containment and storage facilities will be certified by a Professional Engineer.

- Chemicals - All chemicals at the mine site will be stored in a manner appropriate for the specific type of chemical. Secondary containment will be used as appropriate.

### 3.b. TOPSOIL, MINE ROCK MANAGEMENT PLAN

Topsoil and subsoil will only be disturbed as a result of construction of roads and surface facilities associated with the underground mine. All cut-and-fill slopes and other disturbed areas that will not be further disturbed by the operations will be blended into adjacent terrain, and will have topsoil placed prior to seeding.

Topsoil, subsoil, mine rock, and site grading spoil material were stockpiled on the surface at affected areas under the License to Explore 179LE. The material was moved by scrapers, dozers, and haulage trucks to stockpiles that are shown on GMMV 1994:Volume 1, Map M-1 and M-2. Any additional topsoil and subsoil stockpiling will be constructed from material stripped from the surface of affected areas. This material will be selected based on its future use in reclamation and soil assessments, as discussed in GMMV 1994:Volume 2, Appendix D.7. The volume of all topsoil-subsoil stockpiles will be about 144,000 cubic yards and will cover an overall area of about 8-10 acres. Each pile will have 3:1 (horizontal/vertical) side slopes and typically be at a height of approximately 20 feet.

The Mine Waste Rock will be hauled to the Big Eagle pits and contain material mostly from the mine workings, including access declines, exploration drifts, ventilation shafts and any other openings that require rock extraction (see GMMV 1994:Volume 1, Map M-1). A sediment dam and basin will be constructed below the mine rock pile (see GMMV 1994:Volume 1, Section 2.d., Sediment Dam and Basin). Topsoil and subsoil will be removed from the disturbed areas prior to deposition of any site overburden material. The mine site fill area in No Name Drainage will enable a mine surface working area of approximately 29 acres subject to final surface topographic configurations.

On final reclamation of the mine site area, material meeting prescribed limits of constituents will be used as surface overburden in accordance with regulations and recommendations as outlined in WDEQ Guideline 1 (1984). Suitable mine rock material will be stockpiled separately on the mine rock pile to be used in suitable cover to mitigate toxic and acid-forming materials, as well as to provide a radiological barrier in future reclamation activities (see GMMV 1994:Volume 1a, Reclamation Plan, Section 7.3, Mine Rock Pile).

### TOPSOIL CONSERVATION PLAN

All existing and future salvaged topsoil has been and will be stockpiled and protected from disturbance and contamination for future use. These stockpiles will be clearly identified with signs labeled "Topsoil". The project area is exposed to southwesterly winds which may cause some soil erosion. Topsoil stockpiles will be oriented with the prevailing wind direction as much as possible. In addition, slatted snow fence or other methods may be used, as needed, on or near topsoil storage piles to reduce wind erosion.

Topsoil stockpiles, all cut-and-fill slopes, and other disturbed areas except those receiving high traffic, will be blended into adjacent terrain and will be seeded with a mixture of annual and perennial species to promote rapid stabilization. The seed species mix will be as follows:

**Seed Mix for Temporary Disturbance Areas**

<table>
<thead>
<tr>
<th>Seed Mix</th>
<th>PLS/Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western wheatgrass</td>
<td>4.00</td>
</tr>
<tr>
<td>Slender wheatgrass</td>
<td>4.00</td>
</tr>
<tr>
<td>Streamsbank wheatgrass</td>
<td>4.00</td>
</tr>
<tr>
<td>Wild blue flax</td>
<td>0.25</td>
</tr>
<tr>
<td>Winter wheat</td>
<td>20.00</td>
</tr>
<tr>
<td>Total</td>
<td>32.25</td>
</tr>
</tbody>
</table>

* Pounds live seed per acre.

### MINE WATER TREATMENT SYSTEM

The clarified water from Pond No. 1 (see GMMV 1994:Volume 1, Map M-1) will be treated, if necessary, to remove uranium prior to discharge. The removal of the uranium, if required to meet discharge standards, will be accomplished by an ion exchange unit. Since this unit's primary purpose is the treatment of mine water to meet NPDES standards prior to discharge and eluates of yellowcake...
slurry will not be produced on site, an NRC license or license amendment to the Sweetwater Uranium Project Source Material License for the unit at the Jackpot Mine will not be required.

An amendment to the Sweetwater Uranium Project's Source Material License (SUA-1350) will be required for eluting and/or cleaning/regenerating the resins. This activity will be conducted within the Sweetwater Uranium Project NRC Restricted Area.

The IX unit will consist of several skid-mounted, closed vessels filled with ion exchange resin, which will be operated in either an up- or downflow mode, as dictated by the clarity of the water entering the system and other factors. When the resin in a column is loaded, either the entire column containing the loaded resin will be disconnected from the system and placed on a truck or the loaded resin will be pumped out of the column into a tank mounted on a trailer or a loaded resin-holding tank until a trailer-mounted tank is available. The disconnected column or the resin-filled trailer-mounted tank will be transported to the Sweetwater Mill, where the resin will be eluted and, if necessary, cleaned and/or regenerated.

Upon completion of the elution and/or cleaning/regeneration step, the column or trailer containing the eluted resin will be transported back to the Jackpot Mine. If a detachable column is used, the column will be replaced on the skid and reconnected. If the resin is merely pumped out, it will be pumped back into a column or into a clean resin-holding tank until an empty column is available.

This system will preclude the concentration of uranium as eluates or slurry at the Jackpot Mine. Only resin will be present at the mine site. The concentration of uranium from the loaded resin will be done only at the NRC-licensed Sweetwater Mill. This system will minimize employee training and radiological exposure, and environmental related issues at the Jackpot Mine.

Radium 226 removal will be accomplished by the addition of barium chloride (BaCl₂) to form an insoluble precipitate of barium sulfate with which Radium 226 co-precipitates. The water will then flow to a lined pond (Pond No. 2) (GMMV 1994:Volume 1, Map M-1) for settling out of the precipitated barium-radium sulfate. The retention pond will be sized to allow for adequate precipitation of the barium-radium sulfate.

Ponds No. 1 and No. 2 will be initially designed and constructed for 1,300 gallons per minute (gpm) (though the current estimated mine discharge is only 470 gpm). The design criteria and location are shown on GMMV 1994:Volume 1, Map M-1 and in detail in Attachments A and B. Additional facilities will be added, if needed, for larger mine water flows. Pond No. 3 and then Pond No. 4, if needed, would be constructed in areas generally illustrated on Map M-1. All ponds will be protected from access by animals by a game fence. Separate permitting processes will be pursued with the WDEQ-LQD and State Engineer's Office for the construction of the ponds.

The ion exchange unit at the Jackpot Mine will not require an NRC license. The primary objective of the plant is treatment of mine discharge water to meet NPDES requirements. As such, the barium chloride sludges are not byproduct material and thus are not under NRC jurisdiction. The definition of byproduct material (10 CFR 40.4(a-i)) is as follows:

(a-i) "Byproduct Material" means the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes. Underground ore bodies depleted by such solution extraction operations do not constitute "byproduct material" within this definition.

Since the barium chloride sludges are not derived from processing the water primarily for its source material content, they are not byproduct material. The sludge disposal from impoundments will be isolated from groundwater. The final area of disposition will dictate the handling and placement requirements.

Final sludge disposal may include material being:

- taken to the uranium processing facility and run through the process or deposited directly into the tailings facility;
- taken to underground mine workings;
- taken to the Big Eagle pit and buried in the spoil pile 20 feet or more above groundwater and covered with a minimum of 4 feet of suitable material; or
- buried in place.
The spent ion exchange resins can, upon obtaining a license amendment to the Sweetwater Uranium Project Source Material License (SUA-1350), be placed for disposal in the tailings impoundment or processed through the mill as ore for final extraction of any contained uranium.

SOLID WASTE DISPOSAL

The plan for the management and disposal of all industrial solid wastes generated by mining operations within the proposed permit area shall be in accordance with the Solid Waste Disposal Chapters in the WDEQ-LQD Rules and Regulations and any related rule changes.

The disposal areas will be located in the existing Big Eagle No. 451 Permit area as shown on the Solid Waste Map (GMMV 1994:Volume 1, Attachments).

The plan is to deposit all mine-related wastes such as garbage, trash, discarded mining machinery, lumber, metal, and other materials generally used in mine-related activity into trenches constructed in the landfill area.

Petroleum-contaminated soils and similar petroleum-related waste products will be disposed of at the Big Eagle Mine in accordance with the Disposal Plan developed in the Big Eagle Interim Stabilization Plan, dated August 25, 1992.

The landowners in the landfill area are Kennecott Uranium Company and U.S. Energy Corp./Crested Corp. and the legal description of the Big Eagle Permit Area is shown on the Solid Waste Map (GMMV 1994:Volume 1, Attachments).

The disposal site locations meet all Location Standards For Sites Located Within A Land Quality Division Mine Permit Boundary as specified in Section 3 of Chapter XIV of the Solid Waste Disposal Rules and Regulations.

There is no known information to the applicant that would limit the site suitability for solid waste disposal.

The exact amount of waste generated on a daily, weekly, and monthly basis is not known at this time; however, it is estimated to be an average of 20 cubic yards per week. This would require one trench 20 feet wide, 10 feet deep, and 140 feet long each year of operation. The surveyed location of the trenches within the landfill area will be furnished prior to use and reported in the Annual Reports to the WDEQ. All waste will be covered with suitable soil weekly or on an as-needed basis. The refuse will be confined to the smallest practical area and will be deposited at the toe of the working face in a manner to control wind-blown materials. The landfill area is located within the mine waste rock pile, within the outline of a previously mined pit, and over an area where groundwater has been exposed to mining activity.

The existing waste petroleum impoundment and the landfill area are located a minimum of 20 feet above the predicted postmining potentiometric surface. The existing waste petroleum impoundment is separated from the groundwater by a bentonite liner. Groundwater levels and quality are monitored as a requirement of the Big Eagle Permit 451. This monitoring and the monitoring required for the Interim Stabilization Plan related thereto will continue until reclamation is completed and bond is released for Permit 451 by the WDEQ.

Signs will be posted at each disposal site. The signs will be identified with the following:

PETROLEUM CONTAMINATED SOIL DISPOSAL AREA
--NO SMOKING--
Approval Must Be Obtained Prior to Dumping

SOLID MINE WASTE DISPOSAL AREA
Approval Must Be Obtained Prior to Dumping

Hazardous wastes, as defined in Chapter II Section 1(c) of the WDEQ Hazardous Waste Management Rules and Regulations, will not be disposed of within the boundaries of the mine permits.
RECLAMATION

Reclamation of the disposal sites will be completed in conjunction with the requirements of the Reclamation Plan for the Big Eagle Mine Permit No. 451. The areas will be covered with a minimum of 4 feet of suitable cover, topsoiled, and revegetated to stabilize the disposal site surface and graded topographically to divert surface waters to reduce the potential for leachate generation.

7.0 SAMPLING PROGRAM DURING DECLINE DEVELOPMENT TO MONITOR ACID GENERATION POTENTIAL

7.1 GENERAL

The sampling and analysis program proposed during the development of the decline will be similar to and consistent with the program described in this report. This program will allow the data collected during the development phase of the project to be compared directly with the predictions made from sampling and analysis of drillcore in the pre-development AGP testing program, described in GMMV 1994: Volume I, Attachment 9, Sections 1 through 5.

The waste material produced by the roadheader (used to drive the decline) will be of a relatively small particle size when compared with typical waste rock, and will be potentially a mixture of lithological units (e.g., conglomerate and sandstone mixture). As this is precisely the nature and form of the waste to be placed in the waste management facility, sampling the roadheader cuttings provides an excellent opportunity to assess the materials from the decline routed to waste facilities.

7.2 SAMPLING MATERIAL

Accordingly, it is proposed to take a sample of roadheader cuttings approximately every 100 feet during the development of the decline. With an anticipated length of decline of about 12,000 linear feet, this will yield approximately 120 samples for analysis.

7.3 SAMPLE HANDLING

Samples will be handled in a similar manner to that described in GMMV 1994: Volume I, Attachment 9, Section 4.2, in terms of double bagging and sealing. Documentation of samples will be similar to that given in GMMV 1994: Volume I, Attachment 9, Section 4.3, modified to record distance along the decline development and vertical elevation, to allow correlation with drillhole logs from holes JP1 through JP6, described earlier.

All samples will be shipped to Core Laboratories, Casper, Wyoming, under the chain-of-custody procedures noted in GMMV 1994: Volume I, Attachment 9, Section 4.3, once a sufficient number of samples has been collected to make up an analytical batch.

7.4 SAMPLE ANALYSIS

The initial waste rock analytical data, described in GMMV 1994: Volume I, Attachment 9, Section 6, suggest that the majority, if not all, of the total sulphur in the Jackpot Mine waste rock is as sulphate and that sulphides, which are the potential source of acidity in the waste rock, are essentially absent. Accordingly, it is appropriate to analyze future decline development samples for sulphide sulphur, along with total sulphur and acid neutralization potential, as described in GMMV 1994: Volume I, Attachment 9, Section 5.2. It is not anticipated that any sample preparation will be required prior to analysis.

7.5 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

In addition to the internal Quality Assurance/Quality Control procedures used by Core Laboratories, approximately 10% of the waste samples collected from the decline development will be analyzed in duplicate (i.e., a total of about 12 samples). Duplicate samples for analysis will be selected at random by Core Laboratories.
7.6 REPORTING

A report will be prepared which details sample collection and handling procedures, analytical protocols, and an evaluation of the analytical data in terms of the propensity of waste materials from the Jackpot Mine decline development for acid generation. The data will be compared to those developed during the premining phase, as described in this and subsequent reports.

VOLUME 1a

HY 15.0 MONITORING OF GROUNDWATER EFFECTS

A monitoring plan for evaluating groundwater effects has been prepared. The plan is summarized in Figure HY 15.1, and monitoring point locations are shown in GMMV 1994: Volume 1a, Figure HY 1.1 (Figure HY 15.2 gives WDEQ 1990 Guideline 8 monitoring parameters). All monitoring will be in accordance with the schedule contained in the permit and will continue until a permit revision is approved by the WDEQ-LQD.

In order to better evaluate mine drainage effects, pumpage from the mine and declines will be monitored using a totalizing flow meter.

Wells have been, or will be, installed to monitor:

- the shallow water table on the mountain top (JP21, 23, 25, 27, 29, 31);
- aquifer systems about the portal and declines (JP17, 18, water well);
- intermediate depth groundwater systems (JP14s, 22, 24, 26, 28, 30, 32);
- deeper groundwater systems (JP1, 2, 3, 4, 5, 7, 14); and
- drainage line alluvium (JP19, JP20, PZ1-PZ8 and PZ series yet to be installed).

These wells will be monitored monthly for the first year after the start of decline construction.

Additional shallow wells (the PZ series described in GMMV 1994:Volume 1a, Figure HY 19.2), will be constructed in pairs to monitor potential effects on riparian areas. The downstream wells will be placed to intersect the water table at about 10 or 15 feet below the stream channel elevation. The upstream wells will be place to intersect the water table at an elevation between 100 and 150 feet below the stream channel. All the wells will be constructed as piezometers which intersect water-bearing zones. Water levels will be measured and recorded quarterly during mining.

The purpose of the wells will be to provide information on the extent of drawdowns which might impact surface springs and seeps. Should monitoring data show water levels dropping more than 5 feet below
### Monitoring Schedule

*See GMMV 1994: Volume 1a, Figure HY 1.1 for locations*

<table>
<thead>
<tr>
<th>Location</th>
<th>Pathway</th>
<th>Type</th>
<th>Frequency</th>
<th>Parameter</th>
<th>Type</th>
<th>Frequency</th>
<th>General Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC-2</td>
<td>Surface Water</td>
<td>Flow</td>
<td>Quarterly</td>
<td>Guideline 8</td>
<td></td>
<td></td>
<td>At Parshall Flume 30 x 24 inches</td>
</tr>
<tr>
<td>S-1</td>
<td>Surface Water</td>
<td>Flow</td>
<td>Quarterly</td>
<td>Guideline 8</td>
<td></td>
<td></td>
<td>At Parshall Flume 18 x 15 inches</td>
</tr>
<tr>
<td>F-9</td>
<td>Surface Water</td>
<td>Flow</td>
<td>Quarterly</td>
<td>Guideline 8</td>
<td></td>
<td></td>
<td>On Fourth Creek at Crooks Creek Junction</td>
</tr>
<tr>
<td>C-1</td>
<td>Surface Water</td>
<td>Flow</td>
<td>Quarterly</td>
<td>Guideline 8</td>
<td></td>
<td></td>
<td>Crooks Creek upstream from Fourth Creek</td>
</tr>
<tr>
<td>C-2</td>
<td>Surface Water</td>
<td>Flow</td>
<td>Quarterly</td>
<td>Guideline 8</td>
<td></td>
<td></td>
<td>Crooks Creek downstream from Fourth Creek</td>
</tr>
<tr>
<td>N-4</td>
<td>Surface (seep)</td>
<td>Flow</td>
<td>Quarterly</td>
<td>Guideline 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EC-2, WC-2</td>
<td>Surface Water</td>
<td>Flow</td>
<td>Aug., Sept., Oct. each year</td>
<td>Guideline 8</td>
<td></td>
<td>At road culvert</td>
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</tr>
<tr>
<td>WCK-1</td>
<td>Surface Water</td>
<td>Flow</td>
<td>Aug., Sept., Oct. each year</td>
<td>Guideline 8</td>
<td></td>
<td>At Parshall Flume 30 x 24 inches</td>
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<tr>
<td>001</td>
<td>Mine Water</td>
<td>Grab</td>
<td>Sept. each year</td>
<td>Guideline 8</td>
<td>Grab</td>
<td>Sept. each year</td>
<td>Continuous, with recording device</td>
</tr>
<tr>
<td>002</td>
<td></td>
<td>Weekly</td>
<td></td>
<td>Tss; oil and grease, visual</td>
<td>Grab</td>
<td>Monthly</td>
<td>Oil and grease</td>
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<td></td>
<td>Dna Ra 226; Tot-U</td>
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<td></td>
<td>Tot-Zn; pH</td>
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</tr>
<tr>
<td>X-1</td>
<td>Surface Water</td>
<td>Flow</td>
<td>Aug., Sept., Oct. each year</td>
<td>Guideline 8</td>
<td></td>
<td>Monitor and maintain record</td>
<td></td>
</tr>
<tr>
<td>X-2</td>
<td>Surface Water</td>
<td>Flow</td>
<td>Aug., Sept., Oct. each year</td>
<td>Guideline 8</td>
<td></td>
<td>Monitor and maintain record</td>
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</tr>
<tr>
<td>X-3</td>
<td>Surface Water</td>
<td>Flow</td>
<td>Aug., Sept., Oct. each year</td>
<td>Guideline 8</td>
<td></td>
<td>Monitor and maintain record</td>
<td></td>
</tr>
<tr>
<td>F-2, F-10</td>
<td>Surface Water</td>
<td>Flow</td>
<td>Aug., Sept., Oct. each year</td>
<td>Guideline 8</td>
<td></td>
<td>Monitor and maintain record</td>
<td></td>
</tr>
<tr>
<td>X-4 to X-7</td>
<td>Surface Water</td>
<td>Flow</td>
<td>Aug., Sept., Oct. each year</td>
<td>Guideline 8</td>
<td></td>
<td>Monitor and maintain record</td>
<td></td>
</tr>
<tr>
<td>JP1 to 5</td>
<td>Groundwater</td>
<td>Bail/Pump</td>
<td>Semi-annual (First Year)</td>
<td>Guideline 8</td>
<td>Level</td>
<td>Monthly (first year)</td>
<td>Monitor and maintain record</td>
</tr>
<tr>
<td>JP7</td>
<td></td>
<td></td>
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<tr>
<td>JP14 and 14a</td>
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<td>JP17 to 32</td>
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<tr>
<td>PZ1 to PZ8 Wells</td>
<td>Groundwater</td>
<td>Bail/Pump</td>
<td>Semi-annual (First Year)</td>
<td>Guideline 8</td>
<td>Level</td>
<td>Monthly (first year)</td>
<td>Monitor and maintain record</td>
</tr>
<tr>
<td>TW-5</td>
<td>Groundwater</td>
<td>Bail/Pump</td>
<td>Semi-annual (First Year)</td>
<td>Guideline 8</td>
<td></td>
<td>Monitor and maintain record</td>
<td></td>
</tr>
<tr>
<td>Water Well</td>
<td>Groundwater</td>
<td>Bail/Pump</td>
<td>Semi-annual (First Year)</td>
<td>Guideline 8</td>
<td></td>
<td>Monitor and maintain record</td>
<td></td>
</tr>
<tr>
<td>T-2</td>
<td>Erosion Transect</td>
<td>Measure top of bar to base</td>
<td>Quarterly</td>
<td>On Fourth Creek</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-3</td>
<td>Erosion Transect</td>
<td>Measure top of bar to base</td>
<td>Quarterly</td>
<td>On Fourth Creek</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-4</td>
<td>Erosion Transect</td>
<td>Measure top of bar to base</td>
<td>Quarterly</td>
<td>On No Name Creek</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PZ9 to PZ22 Wells</td>
<td>Riparian</td>
<td>Measure top of bar to base</td>
<td>Level</td>
<td>Monthly (first year)</td>
<td>Monitor and maintain record</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure HY 15.1 Monitoring Schedule.

For a complete list of Guideline 8 parameters, see HY 15.2.
WATER QUALITY MONITORING DETERMINANTS
(From WDEQ 1990, Guideline No. 8)

Ammonia
Nitrate + Nitrite

Bicarbonate
Carbonate
Boron
Chloride
Fluoride
Sulfate
TDS
pH
Arsenic
Cadmium
Chromium
Iron
Magnesium
Manganese
Molybdenum
Potassium
Selenium
Sodium
Zinc
Radium-226
Radium-228
Gross Alpha
Gross Beta
Uranium
Vanadium

Additional surface water analyses
Dissolved oxygen, TSS, turbidity

Figure HY 15.2  Water Quality Monitoring Determinants.

the lowest baseline levels, the WDEQ and WGFD will be notified and proposals made for appropriate detailed investigation into the causes of such changes.

Water quality will be measured twice yearly during the first year of operations, and the data will be reviewed at the end of that year. The mine will create a hydrologic sink, and accordingly, will not impact groundwater quality. Nevertheless it is considered desirable that monitoring of groundwater quality be conducted.

Annual submittals of underground water monitoring data will include graphical depictions of water levels and water quality in each zone clearly showing long-term trends. The lowest base-line levels and threshold values will be indicated on all submittals.

HY 15.1 POST-MINING GROUNDWATER MONITORING

Groundwater monitoring will be continued throughout the project and beyond to the end of the reclamation bond period.

HY 16.0 DISCHARGE OF MINE DRAINAGE

Discharge of mine drainage, at an estimated rate of 470 to 732 gpm (GMMV Best and Maximum flow estimates) or 1.05 to 1.63 cfs, will be to Fourth Creek. The channel has intermittent flow estimated to be 1-2 cfs in the maximum flow zones. The channel width is 1-3 feet and is incised to as much as 10 feet in the upper reaches. Estimated peak flows are given in Table HY 16.1 (GMMV 1994:Volume 4, Appendix D.6).

The proposed discharge is less than the 2-year 6-hour flood and is significantly less than the 2-year 24-hour storm. The channel should accordingly be in equilibrium with flow rates greater than the proposed discharge, and no additional erosion effects are anticipated. Similarly, no erosion is likely in the lower drainages that Fourth Creek flows into, including Crooks Creek.
Table HY 16.1 Estimated Peak Flows (cfs) for Fourth Creek.

<table>
<thead>
<tr>
<th></th>
<th>2 years</th>
<th>10 years</th>
<th>25 years</th>
<th>50 years</th>
<th>100 years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Premining</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-hour duration</td>
<td>1.6</td>
<td>8.5</td>
<td>20.0</td>
<td>35.5</td>
<td></td>
</tr>
<tr>
<td>6-hour duration</td>
<td>1.2</td>
<td>10.6</td>
<td>20.7</td>
<td>29.8</td>
<td>40.6</td>
</tr>
<tr>
<td>24-hour duration</td>
<td>8.6</td>
<td>37.0</td>
<td>65.9</td>
<td>101.8</td>
<td>121.8</td>
</tr>
<tr>
<td><strong>Mining</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-hour duration</td>
<td>2.7</td>
<td>9.6</td>
<td>21.1</td>
<td>36.6</td>
<td></td>
</tr>
<tr>
<td>6-hour duration</td>
<td>2.3</td>
<td>11.7</td>
<td>21.8</td>
<td>30.9</td>
<td>41.7</td>
</tr>
<tr>
<td></td>
<td>to 3.2</td>
<td>to 10.1</td>
<td>to 21.6</td>
<td>to 37.1</td>
<td></td>
</tr>
<tr>
<td>24-hour duration</td>
<td>9.7</td>
<td>38.1</td>
<td>67.0</td>
<td>102.9</td>
<td>122.9</td>
</tr>
<tr>
<td></td>
<td>to 10.2</td>
<td>to 38.6</td>
<td>to 67.5</td>
<td>to 103.4</td>
<td>to 123.4</td>
</tr>
</tbody>
</table>

HY 17.0 SURFACE WATER EFFECTS

Before discharge, the water will be treated as necessary to bring the water into compliance with NPDES quality parameters. No adverse water quality effects are foreseen.

Erosion transects have been installed in accordance with instructions from WDEQ-LQD's Lander office at locations on Fourth and No Name Creeks. The transect locations are noted on Figure HY 15.1. The transects consist of a series of iron stakes located along a line normal to the channel axes and driven deep into the sides and bottom of the channel. The relative elevations and height of the top of the stakes above ground level have been measured and recorded as baseline values (GMMV 1994:Volume 2, Appendix C). The distances from the top of the stake to ground level will be measured quarterly on all stakes on all transects.

HY 17.1 MONITORING OF SURFACE WATER EFFECTS

A surface water monitoring plan has been devised to measure surface water effects. Figure HY 15.1 lists the monitoring schedule. Figure HY 1.1 in GMMV 1994:Volume 1a shows the location of the monitoring points.

All water sampling operations will be performed in accordance with WDEQ-LQD Guideline 8, Appendix 2 (WDEQ 1980/Rev.3). A chain of custody record will be kept using the form shown on GMMV 1994:Volume 1a, Figure HY 17.1. A bound field notebook will be kept in which the information listed on GMMV 1994:Volume 1a, Figure HY 17.2 will be noted. Each sample container will be labeled with a log number which will correspond to the log number listed in the field notebook. All samples will be analyzed using EPA approved methods according to 40 CFR 135 (as amended). An EPA certified laboratory will perform the analyses. Any sample collection, preservation, or analysis protocols which WDEQ-LQD uniformly requires of all similar mines in Wyoming will be followed.

During mining, flow volumes in East Cottonwood Creek and the West Fork of Middle Cottonwood Creek on the north side of Green Mountain will be monitored each year for the three consecutive months of August, September, and October. These months were chosen as the time when total stream flow approaches base flow. Base flow is the portion of a stream's flow contributed by springs, seeps, and other groundwater sources. The purpose of the monitoring will be to determine whether mining activities are impacting spring flow. The monitoring locations will be at the road culvert in the SE 1/4, NE 1/4, Section 22, T28N, R91W (EC-2 on Figure HY 15.1) and at a parshall flume in the SW 1/4, NW 1/4, Section 21, T28N, R91W (WC-2 on Figure HY 15.1).

One sample will be taken at the monitoring stations EC-2 and WC-2 in September of each year. The samples will be analyzed for the components listed in WDEQ-LQD Guideline 8. The purpose of the monitoring will be to determine whether chemical data show groundwater drawdowns are impacting spring flows.

Flows discharged into Fourth Creek will be monitored per NPDES requirements for water quality at discharge point 002 on Figure HY 15.1. A continuous recording device will be installed at this point to measure water flow. Additionally, flows will be monitored quarterly for water quality and quantity at discharge point 002 on Figure HY 15.1.
point N-4; for quality at points C-1 and C-2; and quantity at points CC-2, S-1, and F-9. Flow monitoring of mine discharge will be for the purpose of evaluating actual versus predicted mine discharge. The purpose of other flow monitoring will be to accumulate data for reports to be made to WDEQ. The purpose of the water quality monitoring will be to evaluate any potential effects to surface waters from mining activities.

Flows in unnamed gullies within one mile of the decline portal will be monitored for quantity at points marked X-1, -2, -3, -4, and -5 and at the point marked F2 (Figure HY 15.1). During 1989, these stream courses were mostly dry (GMMV 1994:Volume 4, Appendix 0.6).

The erosional transects on Fourth Creek and No Name Creek will be monitored quarterly. It is expected that up to about 470 gpm will be discharged into Fourth Creek. The condition of the drainages of Fourth and No Name Creeks will be monitored quarterly at transects T-3 and T-4 (GMMY 1994:Volume 1a, Figure HY 1.1) where their channels cross the dune sands. Annual submittals of surface water monitoring data will include graphical depictions of water levels and water quality in each zone clearly showing long-term trends. The base-line levels and threshold values will be indicated on all submittals.

Mine water discharge quality will be monitored and treated as necessary to comply with NPDES permit requirements.

The PZ series of monitor wells (Figure HY 15.1) is designed to show whether or not drawdowns around the portal and decline are capable of adversely affecting wetlands in nearby drainages. Should spring flow, streams, seeps, or wetlands show an impact due to drawdowns caused by mining, remedial measures will be proposed by the GMMV, as outlined in the Mitigation Section of the Mine Plan (GMMV 1994:Volume 1a, Mitigation).

Where continuous recording gages or flumes are installed to measure surface water flow, the facilities will be inspected weekly to assure that they are operational. Any repairs needed will be made immediately upon noting a problem. Equipment installed for periodic measurement of flows will be repaired as necessary to assure valid measurements.

All monitoring will be in accordance with the schedules contained in the permit and continue until a permit revision is approved by the WDEQ-LQD.

**HY 19.1.2 Duration of Pumping**

To allow for a conservative approach in calculating the drawdown area of influence, the permittee is recommending that an additional 6 years be added to the pumpage time to allow for delays in the actual startup of mining due to the price of uranium.

The above would result in the following years of pumping:

1. Underground exploration 2 years
2. Construction of mine 2 years
3. Extraction of ore 15 years
4. Additional for standby period 6 years
5. Reclamation No pumping 25 years

During the exploration phase, studies may be undertaken by flooding various areas to evaluate if dewatering could be suspended during any standby period.

**HY 19.3 RIFARIAN HABITAT ENHANCEMENT PROGRAM**

A Habitat Enhancement Committee (HEC) has been formed which includes representatives from the BLM, WDEQ, WGF-D and the Permittee to determine specific type and locations of habitat enhancement sites. The sites have not been determined by the HEC at this time. Each site will have specific monitoring criteria which will be developed in concert with the HEC and will be submitted for insertion into the permit upon determination. The enhancement and monitoring program, which is included in the Hydrological Effects of Mining Section, detailed in GMMV 1994:Volume 1a, HY 20.0 and HY 21.0, addresses the following issues:
the possible effects of the so called "worst case" scenario of mine dewatering and the WDEQ's concerns as to the effect such a case may have on the availability of water for wildlife and livestock use and maintenance of riparian habitat; and

the conditions that would "trigger" the onset of the applicable studies by the GMMV.

Prior to the start of mining, or concurrent with it, the GMMV proposes to:

- establish a detailed monitoring program for riparian habitat areas that includes the use of reference areas both on and off Green Mountain and of the riparian habitat areas that the WDEQ believes could potentially be affected by mine dewatering;

- enhance, as part of the mine operations, existing habitat riparian areas to essentially "pre-mitigate" any effect the mine dewatering may have;

- install additional shallow groundwater monitoring sites at locations illustrated on the GMMV 1994: Volume 1a, Hypothetical Drawdown Map, Figure HY 19.2. (This will ensure that early warning of any impact will be obtained, and if such impacts are observed allow for the timely expansion of the monitoring program.); and

- install additional shallow and intermediate depth monitoring wells near Crooks Creek to provide monitoring for spread of impact through the deeper systems.

Realizing that riparian habitat areas are dynamic in nature by their very character, any mitigation and pre-mitigation measures subsequently implemented are intended to be of a permanent nature. The design of any mitigation areas will be such that the life of the structures are sufficient to last until the hydrological system has renewed to a point at which it will naturally be self-sustaining.

**HY 19.3.1 GMMV Worst Case Model**

The GMMV’s original "worst case" scenario as presented in GMMV 1994: Volume 8 and revised herein, and in GMMV 1994: Volume 1a, Hydrological Effects of Mining, is based on the following factors:

- mine dewatering at a maximum rate of 732 gpm;

- mine pumping at this rate for 25 years; and

- assumed recharge of 1 to 2 inches/year.

Based on these parameters, the GMMV has determined that mine dewatering will not impact the shallow groundwater systems discharging to the flanks of Green Mountain, and there will be no impact to riparian habitat.

At a recharge rate of 1 inch/year, it would take 51 years to replenish this drawdown, and at 2 inches/year, 26 years.

These calculations show, for example, that it would take 63 to 126 years for total water table recovery, at a radial distance of 3,600 feet from the center of the mine. In real life, a significant portion of the mine inflow will come from inter-workings drainage, and not from the water table as assumed in these calculations. Hence, recovery will be quicker than estimated in these calculations.

The WDEQ "Agreed to Model" with GMMV worst case inflow estimates the cone of water table drawdown is entirely within Green Mountain and no shallow groundwater system will be discernably affected. Similarly, during the recovery process, there will be no discernable effect to the shallow groundwater systems.

If, effects were to be other than estimated, mitigation would be required; appropriate mechanisms for this process have been provided.

Figure HY 12.9 (GMMV 1994: Volume 1a, Section HY 12 and Figures) shows the recovery calculations made with the WDEQ "Worst Case Model". A standard superposition-in-time procedure was used. The calculations show that recovery is rapid immediately following cessation of mining, but then slows greatly as gradients are dissipated. For the WDEQ worst case, the residual drawdown is less than 5 feet everywhere after 50 years of recovery. The same model with the GMMV worst-case pump rate of 732 gpm as shown on Figure 12.8 (GMMV 1994: Volume 1a, Section HY 12 and Figures) gives a drawdown of less than 2 feet after 50 years recovery.

Implicit in the calculation is the assumption that recovery occurs by inflow derived from storage in an infinite aquifer. Thus, recharge is not considered in this calculation. Recharge will hasten the recovery, and actual recovery times are expected to be less than those estimated in these calculations.

Post Mining Potentiometric Surface maps for the GMMV worst case model and the WDEQ worst case model are located in GMMV 1994: Volume 1a, HY 12.6 and HY 12.7.
HY 19.7 RIPARIAN GROUNDWATER MONITORING

A series of twelve additional paired shallow monitoring wells (completed at 20-feet and 100-feet depths) is proposed specifically to verify the limits of effect that might be induced on the shallow groundwater systems as a consequence of mine pumping. The well pair locations are shown on GMMV 1994: Volume 1a, Figure HY 19.2, and the proposed monitoring frequency for the wells (designated as PZ-9 to PZ-22) is given in Table HY 15.1.

The procedures used to calculate drawdowns assume infinite systems, and as a consequence, a point of zero drawdown cannot be calculated. In all cases, it has been assumed that a calculated drawdown of 3 to 5 feet (after 25 years pumping) represents an effective radius of impact. The proposed additional wells have all been located within the WDEQ Model Worst Case estimated limit of impact. By locating the monitoring wells within the estimated zone of effect, responses will be detected earlier than if the wells were at the outermost limits. If monitoring indicates mining-induced charges are occurring, then the location will be reviewed and, if deemed necessary, additional monitoring locations will be proposed to the WDEQ and constructed when approved.

The monitoring wells will be completed prior to the continuation of decline construction. Water level charges that will trigger the onset of reporting to the WDEQ and investigation of cause will be as specified, or determined, for the other PZ series of wells, which because of their longer record, will provide a better baseline record of natural fluctuation prior to mining.

HY 20.0 RIPARIAN HABITAT ENHANCEMENT AND MONITORING PROGRAM FOR GMMV'S JACKPOT MINE

INTRODUCTION

GMMV's proposed underground uranium mine on Green Mountain has created speculation and differences in opinion as to the possibility that such operations would, over time, result in a drawdown or dewatering effect on the mountain and subsequent effects to the existing riparian habitat areas of the mountain. Based on existing records, hydrological data, and other data collected and analyzed to date, GMMV's hydrologists do not anticipate any impact to riparian habitat resources. Nevertheless, they
Type, Location, and Design of Wetlands

There are many alternatives and options in the selection of the type, location, and design of created and enhanced wetlands, and the following plan is offered as an example of what could be done. The ultimate plan would be tailored to best suit the resource needs and the management objectives of the WDEQ, WGFD, BLM, and GMMV. Types of actions that could be employed to produce or enhance wetlands are described below. Sites on Green Mountain where these actions could be performed are referenced, by number, in GMMV 1994:Volume 1a, Riparian Habitat Enhancement and Monitoring Program (RHEMP), Figure 2.

Types and Potential Locations

1. Construct small dams to replace currently dysfunctional old beaver dams. Several locations on the south and north slopes of the mountain have broken beaver dams that no longer impound water and could be enhanced (GMMV 1994:Volume 1a, RHEMP, Figure 2, #1). The general configuration of these small impoundments is illustrated in GMMV 1994:Volume 1a, RHEMP, Figure 4.
   - Good sites for small impoundments.
   - Will increase the size of the relatively small wetland habitats that remain behind these long-broken dams.
   - Flood control and water retention.
   - Increase in acreage of several wildlife wetland habitats including open water, wet meadow, montane wetland, and riparian/forest scrub.
   - Increase in wetland habitat acreage will increase the species diversity of plants and animals on the area.

2. In topographically suitable areas, increase the size of existing impoundments and/or new ones by the physical removal of a relatively small amount of earth adjacent to the catchment basins (GMMV 1994:Volume 1a, RHEMP, Figures 2, #2, and #3). The general configuration of these small impoundments is illustrated in GMMV 1994:Volume 1a, RHEMP, Figure 4.

3. Drill wells and use windmills to maintain small reservoir/wetlands in areas where surface runoff is not adequate to maintain an impoundment. Some minimal earth removal may be necessary in order to create a catchment basin. Areas on the southern, lower-elevation foothills of Green Mountain would lend themselves well to this type of development (GMMV 1994:Volume 1a, RHEMP, Figure 2, #3).

4. Divert stream flow into adjacent low-lying areas and create new wetland pockets adjacent to streams with perennial flow (GMMV 1994:Volume 1a, RHEMP, Figure 2, #4).

5. On the top of Green Mountain, excavate depressions deep enough to access the perched water table to create shallow open ponds with gradually tapered shorelines and saturated water zones that will support hydrophilic vegetation (GMMV 1994:Volume 1a, RHEMP, Figure 2, #5).

6. Use pumped water from the mining operation to assist in establishing wetlands. This could be achieved by treated water being pumped to the heads of several drainages within approximately one-half mile of the portal (GMMV 1994:Volume 1a, RHEMP, Figure 2, #6).

Wetland Habitats Created

Although the types of methods used and the actual configurations of the wetlands created or enhanced vary considerably, the end product will support a gradient of habitats that will be similar. In all cases, some form of depression will be used to collect and retain water. For the most part, only the method used to supply water to the basin varies. The pattern of wetland habitats created through the proposed enhancement program is illustrated in GMMV 1994:Volume 1a, RHEMP, Figure 5. In each case, an area of open water is surrounded by concentric rings of different habitat types that represent changes in vegetation in response to decreasing water depths and soil moisture levels.

Other Considerations

1. Although newly-created waterbodies are generally vegetated fairly rapidly by naturally-invading species of pioneering aquatic plants, it may be necessary to accelerate the process by transplanting desirable native species.
In order to control vegetation and facilitate repairs and maintenance, it is desirable to have some means for draining impoundments.

Size of impoundments which rely on natural runoff for water must be determined by the amount of catchment watershed available. A ratio of 20 hectares of watershed per one hectare of impoundment is recommended, and an even greater ratio may be required on Green Mountain.

The relative amount of open water, wet meadow, shallow marsh, and deep marsh in smaller impoundments can be maintained as desired through the regulation of water levels.

Planning and Coordination Measures

Prior to the commencement of wetland enhancement and construction measures, a series of steps would be taken to insure that all agency managers and specialists were in agreement with GMMV as to the objectives and procedures used. These steps are as follows:

Step 1 - Plan Examination

The first step would involve the distribution of the written plan to agency representatives of the WDEQ, WGFD, BLM, and COE for their comments and suggestions. It is anticipated that wildlife biologists, hydrologists, and managers would be involved.

Step 2 - Field Reconnaissance

All of the agency representatives described in Step 1 would be invited to examine potential sites for wetland construction and enhancement, the nature of existing wetlands, and the overall environment and setting of the project.

Step 3 - Planning and Coordination Sessions

Following the field reconnaissance, GMMV and agency representatives would be asked to reconsider the GMMV proposal, modify as required and desirable, and agree on an overall plan for enhancement and creation of wetlands.

Step 4 - Develop Preliminary Design Plans

The input from agency representatives would be incorporated into a set of preliminary design plans that would result in the creation and/or enhancement of approximately 20 acres of wetland habitats. These plans would be reviewed and approved or modified by the entire group and a set of final design plans developed.

Step 5 - Construction and Implementation

Following approval of the final design plans, construction and implementation would commence. Regular reports on the progress of the program would be submitted to GMMV and the agency representatives, and periodic inspections of progress in the field would be scheduled.

Step 6 - Final Inspection

Once the construction phase is completed and the operational phase begins, a final report would be submitted to all agency representatives, who would be invited to make a final inspection of results.

Step 7 - Operation and Monitoring

Once the new wetlands become operational, the monitoring phase of the project will commence and will be carried out according to the procedures described below in the Monitoring Plan.
MONITORING PLAN

The following wetland monitoring plan has been designed for the purpose of: 1) determining whether or not mining activities result in long-term changes in wetland characteristics within the Green Mountain Study Area, and 2) evaluating the effectiveness of wetlands created or enhanced according to the plan set forth in this report. The main purpose of this conceptual plan is to present an approach and some suggested methodologies that can be examined by WDEQ and other involved agencies, for adequacy, completeness of coverage, and appropriateness of evaluation criteria. This plan will be further developed and modified to reflect the constructive criticisms and comments received by agency representatives.

The establishment and execution of the monitoring plan for existing wetlands consists of the following five basic processes:

- the selection of key environmental parameters whose periodic measurement will adequately detect and document significant changes in wetland characteristics over the life of the mine;
- the selection of sampling methodologies that will accurately and meaningfully measure changes in key environmental parameters;
- the establishment of baseline conditions on the study area wetlands prior to commencement of mining activities (This will involve an initial detailed measurement of all key parameters.);
- development of a sampling program in which key parameters are measured at meaningful intervals in time that will detect and document deviations from baseline conditions; and
- selection of a control area and wetland measurement sites that closely approximate baseline conditions on Green Mountain (GMMV 1994:Volume 1a, RHEMP, Figure 6).

A program, parallel to that used on Green Mountain, will be developed in which baseline conditions on the control area are established. The same key parameters will be used to determine baseline and will be remeasured at the same points in time as on Green Mountain. The main purpose for measurements on the control area is to determine whether observed changes in wetland characteristics over time are due to mining activities or regional changes in climate.

The establishment and execution of the monitoring plan for the enhanced or constructed wetlands is the same as that described above except that changes in wetland characteristics over time will not be compared to a control area. Preconstruction conditions at each of the wetland sites will be the only basis used for measurements of change.

Measurement Parameters

The following environmental descriptors are considered key parameters and will be measured over time to detect meaningful changes in wetland characteristics.

Vegetation

Ground Coverage by Vegetation Type and Open Water

Aerial photography - Total ground coverage of each of the wetlands within the Green Mountain Study Area will be digitized and entered into a computer program that measures area. The same procedure will be applied to a representative number of comparable wetlands on the control area. The total area of each of the wetland types and the amount of open water present will be measured. Aerial overflights will be scheduled and new aerial photos taken at 5-year intervals and the above-described measurement repeated. Overflights will be scheduled for the same time each year to represent comparable hydrologic time periods.

Fixed photo points - Permanent or fixed photo points and range pole locations will be established on the ground at each wetland site on both the Green Mountain Study Area and the control area. Photographs from all photo points will be taken at intervals of 5 years throughout the monitoring program to document physical changes in wetland characteristics. Both panoramic and detailed photographs of the vegetative characteristics will be taken.

Line Transects - Permanent line transects radiating outward from the center of each wetland will be established and marked with steel fence posts driven into the ground. Four transects per wetland will be established, with one transect being systematically located within each of the four compass quarters of
each wetland. Measurements of the widths and outward extent of each of the wetland habitats will be measured at 5-year intervals to document changes.

Vegetation Map - Based on the data obtained from the measurement of ground coverage described above and the measurement of species composition described below, a digitized map of the vegetation types of each wetland will be entered into the computer and printed. These data will be integrated and new maps printed every 5 years.

Species Composition

Line transects and plots - Every 5 years, plant species composition will be measured along the same permanent line transects described above under the Ground Coverage section. Measurements will be made on 1 square foot rectangular plots measuring 8 by 18 inches. These plots will be spaced at 10-foot intervals along the transects. On each plot, the percentage of ground covered by each plant species, as well as bare ground, will be estimated using a series of six cover classes.

Biomass Production - Vegetation production and utilization will be measured at 5-year intervals by determining air-dried weights of clipped vegetation on paired 4-foot-square plots located within each major cover type on each wetland. One plot in each pair will be unprotected and one will be covered with a wire cage to prevent grazing by livestock and big game.

Phytoplankton and Vascular Aquatic Plants - Species of phytoplankton, as well as emergent, submersed, and floating vascular plants will be determined for each wetland at 5-year intervals. Each area of open water will be waded or floated along line transects and specimens of plants collected by means of dip netting, by hand, or with vegetation rakes.

Wildlife

Big game - Evidence of big game use of wetland habitats will be measured at 3-year intervals along 6-foot belt transects radiating outward from the center of each wetland. Four transects per wetland will be established with one transect being systematically located within each of the four compass quarters of each wetland. Compass bearings for each of the transects will be recorded with the same bearing being walked during successive sample periods. In addition, sightings of big game animals made during the performance of other surveys will be documented.

Birds - Breeding bird surveys will be conducted prior to the commencement of mining operations and every year following for the first 5 years of operation. If no significant changes are noted during the first 5 years of monitoring, subsequent surveys would be performed at 3-year intervals. If changes are found during the first 5 years these surveys would be continued on an annual basis.

Bird surveys will be conducted during late May through June by walking the concentric habitat types within each of the wetlands, as well as the ecotone between the outermost wetland type and the adjacent upland. During the surveys, all bird species observed or heard will be identified and the habitat noted. Locations of all nests found will be plotted on the vegetation map.

The occurrence and numbers of migrating waterfowl and other water-associated birds will be documented during the spring and fall migration periods (April - May and September - November). Survey periodicity will be the same as described above for breeding bird surveys.

Aquatic mammals - The occurrence of aquatic mammals will be documented during other surveys previously described; no special surveys are required. Observations of live animals and/or their sign will be documented.

Small mammals - The occurrence of small mammals at representative sites for each of the wetland types will be documented through the implementation of a trapping program. As with the breeding bird surveys, small mammal trapping will be conducted prior to the commencement of mining operations and every year following for the first 5 years of operation. If no significant changes are noted during the first 5 years of monitoring, subsequent surveys would be performed at 3-year intervals. If changes are found during the first 5 years these surveys would be continued on an annual basis.

Small mammal trapping will be conducted during June by placing Sherman live traps, snap traps, and pit fall traps within the concentric habitat types within each of the wetlands, as well as the ecotone between the outermost wetland type and the adjacent upland. Survey configurations will be modified to fit the size and shape of the habitat types, with traps being spaced at 50-foot intervals. Trapping on a given wetland
would continue for 4 consecutive nights. The number of trap nights per wetland would depend on the total number of traps, determined by the standard 50-foot spacing interval and the size of the wetland.

Other species - The occurrence of lagomorphs and mammalian predators will be documented during other surveys previously described; no special surveys are required. Observations of live animals and/or their sign will be documented.

Aquatic Macroinvertebrates

Aquatic macroinvertebrates will be sampled within each wetland prior to commencement of mining activities and at 1-year intervals thereafter within representative sites for each of the wetland types. Each of the niches within each macrophyte habitat should be sampled over the course of at least one annual cycle. Samples should be obtained with a D-frame dip net, with unknown species collected for subsequent identification in the laboratory.

Climatological

Basic climatological data representative of the Green Mountain and control area environments would be collected on a continuous basis. Such data would include measurements of precipitation, temperature, humidity, and wind speed. A weather station has been installed at the Big Eagle Mine Site to accumulate the necessary data.

Water Quality

In open water habitats, standard water quality measurements and analyses would be conducted annually on representative sites for both the Green Mountain Study Area and the control area. These measurements would be taken not only within the actual wetland habitat, but also from locations both upstream and downstream from the wetland.
Five sites and conceptual plans are presented for consideration for the initial wetland enhancement effort of 20 acres. A combination of these sites could be used, with varying acreages at each site to achieve the desired mix and distribution of enhanced areas. An overview location of each of these sites is presented in GMMV 1994: Volume 1a, Potential Riparian Habitat (Wetland) Enhancement Sites and Possibilities (PRHESP), Figure 1. More detailed map views are presented in the five figures for the individual sites. The site plans represent preliminary efforts to apply wetland enhancement principles and methods to specific sites. It is anticipated that much more detailed planning, modification, and input from agency and landowner representatives will be required before implementation. In some cases, it may be necessary to select alternative sites.

**SITE PLANS**

**Site 1 - Crook's Creek Impoundment**

An impoundment of up to 100 acres could be created by constructing an earthen dam across Crook's Creek in Section 17, T27N, R92W. As shown in GMMV 1994: Volume 1a, PRHESP, Figure 2, this dam could also serve as the surface for the haul road currently under consideration as a BLM alternative in the NEPA analysis for the proposed Jackpot Mine. The area on the upstream side of the dam would be excavated to provide the borrow necessary for construction of the dam and the elevated roadway and to create a conservation pool for low water periods.

Water control devices, such as the drop inlet control structure, would be installed to allow control of water level, downstream flows, aquatic vegetation manipulation and control, and the option to drain the reservoir when required for maintenance purposes.

The outside perimeter of the impoundment would be fenced to prevent livestock from concentrating and damaging aquatic and mesic vegetation. Fenced corridors leading to the water would be provided in several places to allow livestock controlled access for drinking. A four-strand barbed wire Type III fence, as defined by the WDEQ, should be used. The bottom strand of this fence should be of smooth wire 15 inches above the ground surface. The height of the top strand should be 42 inches above the ground.

Side slopes of the impoundment area should be graded to a 4:1 or 5:1 ratio, resulting in a water depth of 3 feet or less over approximately 40% of the reservoir. Such a configuration will allow colonization of aquatic emergent and submergent vegetation in these shallow water zones and provide feeding, escape, and nesting cover for waterfowl species (GMMV 1994: Volume 1a, PRHESP, Figure 3). Some revegetation and basic reclamation procedures should be undertaken to accelerate the establishment of vegetative cover and to minimize surface erosion and sedimentation.

**Site 2 - Fourth Creek Impoundment**

An impoundment of up to approximately 10 acres could be created by constructing an earthen dam across Crook's Creek in Section 17, T27N, R92W (GMMV 1994: Volume 1a, PRHESP, Figure 4). This dam would be placed in the approximate location of an old beaver dam that is now nearly washed away. By excavating several acres of adjacent sagebrush slopes, the capacity of the impoundment could be enlarged proportionately.

This impoundment would be maintained by surface runoff, but could initially be supplemented with pumped, treated mine water if desired. No engineered water control devices would be required, but a vegetated overflow spillway should be installed to allow normal runoff to be discharged.

The outside perimeter of the impoundment would be fenced to prevent livestock from concentrating and damaging aquatic and mesic vegetation. Fenced corridors leading to the water would be provided in several places to allow livestock controlled access for drinking. A four-strand barbed wire Type III fence, as defined by the WDEQ, should be used. The bottom strand of this fence should be of smooth wire 15 inches above the ground surface. The height of the top strand should be 42 inches above the ground.

Side slopes of the impoundment area should be graded to a 4:1 or 5:1 ratio, resulting in a water depth of 3 feet or less over approximately 40% of the reservoir. Such a configuration will allow colonization of aquatic emergent and submergent vegetation in these shallow water zones and provide feeding, escape, and nesting cover for waterfowl species. Some revegetation and basic reclamation procedures should be undertaken to accelerate the establishment of vegetative cover and to minimize surface erosion and sedimentation.
Site 3 - Lost Creek Impoundment

An impoundment of up to approximately 5 acres could be created by constructing an earthen dam across a pair of tributaries to Lost Creek in SE 1/4 Section 17, T27N, R91W (GMMV 1994:Volume 1a, PRHESP, Figure 4). This dam would be constructed in the approximate location of an old beaver dam that is currently breached and dysfunctional. By excavating several acres of adjacent sagebrush slopes, the capacity of the impoundment could be enlarged proportionately.

This impoundment would be maintained by surface runoff, but could be initially supplemented with pumped well water, if necessary. No engineered water control devices would be required, but a vegetated overflow spillway should be installed to allow normal runoff to be discharged.

The outside perimeter of the impoundment would be fenced to prevent livestock from concentrating and damaging aquatic and mesic vegetation. Fenced corridors leading to the water would be provided in several places to allow livestock controlled access for drinking. A four-strand barbed wire Type III fence, as defined by the WDEQ, should be used. The bottom strand of this fence should be of smooth wire 15 inches above the ground surface. The height of the top strand should be 42 inches above the ground.

Side slopes of the impoundment area should be graded to a 4:1 or 5:1 ratio, resulting in a water depth of 3 feet or less over approximately 40% of the reservoir. Such a configuration will allow colonization of aquatic emergent and submersed vegetation in these shallow water zones and provide feeding, escape, and nesting cover for waterfowl species (GMMV 1994:Volume 1a, PRHESP, Figure 3). Some vegetation and basic reclamation procedures should be undertaken to accelerate the establishment of vegetative cover and to minimize surface erosion and sedimentation.

Site 4 - Crooks Creek Stream Flow Diversion

Up to approximately 9 acres of wetland wildlife habitat could be created by stream-side grading and shaping, and diverting Crooks Creek at the intersection of the section lines of Sections 13, 14, 23, and 24 in T27N, R92W (GMMV 1994:Volume 1a, PRHESP, Figure 5). The stream-side topography in this area of gentle gradient could be reshaped to create a shallow water impoundment adjacent to the creek that would support a variety of wildlife species (GMMV 1994:Volume 1a, PRHESP, Figure 6). A small earthen berm would be constructed at the outflow or downstream end of this habitat unit and would include a vegetated overflow or spillway to return runoff water to the Crooks Creek channel.

The outside perimeter of the habitat unit would be fenced to prevent livestock from concentrating and damaging aquatic and mesic vegetation. A four-strand barbed wire Type III fence, as defined by the WDEQ, should be used. The bottom strand of this fence should be of smooth wire 15 inches above the ground surface. The height of the top strand should be 42 inches above the ground.

Some revegetation and basic reclamation procedures should be undertaken to accelerate the establishment of vegetative cover and to minimize surface erosion and sedimentation.

Site 5 - Taggart Meadows Enhancement Area

A previously created impoundment of approximately 2 acres was recently fenced by GMMV to prevent livestock from overgrazing and deteriorating the banks and slopes leading into the reservoir. Enhancement of this area in west-central Section II, T27N, R92W will continue, and includes a reclamation plan in the GMMV Big Eagle Mine Permit to revegetate areas previously overgrazed (GMMV 1994:Volume 1a, PRHESP, Figure 7). This plan will result in the production of improved wildlife habitats both adjacent to and within the impoundment and will increase the life of the reservoir by arresting erosion and reducing the sedimentation rate.

HY 22.0 HABITAT ENHANCEMENT COMMITTEE (HEC)

A Habitat Enhancement Committee (HEC) has been formed to advise, consult and make determinations on a continuing basis regarding the Riparian/Aquatic Enhancement and Monitoring Program. The HEC consists of technical personnel from the BLM, WGFD, WDEQ and the Permittee.

The GMMV will implement the enhancement program which, after consultation with the HEC, may include:

- development of riparian habitat enhancement per plan contained herein;
- fencing off some of the riparian habitat areas that are degraded by livestock and horses;
• evaluations for constructing riparian/aquatic areas on top of the mountain;
• the construction of fencing of heavy buck-and-rail type;
• the study of select representative riparian/aquatic habitat areas on an annual basis and a comprehensive assessment of all riparian aquatic habitat areas;
• the determination of water balance analyses for riparian/aquatic habitat areas within the area which may be subject to mine-induced drawdowns to determine whether the riparian aquatic habitat areas could function without groundwater contribution; and
• the institution of studies to develop general criteria for sizing riparian/aquatic habitat areas to match the available watersheds.

HY 22.1 ENHANCEMENT WATER RIGHTS

All water rights are shown and listed on GMMV 1994:Volume 2, Appendix E, Map E-1 and described in GMMV 1994:Volume 4, D.6 Hydrology, Section 4.0. The HEC will determine the location and type of enhancement that the permittee will be authorized to complete. Applications will be filed and Appropriation for Groundwater and/or Surface Water will be obtained from the State Engineer’s Office, subject to the location and type of enhancement and status of existing rights thereon.

MITIGATION

1.0 INTRODUCTION

The proposed Jackpot Mine and its operations have been designed to minimize the potential for deleterious effects on the environment, and monitoring programs have been incorporated into the Mine Plan to measure achievement of this goal. Only those items addressed in this section will be considered as mitigation.

Mining is anticipated to be by room and pillar methods, although other methods may be considered, according to a plan which will limit caving to a very limited zone above the underground excavations. Accordingly, there will be no surface disturbance (subsidence) as a consequence of the proposed underground excavations.

Green Mountain is characterized by the presence of intermittent and ephemeral drainages which contain springs and seeps, and by the presence of hydraulically discontinuous perched aquifer systems. The natural variability in surface water flow rates and groundwater levels is high. As a consequence, it can also be anticipated that riparian areas may vary considerably in character and area from season to season and year to year. The definition of quantitative monitored threshold parameters as triggers for the commencement of mitigation within such an environment, are not considered realistic. Consequently, studies will be undertaken that will consider the inherent natural variability of the hydrological regimes, to determine the necessity for mitigation.

It is a regulatory requirement that consideration be given to the possibility that mining-induced environmental effects might be other than anticipated and that mitigation measures be considered for such unlikely events. Accordingly, the following sections detail monitoring programs and possible mitigation measures.

2.0 SUMMARY OF MITIGATION STRATEGIES

Mitigation can be seen as a procedure to repair, replace, or compensate for a deleterious impact. The mitigation strategies present in this section will accomplish these goals. However, it is believed that these strategies can be improved upon by embarking on a program of riparian habitat enhancement prior to the start of mining.

2.1 RIPARIAN AREA ENHANCEMENT

Prior to mining activities at the Jackpot Mine, GMMV proposes to enhance existing or established riparian habitat areas as outlined and detailed in the "Riparian Habitat Enhancement Program." See GMMV 1994:Volume 1a, Sections HY 20.0 and HY 21.0 in the Hydrological Effects of Mining.

2.2 RIPARIAN MONITORING PRIOR TO MINING

The proof of need to provide mitigation is dependent on monitoring. Accordingly, prior to mining activities at the Jackpot Mine, or concurrent with the commencement of such activities, a detailed riparian habitat monitoring program will be established that includes:
reference riparian habitat areas, similar in character and elevation, that are remote from Green Mountain, the proposed mining activities, and specific areas on Green Mountain; and detailed monitoring of both the reference areas and the areas on Green Mountain that fall within the area of potential influence. (This will include the most applicable methods, including aerial photographs, on-site measurement, necessary flora inventories, etc.)

A generalized riparian habitat monitoring plan is included in GMMV 1994:Volume 1a, Section HY 20.0, Hydrological Effects to Mining.

2.3 SUMMARY OF MITIGATION STRATEGIES

If existing riparian habitat areas are seen to change over time, then studies will be initiated to determine if such changes are a result of the mining activities. If the deleterious changes are determined to be a result of such mining activities, mitigation and/or replacement will be initiated by GMMV.

If mine dewatering rates exceed GMMV’s maximum estimate of 7.2 gpm, then studies will be initiated to determine the potential effects of such higher rates on riparian habitat areas, the hydrological model, and its parameters.

Proposed mitigation strategies are summarized in Table 2.1.

3.0 WILDLIFE AND FISH

It is the intent of GMMV that the proposed Jackpot Mine will have minimal impact on the wildlife of the area. This will be accomplished by implementing the following measures.

3.1 EMPLOYEE EDUCATION

Employees will be made aware of the State of Wyoming game laws, the consequence of game law violations, and applicable Federal Regulations pertaining to wildlife and federally listed threatened and endangered species. Employees will also be instructed on their actions upon encountering wildlife,
including the requirement not to harass or purposely disturb wildlife, particularly those species which are sensitive during all or part of the year.

3.2 FENCING

Perimeter fencing is planned for security around the mine site and adjacent area (see GMMV 1994:Volume 1, Mine Plan Map M-1). Security fence will be chain link fence with appropriate locked access. Temporary protective fencing, when required for revegetation, is proposed to be two wire electric fence. Wire will be spaced from the ground so as not to restrict movement by wildlife. This type of fence will be used if it is necessary to protect establishing vegetation from area livestock.

3.3 RAPTOR NESTS

There are no known raptor nests within one mile of the existing and planned disturbed areas. Annual surveys will be undertaken (spring/summer) in mid-May through mid-June to locate new or previously unrecorded raptor nests for the area of disturbance plus one (1) mile radius, and the access road and one-half (1/2) mile margin on either side, within the Permit Area. The survey will include an area one mile radius from the Jackpot Mine portals, and one-half mile on either side of the access road within the Mine Permit boundary. The survey will report the condition, status, and production for all known nests. Results will be summarized in the Annual Report to the WDEQ (see GMMV 1994:Volume 2, Supplement to Appendix D.9, Wildlife).

Prior to disturbance of any new or existing raptor nests, a special purpose permit will be obtained from the WGFD and USFWS.

3.4 SAGE GROUSE MONITORING

Baseline surveys were undertaken to locate new or previously unrecorded sage grouse leks. The surveys were completed in late March and early April 1994. The surveys included an area, at least one (1) mile radius from the Jackpot Mine portals, and one-half (1/2) mile on either side of the access road within the Mine Permit boundary. The survey report is included in GMMV 1994:Volume 2, Appendix D.9, Wildlife.

3.5 THREATENED AND ENDANGERED SPECIES

A baseline survey for vegetation and wildlife was completed by D.K. Resources, Inc. and is included in GMMV 1994:Volume 2, Appendix D.8 and Appendix D.9, respectively. An additional survey was completed by Hayden-Wing and Associates and Ecotone Environmental Consulting, Inc. (see GMMV 1994:Volume 6, Appendix D-11, Wetlands, Part III). The USFWS Endangered Species Office, Helena, Montana, will be notified in the event a federally listed threatened or endangered species is observed. All such observations will be summarized in the annual report submitted to the WDEQ-LQD.

3.6 BLACK-FOOTED FERRETS

Newly formed or existing prairie dog towns will be searched for black-footed ferrets within one year prior to the planned disturbance of that town. Results will be submitted to the USFWS, office of Endangered Species, Billings, Montana, for clearance by that agency.

3.7 BIG GAME

A ground survey was conducted for observations of big game in February 1994. The survey area included the Mine Permit area plus a one (1) mile perimeter and one-half (1/2) mile on each side of the access road within the Permit boundary. The survey is included in GMMV 1994:Volume 2, Appendix D.9, Wildlife. Annual monitoring of big game will be conducted for the same area, and results will be reported in the annual report to the WDEQ.

3.8 FISH

An "Occurrence of Fish Survey" was undertaken in the fall of 1993. The survey was conducted in Fourth Creek at various locations down drainage from the mine water discharge point and down-stream on Crooks Creek from the Fourth Creek confluence. These survey data are included in GMMV 1994:Volume 2, Appendix D.9, Wildlife.
4.0 HABITAT AND RIPARIAN AREAS

Should wetlands mitigation become a requirement of project implementation, mitigation should be considered in the following priority, from highest to lowest: 1) avoidance of wetlands; 2) impact minimization; 3) mitigation in-kind, on-site; 4) mitigation in-kind, off-site; 5) mitigation out-of-kind, on-site; and 6) mitigation out-of-kind, off-site. In addition, the following modes of mitigation, listed in order of preference, may be implemented for wetlands if avoidance and impact minimization are not practicable: 1) wetlands restoration, 2) wetlands creation, and 3) wetlands enhancement. Only after it is demonstrated that total avoidance and impact minimization are not feasible should other mitigation strategies be considered. The general objective and goal of mitigation should include replacement of functional values and cumulative area lost due to project implementation.

All trees removed by mining-related activities will be replaced during the mining or reclamation periods. Tree containerized seedlings and/or bare-rooted stock will be planted for replacement, with the goal of maintaining the overall habitat areas of Green Mountain.

Prior to the surface disturbance of additional areas within the Mine Permit boundary, wetlands will be reviewed in order to minimize any adverse effects to riparian and associated areas (GMMV 1994: Volume 6, Appendix D.11).

It is estimated that approximately 0.24 acre of wetland type lands will be removed during the widening of the existing road. Approximately 0.2 acre of riparian scrub will be removed as a result of a portion of No Name Drainage being covered by the waste pile and the sediment basin and dam. Any habitat removed because of these disturbances will be replaced in kind. All timber pine, willows and aspen removed as a result of construction will be replaced using containerized seedlings and/or rooted stock.

If changes occur to specific habitats and riparian areas, and should subsequent investigations reveal a mining-induced deleterious effect, then the WDEQ will be notified and mitigation measures will be determined. Measures that could be considered include, but are not limited to:

5.0 MINE SITE AND ASSOCIATED AREAS

The Reclamation Plan details the measures proposed for ultimate reclamation of disturbed land affected by mine-related activities. These measures, of themselves, comprise the necessary mitigation of land disturbance resulting from the mine construction, mine facilities, and operation.

5.1 SOILS

In the event topsoil is required to be stripped, the stripping depth will be monitored and adjusted in the field by a certified professional soil scientist or other approved individual. Topsoil stockpiles will be clearly identified with signs labeled "Topsoil".

The topsoil and subsoil stockpiles will have 3:1 (horizontal/vertical) side slopes and typically will be approximately 20 feet high.

As the project area is exposed to southwesterly winds which may cause some soil erosion, the stockpiles will be oriented with the prevailing wind direction as much as possible. In addition, slatted snow fence or other methods may be used, on or near the stockpiles to reduce wind erosion. The stockpiles will also be blended into adjacent terrain and will be seeded with a mixture of annual and perennial species to promote rapid stabilization.

6.0 GROUNDWATER

No deleterious groundwater effects are forecast as a consequence of mining, and an extensive monitoring system has been proposed which is, in the main, already in place.
Drainage into the mine is anticipated to occur at a rate of approximately 470 gpm, and the drainage water will be derived from the strata immediately adjacent to the declines, from the strata between the various levels of mining, and by drainage and seepage from the strata above. It is not anticipated that there will be any discernible effects to groundwater systems feeding springs, seeps, or groundwater systems which are, or may be, used as water supply sources (see GMMV 1994:Volume 1a, Mine Plan, Hydrological Effects of Mining, and Volume 8, Hydrology Response).

Surface exploration holes encountered by the underground mine workings that are producing substantial quantities of water will be sealed through the use of packers or grout. This action will minimize mine water inflows and the mixing of water from different water-producing zones.

Groundwater monitoring results will be reported as outlined in GMMV 1994:Volumes 1 and 1a, Mine Plan, Hydrological Effects of Mining, and Section HY 15. It is proposed as an interim measure that if 3 successive water levels show a deviation of 5 feet or more from the mean water level recorded in the base line monitoring, then specific investigative activities will be initiated to identify the cause, and the WDEQ-LQD will be notified. Should the investigations reveal a mining-induced deleterious effect, appropriate remedial measures will be proposed. In the case of unacceptable aquifer drawdown, mitigation measures might include local infiltration, and hence recharge, augmentation (e.g., recharge ponds), or injection of appropriate quality water (e.g., treated mine discharge water). It is also proposed that all of the data from the baseline period, together with the data that will be collected in the premining period, be collated and analyzed so the naturally occurring trends and variances can be better defined. Based on these data, a report will be prepared for the WDEQ to define more meaningful measures of change which would lead to the triggering of the reporting and mitigation process.

7.0 SPRINGS AND SEEPS

Springs and seeps at Green Mountain are, in some cases, ephemeral and can be expected under natural conditions to vary widely in flow rates from year to year. Definition of variance and specification of threshold values to provide a trigger for instigation of mitigation measures cannot under such circumstances be realistically provided. A baseline survey of the mountain has been made (see GMMV 1994:Volume 6, Appendix D.11, Wetlands). As a result of this survey, jurisdictional wetlands and habitat have been identified, as have zones of springs and seeps, together with estimates of aggregate flows in the zones.

Mining-induced effects to springs and seeps, should they occur, will be localized to the drainage lines immediately adjacent to the declines, and it is proposed that the quantitative monitoring be based on observations in the proposed drainage line alluvium wells (see GMMV 1994:Volume 1a, Mine Plan, Hydrologic Effects of Mining, Section HY 15.0). If 3 successive water levels show a deviation of 5 feet or more from the mean water levels recorded in the baseline monitoring, then specific investigative activities will be initiated to identify the cause, and the WDEQ-LQD will be notified. Should the investigations reveal a mining-induced deleterious effect, then appropriate remedial measures similar to those specified under 4.0 above will be proposed.

It is also proposed that the above criteria be treated as an interim trigger indicator, and that all of the data from the baseline period, together with the data that will be collected in the premining period, be collated and analyzed so the naturally occurring trends and variances can be better defined. Based on these data, a report will be prepared for the WDEQ to define more meaningful measures of change which would lead to the triggering of the reporting and mitigation process.

Mitigation, in the event that deleterious mining-induced effects are noted, might include release of treated water down the affected drainage to enhance recharge, the emplacement of horizontal drains to restore seepage flows, or the installation of windmill-operated wells to restore the affected shallow systems; or could include the provision of equivalent areas of wetland elsewhere, as has already been successfully done by USE on Green Mountain.

8.0 STREAMFLOW EFFECTS

Streamflow will be monitored as described in GMMV 1994:Volume 1a, Mine Plan, Hydrologic Effect of Mining, Section HY 15.0. Flow duration curves will be prepared for each year of operation of each flow recording station. Should any flow duration curve show that the flow rate which is exceeded 75% of the time, show a decrease of 25% or more from any previous year, then the WDEQ-LQD will be notified and appropriate investigations into the cause will be made. Should the investigations reveal
a mining-induced deleterious flow decrease, consideration will be given to the compensatory release of mine discharge water treated to NPDES standards, or to the release or pumping of groundwater.

9.0 WATER QUALITY

Any effects on water quality will most likely relate to the planned release of approximately 470 gpm mine drainage water to Fourth Creek. As a mitigation measure, all such releases will be treated to meet the requirement of NPDES Permit # WY-0033952. Though the anticipated release rate is approximately 470 gpm, provision has been made to progressively construct detention ponds for a prior estimated mine discharge rate of 3,900 gpm. As explained in GMMV 1994:Volume 8, Hydrological Responses, the calculation procedures which lead to the derivation of the higher mine inflow rate are not valid. However, this calculated result has been retained for ultimate retention pond design. The initial detention ponds are to be sized to handle a mine flow rate of 1,300 gpm. These provisions will provide excess capacity in the event mine drainage rates, for short- or long-term periods, exceed the anticipated mine discharge rates.

10.0 CHANNEL EROSION

Erosion transects and baseline values have been established (see GMMV 1994:Volume 1a, Mine Plan, Hydrologic Effects of Mining, Section HY 17.0). If subsequent monitoring shows an average difference between baseline and the proposed quarterly monitoring of more than 1.0 foot, then the WDEQ-LQD will be notified and investigations made to identify the cause. If the erosion is shown to be mining activity-induced, appropriate mitigation will be proposed. Measures might include such forms of channel protection as protective vegetation, gabions, rock armoring, riprap, or channel lining by half culvert emplacement. In addition, provision has been made to allow a portion of the mine water discharge to Fourth Creek to be diverted to No Name Creek.

11.0 ACID ROCK AND SOIL DISPOSAL

Mine waste rock will be hauled to the Big Eagle Mine and placed in the Big Eagle pits. Experience from prior mining in the Green Mountain area and the assessment of acid generation potential by mine rock by KEA Pacific indicate that there is little potential for acid generation from the material to be excavated from the mine and later placed in the designated mine rock disposal areas. Should material testing indicate an acid generation potential for any rock or soil, any such material will be worked into the mine rock and dispersed in such a way that there is sufficient buffering capacity to prevent acid generation. If testing indicates insufficient buffering capacity, lime will be added.

The sediment basin associated with the mine site will be constructed to capture all meteoric waters from the disturbed areas of the mine site. The sediment basin will be constructed to isolate this meteoric runoff from the disturbed areas of the mine site from any natural subsurface water zones (see GMMV 1994:Volume 1a, Mine Plan, Section 2.e., Sedimentation Dam and Basin).

The sediment dam will be designed for zero discharge under normal operating conditions and will have the provision for discharging stormwater events. Any discharge from the sediment basin resulting from a storm event will meet the requirements of NPDES Permit # WY-0033952.

12.0 DRILLHOLES INTERCEPTED BY UNDERGROUND WORKINGS

Drillholes which do not penetrate the Upper Battle Spring/lower Battle Spring unconformity will not impact or modify mine drainage. Only those wells which penetrate into the zone of partial desaturation, that will be induced above the proposed excavations, will have the capacity to induce mining-related impacts to the hydrological regime.

Data have been reviewed and compiled regarding the plugging of surface drillholes on Green Mountain (see GMMV 1994:Volume 5, Description of Drillhole Reclamation and Plugging Procedures for Anaconda Drilling Program, Attachment D.6-26). These data indicate that, in the main, exploratory surface drillholes were, in fact, plugged. This, coupled with the natural tendency of the clay strata to squeeze in, indicates that previously drilled holes are unlikely to lead to significant impacts to underground mine workings.

If, during mining, any open holes generating excessive water are encountered, it is proposed that they be plugged from below. Procedurally, this would be done by entering the hole from below to at least 200 feet above the workings, where a cement plug would be placed above a packer. The same strata would eventually be resaturated after mining.
Drillholes developed from underground locations during the exploration and/or mining phases resulting in excessive water being generated will be plugged by entering the hole and cement plugging above a placed packer or by similar techniques. The proposed exploratory drillholes are addressed in GMMV 1994: Volume I, Section 1.g, Underground Mine Plan.

13.0 CULTURAL SURVEY (ARCHAEOLOGY)

The entire Mine Permit Area and some segments of the Jackpot Mine access road have been subjected to the appropriate cultural (archaeological) surveys. The need for additional cultural clearance will be determined by the BLM.

In the event future surface activities do indicate cultural sites, the work will be suspended pending further detailed examination and possible mitigation for the cultural resource findings.

RECLAMATION PLAN

1.0 POSTMINING LAND USES

Land uses after mining will be identical to the premining land uses (see GMMV 1994: Volume 2, Appendix D.1, Land Use). All disturbed lands will be reclaimed to a condition equal to or greater than the highest previous use.

1.1 GENERAL RECLAMATION MEASURES

Approximately half of the total disturbance will be windswept slopes and ridges and half will be lee slopes; a very small area of disturbance will be riparian. The riparian area is more particularly described in GMMV 1994: Volume 6, Appendix D.11, Wetlands, Part II, Drainage Descriptions and Corresponding Figures, Drainages #9, No Name Drainage. No important sources of water, topographic features, or plant communities will be disturbed. Crooks Creek, which is classified as a Class II water, lies south of the permit boundary. Restoration of the access road and sediment basin will restore the premining balance of revegetated windswept slopes and ridges, lee slopes and all of the riparian vegetation.

Only a portion of the premine windswept slopes and lee slopes will be restored.

2.0 CONTOURING PLAN FOR AFFECTED LANDS

Surface configuration will be consistent with postmining land use. Affected lands will be contoured to blend with adjacent topography and associated land uses. On a location basis, applicable surface preparation will include necessary water bars, basins and other features to control erosion and sedimentation (GMMV 1994: Volume 2, Appendix D.7, Soils). Re-established drainages and slope conditions are depicted on the GMMV 1994: Volume 1a, Postmining Contour Map, Map No. R-1.

If additional land is affected (e.g., ventilation system openings to the surface), the affected areas will be reclaimed in accordance with the Reclamation Plan.

3.0 SURFACE PREPARATION: TOPSOIL AND SUBSOIL REPLACEMENT


3.1 TOPSOIL AND SUBSOIL PLACEMENT

Method of replacement, schedule of replacement, soil reconstruction procedure, depth of topsoil, erosion control, water conservation practices, and soil amendments are addressed in GMMV 1994: Volume 2, Appendix D.7, Soils, per WDEQ-LQD Guideline No. 1.

3.2 REVEGETATION PRACTICES

All revegetation practices are outlined in detail in GMMV 1994: Volume 2, Appendix D.8, Vegetation, and per WDEQ-LQD Guideline No. 2, dated March 1986, except for woody species transplants. Woody
species transplants may be utilized as appropriate. The following Revegetation Plan is excerpted from GMMV 1994:Volume 2, Appendix D.8, Vegetation.

3.2.1 Revegetation Plan

General Considerations. The surface of the permit area is managed by the BLM. The premining land uses are livestock and wildlife grazing, watershed, recreation, and mineral exploration. These uses are presently supported by Junegrass, Idaho fescue, king spike fescue, big sage, and black sage. Two plant communities are present. The sagebrush dominated community is the largest; the riparian plant community receives benefit of added waters. The riparian plant community is found only along three narrow drainages. Some willow and aspen are found in the riparian type, while scattered limber pine may be found on isolated ridges and north slopes.

Disturbance caused by actual mining will only affect the sagebrush plant community. Road building will affect a very small area of riparian plant community and will mostly be constructed within the sagebrush plant community. The sediment pond located below the mine waste pile will affect a small area of riparian vegetation. GMMV 1994:Volume 6, Appendix D.11, Wetland Study addresses the affected areas in detail.

Revegetation will utilize techniques to accomplish:

- stabilization of surface erosion within geologic limitations;
- achievement of plant cover comparable to premining conditions; and
- establishment of self-perpetuating vegetation consisting predominantly of native species.

3.2.2 Seed Mixtures

Because the predicted mine life is 20 years, it is impossible to accurately predict at this time the exact extent and nature of all geologic materials which will be reclaimed. Therefore, the following list of plants is proposed as a guide for correct species selection. The rate per species in pure live seed (PLS) is also noted as a guide; however, this rate may change depending on final seed mixtures. The total poundage of PLS seed should not be less than 20 and may be as much as 40 pounds of native grasses, depending on the seeding technique utilized.

<table>
<thead>
<tr>
<th>LIST OF PLANTS</th>
<th>PLS/Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indian ricegrass (<em>Oryzopsis hymenoides</em>) (Paloma cultivar)</td>
<td>2</td>
</tr>
<tr>
<td>Thickspike wheatgrass (<em>Agropyron dasytachyum</em>) (Cristana cultivar)</td>
<td>4</td>
</tr>
<tr>
<td>Streambank wheatgrass (<em>Agropyron riparium</em>) (Sodar cultivar)</td>
<td>4</td>
</tr>
<tr>
<td>Western wheatgrass (<em>Agropyron smithii</em>) (Rosana cultivar)</td>
<td>4</td>
</tr>
<tr>
<td>Slender wheatgrass (<em>Agropyron trachycaulum</em>) (Reneva cultivar)</td>
<td>4</td>
</tr>
<tr>
<td>Bluebunch wheatgrass (<em>Agropyron spicatum</em>) (Secor cultivar)</td>
<td>4</td>
</tr>
<tr>
<td>Green needlegrass (<em>Stipa viridula</em>) (Lodorn cultivar)</td>
<td>3</td>
</tr>
<tr>
<td>Idaho fescue (<em>Festuca idahoensis</em>)</td>
<td>3</td>
</tr>
<tr>
<td>Hard fescue (<em>Festuca ovina</em>) (Durs cultivar)</td>
<td>1</td>
</tr>
<tr>
<td>Basin wildrye (<em>Elymus cinereus</em>) (Magnar cultivar)</td>
<td>3</td>
</tr>
<tr>
<td>Wild blue flax (<em>Linum lewisii</em>)</td>
<td>1</td>
</tr>
<tr>
<td>Bitterbrush (<em>Purshia tridentata</em>)</td>
<td>1</td>
</tr>
<tr>
<td>Limber pine (<em>Pinus flexilis</em>)</td>
<td>1</td>
</tr>
</tbody>
</table>

ANNUALS FOR MULCH

| Winter wheat (*Triticum aestivum*) (Trapper cultivar) | 50       |
| Annual ryegrass (*Elymus sp.*) (Tetralblend cultivar) | 25       |

3.2.3 Seeding Practices

Seeding will generally be done during the fall; however, some areas such as critical locations or temporary storage sites may be spring seeded.

Several techniques of seeding may be used. Each technique will be selected to optimize revegetation of sites and utilization of equipment. Drill seeding, using a Rangeland drill, may be used on the restored road, while pitting may be necessary to revegetate the waste pile. Small isolated areas may be hand raked and broadcast. Bitterbrush and limber pine may be drill seeded, broadcast, or planted as containerized stock depending on the quality and quantity of adapted plant materials and on-site inspection of specific sites for planting.
3.2.4 Husbandry Practices

The area is grazed by livestock from May to December and water is available in Fourth Creek. Every effort will be made to promote successful revegetation through management; however, temporary fencing may be necessary. If fencing is necessary, smooth wire electric fence may be the desirable choice.

3.2.5 Postmining Grazing Practices

Wildlife will have access to the area; however, weather will be the primary factor which determines when the reclaimed areas can sustain grazing by livestock. GMMV will conduct specific evaluations (as discussed below under 3.2.7 Testing Adequacy of Reclamation) and inform interested parties. Because the area is so small in comparison to the total BLM allotment, special grazing practices are not possible following fence removal.

3.2.6 Restoration of Wildlife Habitat

The recommended species list (see Section 3.2.2, above) specifically includes species for winter use by wildlife. Sagebrush is not included in this mix because of the linear disturbance of the road which is bordered by both species of sagebrush and the lee slope of the waste pile, which has an upwind seed source. These seed sources will provide for more than an adequate supply of seed.

3.2.7 Testing Adequacy of Reclamation

Adequacy of reclamation will be tested by reassessment of transects established in 1987 and located on the vegetation map submitted with this application (GMMV 1994:Volume 1a, Maps). Future reassessment of the two vegetative types and comparison to revegetated sites will provide for variability of weather and produce the needed statistics to ensure that the revegetation effort is adequate as listed below:

- postmining cover comparable to premining cover;
- species composition and diversity capable of supporting the postmining land use;

4.0 EVALUATION OF RECLAMATION SUCCESS

GMMV 1994:Volume 2, Appendix D.8, Vegetation addresses evaluation of reclamation success (see Section 3.2.7 above) and follows those parameters as required in WDEQ-LQD Guideline No. 2. Wildlife habitat is described in GMMV 1994:Volume 2, Appendix D.9.

5.0 FINAL HYDROLOGICAL RESTORATION

5.1 DIVERSION DITCH

The diversion ditch immediately above the mine site will remain as part of the final reclamation plan. This will minimize erosional potential and migration of materials left in the reclaimed mine rock pile. The ditch will be designed to the required specifications to meet the criteria for a 100-year 6-hour event (see GMMV 1994:Volume 1, Mine Plan, Attachment D).

5.2 IMPOUNDMENTS

In the impoundment(s) utilized for holding and treating mine water, the synthetic impoundment liners will be disposed of according to the applicable regulation. The subsurface of the pond bottoms will be sampled and assayed for Radium 226, uranium, and spent barium chloride. If deleterious materials are found, they will be removed and disposed of according to the applicable regulations as discussed in Section 7.6. After requisite work is complete, the impoundment will be contoured and revegetated.

5.3 SEDIMENT DAM AND BASIN

The small catch basin below the mine will be tested in the same manner and reclaimed in a similar manner to that of the mine water impoundments.
6.9 POSTMINING GROUNDWATER AND SURFACE WATER MONITORING

GMMV will, during the postmining period, continue to monitor surface water, groundwater, and wetlands as outlined in the Monitoring Schedule (GMMV 1994:Volume 1a, Figure HY 15.1 and Hydrological Effect of Mining). The schedule of the locations, type of analysis, and frequency of sampling may be revised after the WDEQ and GMMV have evaluated any mining impacts and the success of any mitigation techniques employed.

Mitigation will be implemented in accordance with the prevailing WDEQ requirements and, based on results and any remaining deleterious effects to the ultimate land uses, mitigation measures and long-term hydrological restoration will be implemented with the guidance of the WDEQ. Monitoring will continue until the reclamation bond is released.

7.0 SPECIAL RECLAMATION STANDARDS

7.1 FACILITIES AND UTILITIES

All buildings will be dismantled and removed after mine production has ceased. The electrical power substation, water treatment facilities, energy dissipating structures, and associated hardware will be disassembled and 4 feet of suitable cover will be placed over concrete floors and foundations.

The water well and any holes drilled for the purpose of exploration will be plugged from bottom to top with bentonite and site material, capped with a 5-foot concrete plug, graded, and seeded per Section 3.2, Chapter XV, Rules and Regulations, WDEQ-LQD (1989). All utilities on site will be installed by the service companies through a BLM ROW permit. The respective service companies will abandon and reclaim any disturbance created by access routes, poles, lines, trenches, etc., per the stipulations of their permits. Any GMMV installed facilities and lines will be removed or abandoned in accordance with BLM requirements and/or WDEQ regulations.

7.2 ROADS

The BLM has requested that access be continued into the mine site area following mining. The cut-and-fill slopes along the road will be seeded during mining. Upon closure, culverts will be removed. The crossings will be reduced to 4:1 slopes. The cut-and-fill areas of the road will be returned to appropriate contours, graded, topsoiled, and seeded. This will allow for development of a two-track road similar to the premining condition. Any additional roads that may subsequently be required to access mine-related facilities will be reclaimed in accordance with these methods.

7.3 MINE ROCK PILE (SITE FILL AREA)

Any overburden material removed from site excavations and decline advancement will be placed in the site fill area to the limits as illustrated in GMMV 1994:Volume 1, Map M-1 and any excess will be placed in the Big Eagle pits. In addition, any mine rock from the underground mining operations not placed underground will be placed in one of the Big Eagle pits. This material may have a wide range of chemical and physical properties. Care will be taken to ensure that these materials do not contaminate topsoil and subsoil stockpiles.

The mine rock material will be examined periodically, as different formations are encountered, for potential toxicity to plant growth. Field analysis will assist in proper placement of materials within the mine rock pile to ensure that future plant growth is not harmed. Postmining sampling will include the entire thickness of the rock pile. Complying during the mining operation with the recommendations of the "Acid Rock Generation Potential of Mine Rock" report by KEA Pacific dated October 1993 (see GMMV 1994:Volume 1, Attachment 9) will minimize the potential for any of this type of material being present.

Prior to topsoiling the final surface of the rock pile, the pile will be sampled to a depth of 4 feet on the basis of one sample location per acre, on an approximate 200 x 200 foot grid as approved in the License to Exploit 179LE. These samples will be analyzed in conformance with WDEQ-LQD Guideline No. 1 for overburden stability. Toxic, acid-forming, or radioactive materials, as defined in WDEQ Rules and Regulations, March 9, 1989, will be monitored and disposed of in certain areas of the dump and covered with suitable surface overburden material. Additional sampling will be completed on a closer grid pattern.
to further delineate toxic areas if problems are found in the initial holes. On final reclamation, suitable surface overburden will be taken from an appropriate borrow area on the dump and layered a minimum of 4 feet over any remaining toxic, acid-forming, or radioactive material prior to topsoil replacement. Reclamation will proceed in accordance with GMMV 1994:Volume 2, Appendix D.7, Soils, Appendix D.8, Revegetation Plan, and Map R-1.

7.4 MINE DECLINES AND OTHER SURFACE OPENINGS

No surface subsidence is anticipated as a result of the mining operation (see GMMV 1994:Volume 1, Mine Plan, Section 1.6, Underground Mine Plan, Portals). Upon reclamation, the steel, concrete, and rock bolts of the portals will remain in place. The concrete embankment face surrounding the portals will be partially broken up to prevent a potential slip zone between the concrete face and backfill material. The backfill materials will be placed and contoured in such a manner to preclude any major settlement or sharp topographic feature in the area. A concrete bulkhead will be installed at each portal and 100 linear feet of each of the declines will be sealed by filling with a compacted blend of suitable mine rock material and bentonite. The planned backfilling of surface openings will eliminate the possible long-term mine land subsidence in the areas adjacent to the openings to the surface. The zone of caving along the decline is calculated to be a maximum of 9 feet above the portal back, in the section between elevation 7,910 to 7,902 feet. The maximum caved zone above the portals would be from elevation 7,910 to 7,919 feet. The surface topography above the portal in this decline section is at elevation 7,940 to 7,955 feet, which would preclude any surface manifestation due to caving.

The portal surface areas will be backfilled for a minimum of 100 feet and at no more than a 3:1 slope. Overburden will be placed over the area and contoured to blend with the adjacent topography.

If aquifers of differing water qualities are encountered in the declines, each major water producing zone of differing water quality will be isolated to prevent the co-mingling of such aquifers after completion of mining. This will be accomplished by backfilling and erecting low permeability barriers (bulkheads).

7.5 LOW GRADE STOCKPILES

During operations and as an operating expense, low grade ore will be 1) blended and shipped with higher grade ore to the mill; 2) located with the existing Big Eagle low grade piles; 3) deposited in the Big Eagle pits; or 4) transferred back underground. The reclamation costs include the depositing of approximately 50,000 cubic yards of the 220,000 cubic yards (300,000 tons) estimated maximum stockpile amount.

7.6 SLUDGE DISPOSAL

The sludge disposal from impoundments will be handled and placed in such a manner that the sludges will be isolated from groundwater. The final area of disposition will dictate the handling and placement requirements.

Areas of final sludge disposal that will be considered include:

- the uranium processing facility, where it would be run through the process or deposited directly into the tailings facility;
- the underground mine workings;
- the Big Eagle pit, where it would be buried in the spoil pile 20 feet or more above groundwater and covered with a minimum of 4 feet of suitable material; and
- burial in place.

8.0 RECLAMATION OF MILL SITE

The ore taken from the mine will be transported to the existing permitted Sweetwater Uranium Mill, owned by the GMMV. This facility is operated under NRC Source Materials License #SU1350. The NRC License has provisions regarding the decommissioning and reclamation of the total mill site. Reclamation of the Sweetwater Uranium Mill facility is not applicable to this mining permit.

9.0 RECLAMATION SCHEDULE

Except for the mine site cut-and-fill areas, the only additional surface disturbances that will occur are the sites of mine ventilation openings to the surface as the mine progresses. The site fill areas will be
periodically maintained to a 4:1 slope to minimize erosion and the pile will undergo stabilization measures at regular intervals as the amount of material dictates. No other ongoing reclamation is scheduled during the mining phase. Final reclamation will proceed as soon as possible after mining operations terminate and within 180 days of final mine closure.

If economic conditions exist that merit Interim Stabilization, a request will be made in accordance with applicable WDEQ-LQD regulations.

Final reclamation with regard to hydrology, soil, vegetation, wildlife habitat, and radiology is further addressed in GMMV 1994: Volume 2, Appendices D.6, D.7, D.8, D.9 and D.10, respectively.

10.0 RECLAMATION COSTS

Current Planned Disturbance

Current estimated costs for reclamation are listed below. All costs for reclamation are based on third party completion. Costs for seedbed preparation, seed, and drill seeding with a Rangeland drill will remain constant for all areas once the area is contoured and void of buildings, concrete, substation, and all other facilities.

Cost Basis

a) SEEDING:
- Ripping and fine grading $70.00 per acre
- Discing $40.00 per acre
- Seed, $2.50/1b at 20 lbs/acre $170.00 per acre
- Drill seeding (price includes operator, tractor, Rangeland drill and mobilization) $35.00 per acre

SEEDING - TOTAL COST PER ACRE $315.00 per acre

b) EARTHWORK (to bring grades to reclaimed topography) $1.00 per cubic yard

c) TOPSOIL (handling, spreading and prepared for seeding) $0.85 per cubic yard

d) DECLINE BULKHEADS (consists of mine rock and bentonite with cement; 2 plugs 16 feet wide x 17 feet high x up to 100 feet long at each location) $2.00 per cubic yard

e) WELLS, filled bottom to top with bentonite/earthen mix
- Shallow wells < 100 feet deep $100.00 per hole
- Deep well > 100 feet deep $300.00 per hole
- Ripping, discing, seeding $160.00 per location

Reclamation Costs

1) ACCESS ROAD & ROAD TOPSOIL STORAGE AREAS:
- Earthwork: See Notes 1 and 2 $46,041
- Topsoil: 44,800 cubic yards at $0.85/cubic yard $38,080
- Seeding: 34.4 acres at $315 per acre $10,836
- Culvert removal (14 at 1,400 feet each): 1,400 feet at $5/foot $7,000

2) OTHER MINE ROADS, SUBSTATION & WATER TANK:
- Earthwork - Substation $500
- Earthwork - Water tank $200
- Earthwork - Mine roads, see Note 3 $2,777
- Topsoil - 726 cubic yards at $0.85/cubic yard $620
- Seeding - 0.6 acre at $315/acre $189

3) MINE SITE AREA / MINE ROCK PILE:
- Earthwork - Portal backfill-off area 25,036 cubic yards at $1.00/cubic yard (includes building areas) $25,036
- Topsoil - 83,570 cubic yards at $0.85/cubic yard $71,034
- Seeding - 41.2 acres at $315/acre $12,978
- Earthwork - cover hotspots, see Note 4 $12,592
- Earthwork - mine water ponds, 8,333 cubic yards at $1/cubic yard $8,333

4) SEDIMENT DAM:
- Earthwork - 3,500 cubic yards at $1.00/cubic yard $3,500
- Topsoil - 14,681 cubic yards at $0.85/cubic yard $12,480
- Seeding - 3 acres at $315/acre $945

5) MINE FACILITIES (see Note 6)
- Remove 240,000 cubic feet $60,000
- Remove substation $1,000
- Remove piping, dissipating structure, and misc. $2,500
- Portal seal - backfill declines (2) (18 x 18 feet arched x 100 feet each) 2,140 cubic yards $2,140
- Portal seal - double concrete bulkheads $8,000

6) DECLINE BULKHEADS (assumes 5 locations)
- Installing plugs at $4,000 each location (includes two concrete bulkheads each location) $20,000
### GMMV Jackpot Mine Final EIS

#### 7) MOBILIZATION and DEMOBILIZATION (assume 70 miles away)

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crane - 3 hours at $120/hour</td>
<td>$360</td>
</tr>
<tr>
<td>Truck and lowboy - 5 trips, 3 hours at $120/hour each</td>
<td>$1,800</td>
</tr>
<tr>
<td>3 Scrappers - 3 hours at $120/hour each</td>
<td>$1,080</td>
</tr>
<tr>
<td>5 cubic yard wheeled loader - 3 hours at $120/hour</td>
<td>$360</td>
</tr>
<tr>
<td>Tractor, disk, and spreader - 3 hours at $120/hour</td>
<td>$360</td>
</tr>
<tr>
<td>Dozer - 3 hours at $120/hour</td>
<td>$360</td>
</tr>
<tr>
<td>Patrol - 3 hours at $120/hour</td>
<td>$360</td>
</tr>
<tr>
<td>Truck and trailer - 3 hours at $120/hour</td>
<td>$360</td>
</tr>
</tbody>
</table>

#### 8) RETENTION PONDS - WATER TREATMENT (see Note 5)

- Remove IX building
- Remove IX equipment
- Remove BaCI building (24 x 28 x 12 feet)
- Remove BaCI equipment
- Remove sludge from Pond 2, assume disposal at Big Eagle:
  - 1,600 cubic yards sludge at $1.00/cubic yard | $1,600 |
  - Haulage $0.20/ton mile @ 3 miles | $1,410 |
- Earthwork - backfill Ponds 1 and 2
  - (8,200 + 3,000) = 11,200 cubic yards at $1.00/cubic yard | $11,200 |
- Topsoil - 4,200 cubic yards at $0.85/cubic yard | $3,570 |
- Seed - 2 acres at $315.00/acre | $630 |

#### 9) LOW GRADE STOCKPILES

50,000 cubic yards or 1,350,000 cubic feet or 67,500 tons

- Transfer to Big Eagle at $0.20/ton mile @ 3 miles, or $360
- Transfer underground at $1.00/cubic yard | $50,000 |

#### 10) MONITOR WELLS and STATIONS (see Note 7)

- 12 deep wells at $460 each | $5,520 |
- 21 shallow wells at $260 each | $5,460 |
- Remove equipment at mine discharge point | $1,000 |
- Remove sediment station | $1,000 |
- Remove weather station | $500 |
- Remove parshall flumes | $1,500 |

**SUBTOTAL** | $435,261

**20% Contingency** | $87,052

**TOTAL BOND REQUIRED** | $522,313

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1 20% Contingency fee includes agency administration and supervision costs.

### Additional Areas

If additional surface areas are subsequently disturbed because of mining activities, the reclamation cost estimate, and consequently, the required reclamation bonding will be increased accordingly.

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**NOTE 1:** 3,200 feet of road length x 100 feet wide requires filling an average cut of 6 feet on one side of road with 6 feet of fill material from the opposite side. 30,222 cubic yards

**NOTE 2:** 10,050 feet of road length x 100 feet wide requires moving approximately 6 inches of roadway material to fill ditches, minor side slopes, and blend to topography in preparation of receiving topsoil. 18,611 cubic yards

**NOTE 3:** 2,000 feet of mine roads 15 feet wide requires filling an average 5 feet of cut with 5 feet of fill from the opposite side. 2,777 cubic yards

**NOTE 4:** Most earthwork required to obtain final reclaimed topography will be completed as the mine is being operated. The area requiring a 4 foot cover is estimated to total 2 acres. (85,000 x 4 feet) = 12,592 cubic yards

**NOTE 5:** Exact size of buildings and equipment, or if they will be required, are not known at this time. Bonding will be adjusted yearly as facility requirements are determined.

**NOTE 6:** Assume 20,000 square feet of buildings, 12 feet high. Removal cost per building construction costs data of $0.25/cubic feet.

**NOTE 7:** $460.00 each location includes: 0.5 acres per site; holes filled with bentonite/earthen mixture from bottom to top; site ripped, disced, and seeded; and surface pipe removed.
DISCOVERIES DURING MINING

If any cultural materials are discovered during construction or mining, work in that area will be halted and appropriate individuals from the WDEQ-LQD, BLM, and SHPO will be contacted.

Copies of the confidential reports are available on request by the agencies.

2.7.8.2 Reclamation Soil Profile

The depth of suitable topsoil and suitable overburden materials which must be placed over any unsuitable materials is dependent on the soil texture and the amount of precipitation occurring during the nongrowing season. Determination of this soil depth is necessary in order to restrict the upward movement of undesirable materials (i.e., acids, sodium, and salts) and to maintain successful long-term reclamation of the area.

GMMV 1994: Volume 2, Section D.7, Figure D-7.5 illustrates the depths of soil water (in a year 20% wetter than normal) that must be stored in the profile for consumption by plants during the growing season (May through September). The maximum estimated water storage requirement for the mine site is approximately 4.56 inches for a year with precipitation 20% above normal.

An estimated 70 inches of sandy loam soil will be used to construct the reclamation soil profile in the mine site area in order to store the 4.56 inches of soil water (GMMV 1994: Volume 2, Section D.7, Figure D-7.6). The upper 22 inches of the reclamation soil profile will consist of stockpiled topsoil (this depth is based on the projected amounts of suitable topsoil that may be available). The actual depth of topsoil will be adjusted during construction by the certified professional soil scientist in order to maximize the benefits of this valuable resource and to increase the chances of successful reclamation. The remaining 48 inches of material will consist of suitable overburden material. This depth requirement of suitable topsoil and suitable overburden corresponds to the rooting depths in adjacent native soils, which are free of restrictive soil layers. These minimum soil depths will be adjusted by a certified professional soil scientist during reclamation in order to account for variations in soil texture and percent coarse
fragments. These estimated soil reclamation depths are based on the assumption that the site does not have any areas where surface water accumulates. The design of the final reclamation surface should avoid development of areas where excessive surface runoff or accumulation can occur.

The roadway area will be reclaimed by replacing the stockpiled topsoil to depths similar to those which existed prior to disturbance. An exact depth for the reclamation profile is not as critical in the roadway area as on the mine site, since there were not any unsuitable materials observed in the native soils. A certified professional soil scientist will direct the replacement of topsoil in order to achieve the maximum benefit from this valuable resource and to increase the chances for successful reclamation.

**Summary**

Reclamation and revegetation goals will be:
- stabilization of surface erosion within geologic limitation;
- achievement of plant cover comparable to premining conditions; and
- establishment of self perpetuating vegetation consisting predominantly of native grasses.

**MINE PLAN**

1. Fencing is presently not contemplated, except as may be needed for security around the immediate building and/or portal area. Security fence, if utilized, will be chain link. Temporary protective fencing for revegetation is proposed to be two-wire electric fence. Wire will be spaced from the ground so as not to restrict movement by wildlife. This type of fence will be used if it is necessary to protect establishing vegetation from livestock. Power lines to the portal and office complex are permitted by Pacific Power.

2. There are no known raptor nests within one mile of disturbance areas.

3. Prior to disturbance of any new or existing raptor nests, a special purpose permit shall be obtained from the WGF and USFWS. A mitigation plan shall be developed in conjunction with each nest to be disturbed, and shall be submitted to the USFWS for approval.

**RECLAMATION PLAN**

A. Vegetative habitat components disturbed by mining

<table>
<thead>
<tr>
<th>Vegetative Type</th>
<th>Acres</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sagebrush</td>
<td>61.5</td>
<td>93</td>
</tr>
<tr>
<td>Riparian</td>
<td>4.5</td>
<td>7</td>
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<tr>
<td>Characteristic Sagebrush Type</td>
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<td></td>
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<tr>
<td>Grasses</td>
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</tr>
<tr>
<td>Shrubs</td>
<td>7.4</td>
<td></td>
</tr>
<tr>
<td>Forbs</td>
<td>8.5</td>
<td></td>
</tr>
<tr>
<td>Trees</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Bare</td>
<td>72.0</td>
<td>100</td>
</tr>
<tr>
<td>Characteristic Riparian Type</td>
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<td></td>
</tr>
<tr>
<td>Grasses</td>
<td>48.0</td>
<td></td>
</tr>
<tr>
<td>Shrubs</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>Forbs</td>
<td>11.0</td>
<td></td>
</tr>
<tr>
<td>Bare</td>
<td>35.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Reclamation of the access road and sediment basin will restore the premining balance of revegetated windswept slopes and ridges, lee slopes and all of the riparian vegetation.
Reclamation of the mine area complex will restore only a portion of the premine windswept slopes and lee slopes.

At completion of operations, the surface of the waste pile will probably be mostly level, with a gentle 4:1 grade on the slopes. Thus, a major portion of the waste pile will be changed to a nearly level surface. The level and sloped areas will cover approximately 37 acres and will be planted to grasses.

WILDLIFE MONITORING PLAN

The wildlife monitoring program has been designed to comply with the written WDEQ comments of Mr. John Erickson of April 23, 1993, and the verbal recommendations of WGFD compliance specialist, Mr. Steve Tessmann.

Big Game

One big game ground survey will be conducted annually under suitable snow conditions during the January/February period. The first survey shall include the entire Permit Area except those areas where a 1-mile radius from the edge of the disturbance area exceeds the permit boundary. In such areas, the coverage will be limited by the Permit Area boundary or a 1-mile radius from the edge of the disturbance area, whichever is greater. This survey shall also include the access road plus a 1/2-mile margin on either side. Subsequent annual surveys shall include only the disturbance area plus a 1-mile radius, and the access road plus a 1/2-mile margin on either side. Locations of all animals observed shall be recorded by habitat type and legal description, and plotted on a topographic map.

Raptors

Annual nesting raptor and production surveys shall be conducted on the disturbance area plus a 1-mile radius. The activity and productivity of all known nest locations will be inspected each year, and suitable habitats searched to locate new or previously unrecorded nest sites.

Sage Grouse

A survey will be conducted to determine whether or not sage grouse leks occur within potentially suitable habitats within a 1/2-mile margin on either side of the access road and within a 1/2-mile radius to the south of the disturbance area. This survey will be conducted twice: once during late March, and again in early April. Lek attendance records will be made and will include numbers of males and females in attendance. If no leks are found during these surveys, no further sage grouse surveys of any kind will be performed during subsequent years.

Fish

One survey to determine the occurrence of fish species in the flowing streams that are likely to receive discharge waters or which could be affected by potential dewatering events will be conducted during the fall of 1993. After a scientific collectors permit is obtained from the WGFD, fish will be hand-seined, or stunned with an electrofishing gun where necessary, identified, and returned to the stream. Sample composition, and length/weight frequency classes will be determined.
6.1 REGULATION AND PERMITTING

The regulation of jurisdictional wetlands and the permitting of activities that involve discharge of dredge and fill into jurisdictional wetlands are discussed in detail in GMMV 1994: Volume 6, Appendix N.

All attempts should be made to avoid surface-disturbing activities on all wetlands. If it is not possible to avoid all wetlands with project facilities, then impacts should be minimized. Further, the applicant will likely be required by the COE to demonstrate that no practicable (economic and/or physical) alternatives are available that would avoid wetlands and/or further minimize wetland impacts. Once this is demonstrated, project permitting and discussion on planning for mitigation could proceed.

The guidelines place great importance on the term "practicable". Within the context of the guidelines, there are four components of a practicable alternative: 1) physical availability, 2) feasibility of implementation, 3) cost, and 4) other environmental and socioeconomic concerns. Therefore, for an alternative to be practicable, it must be physically available to the applicant, feasibly implementable, cost effective, and without greater environmental or socioeconomic impact.

6.2 MITIGATION

Should wetlands mitigation become a requirement of project implementation, mitigation should be considered in the following priority from highest to lowest: 1) avoidance; 2) impact minimization; 3) mitigation in-kind, on-site; 4) mitigation in-kind, off-site; 5) mitigation out-of-kind, on-site; and 6) mitigation out-of-kind, off-site. In addition, the following modes of mitigation, listed in order of preference, may be implemented for wetlands mitigation if avoidance and impact minimization are not practicable: 1) wetlands restoration, 2) wetlands creation, and 3) wetlands enhancement. Only after it is demonstrated that total avoidance and impact minimization are not feasible should other mitigation strategies be considered. The general objective and goal of mitigation should include replacement of functional values and cumulative area lost due to project implementation.
PUBLIC MEETING, JULY 18, 1995
JACKPOT URANIUM MINE
DRAFT ENVIRONMENTAL IMPACT STATEMENT
PLEASE PRINT

<table>
<thead>
<tr>
<th>NAME</th>
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<th>REPRESENTING</th>
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<tr>
<td>Jane Simmons</td>
<td>11301 Cherokee</td>
<td>Teton County</td>
<td>No</td>
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<tr>
<td>Kent Brown</td>
<td>8406 S. Helen</td>
<td>Teton County</td>
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<tr>
<td>Jack Harris</td>
<td>1710 W. Plant</td>
<td>Teton County</td>
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</tr>
<tr>
<td>Dick Jackson</td>
<td>2328 Ponder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>John Johnson</td>
<td>7125 N. Market</td>
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<tr>
<td>Mary Johnson</td>
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<tr>
<td>Joe Smith</td>
<td>4205 S. Farm</td>
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<tr>
<td>Tom Peterson</td>
<td>1004 Twin Lane</td>
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<td></td>
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<tr>
<td>Bill Greene</td>
<td>600 S. 5th Ave</td>
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PUBLIC MEETING, JULY 19, 1995
JACKPOT URANIUM MINE
DRAFT ENVIRONMENTAL IMPACT STATEMENT
PLEASE PRINT

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<tr>
<td>Pat Garrett</td>
<td>605 Studebaker</td>
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<tr>
<td>Cesar A. Pizarro</td>
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<td>Judy Garrett</td>
<td>350 N. Market</td>
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<td>Bob Adams</td>
<td>4800 N. Market</td>
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<td>Mark Thompson</td>
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<tr>
<td>Jim Thompson</td>
<td>370 W. 5th Ave</td>
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<td>Pat Greene</td>
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**PUBLIC MEETING, JULY 19, 1995**

**JACKPOT URANIUM MINE**

**DRAFT ENVIRONMENTAL IMPACT STATEMENT**

**PLEASE PRINT**

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<tr>
<td>Joe Smith</td>
<td>123 Main St.</td>
<td>EDC</td>
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<td>Tony Johnson</td>
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<td>Bill Anderson</td>
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<td>Mark Davis</td>
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<td>Sue Brown</td>
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<tr>
<td>Mary Jackson</td>
<td>678 Maple Ave.</td>
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<td>Lisa Taylor</td>
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<td>John White</td>
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<tr>
<td>Jessica Smith</td>
<td>756 Cedar Ln.</td>
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</tr>
<tr>
<td>David Brown</td>
<td>432 Elm St.</td>
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**PUBLIC MEETING, JULY 20, 1995**

**JACKPOT URANIUM MINE**

**DRAFT ENVIRONMENTAL IMPACT STATEMENT**

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<tr>
<td>John Smith</td>
<td>456 Oak Ave.</td>
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<tr>
<td>Jane Doe</td>
<td>789 Pine Rd.</td>
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<tr>
<td>Mike Johnson</td>
<td>567 Elm St.</td>
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<td>Sarah Lee</td>
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<td>David Brown</td>
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<td>Jessica Smith</td>
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<td>David Brown</td>
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<td>Jane Doe</td>
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**PUBLIC MEETING, JULY 24, 1995**

**JACKPOT URANIUM MINE**

**DRAFT ENVIRONMENTAL IMPACT STATEMENT**

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<th>REPRESENTING</th>
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</tr>
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<tr>
<td>Pete Green</td>
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<td>John Smith</td>
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<td>Yes</td>
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<td>Jane Doe</td>
<td>789 Pine Rd.</td>
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<tr>
<td>Mike Johnson</td>
<td>567 Elm St.</td>
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<td>Yes</td>
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<tr>
<td>Sarah Lee</td>
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<tr>
<td>David Brown</td>
<td>678 Maple Ave.</td>
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<tr>
<td>John White</td>
<td>908 Birch St.</td>
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<td>Jessica Smith</td>
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<td>David Brown</td>
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<td>Jane Doe</td>
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<td>TRC</td>
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</table>
8.1 Record of Proceedings
JACKPOT MINING PROJECT
ENVIRONMENTAL IMPACT STATEMENT
PUBLIC MEETINGS
JULY 15, 16, 19, 1993

8.1.2 Record of Proceedings

Larry Bauer, my name is Larry Bauer and I have been selected to be the
chairperson for the organization of the Jackpot Mine Project. I
will be the project manager at the Jackpot Mine Project.

I propose that we begin by identifying the problem or issue that we
will address in this meeting. Once we have identified the problem or
issue, we will then discuss the possible solutions or alternatives
that could be implemented.

Alternatives in 16 are the most direct one. It involves the
removal of one of the Big Eagle Mine and the McEwen-type
mine, a very large amount of soil material and the
removal of the existing tailing facility. This will be
the least expensive alternative.

Alternatives in 16 involve less amount of soil material
and the existing tailing facility. This will be
more expensive than alternative 16.

Alternatives in 16 involve even less amount of soil material
and the existing tailing facility. This will be
the most expensive alternative.

Alternatives in 16 involve the removal of one of the
Big Eagle Mine and the McEwen-type mine, a
very large amount of soil material and the
removal of the existing tailing facility. This
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the least expensive alternative.

Alternatives in 16 involve less amount of soil material
and the existing tailing facility. This will be
more expensive than alternative 16.

Alternatives in 16 involve even less amount of soil material
and the existing tailing facility. This will be
the most expensive alternative.
5. Unnamed Email Address - I am not sure if I am comment or if I am sure that you are doing this. I can see that you are doing something about the DEIS and the time to review the DEIS and providing your comments. I believe that the comments would not be made in a time-efficient manner. I think that it would be best to have comments made online and in a timely manner.

Table 8.1 Approximate Mine Access and Ore Haul Route Costs, GMMV Jackpot Mine Project, Fremont and Sweetwater Counties, Wyoming, 1995.1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Alternative A</th>
<th>Alternative B and C (combined)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mine Access</td>
<td>9.2 miles</td>
<td>9.2 miles</td>
</tr>
<tr>
<td>Construction</td>
<td>$92,000</td>
<td>$92,000</td>
</tr>
<tr>
<td>Maintenance</td>
<td>$1,012,000</td>
<td>$1,012,000</td>
</tr>
<tr>
<td>Reclamation</td>
<td>$28,000</td>
<td>$28,000</td>
</tr>
<tr>
<td>Subtotal</td>
<td>$1,152,000</td>
<td>$1,152,000</td>
</tr>
<tr>
<td>Ore Hauling</td>
<td>28.7 miles</td>
<td>21.7 miles</td>
</tr>
<tr>
<td>Construction</td>
<td>$2,540,000</td>
<td>$3,689,000</td>
</tr>
<tr>
<td>Maintenance</td>
<td>$1,894,000</td>
<td>$1,432,000</td>
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<tr>
<td>Operations</td>
<td>$35,875,000</td>
<td>$27,125,000</td>
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<tr>
<td>Reclamation</td>
<td>$106,000</td>
<td>$250,000</td>
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<tr>
<td>Subtotal</td>
<td>$40,115,000</td>
<td>$39,766,000</td>
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<tr>
<td>GRAND TOTAL</td>
<td>$41,247,000</td>
<td>$35,988,000</td>
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1 Data provided by GMMV.
2 Includes the Jackpot Mine, Anaconda, and the Big Eagle Roads.
3 Only the 2.3 miles of Jackpot Mine Access Road would require construction (upgrading) and reclamation.
4 Includes grading, paving, and dust abatement for 25 and 15 years for mine access and ore hauling, respectively.
5 Includes only the reclamation costs for the 8.4 miles of the Alternative B and C road segments.

8.1.3. BLM Responses to Public Meeting Comments

Comment: 1. Susan Jackson - Thank you for taking the time to review the DEIS and providing your comments. 

Comment: 2. Bob Peck - Thank you for taking the time to review the DEIS and providing your comments. 

Comment: 3. All - Thank you for taking the time to review the DEIS and providing your comments. 

Comment: 4. Unidentified Speaker - Thank you for taking the time to review the DEIS and providing your comments. 

Comment: 5. Barney Conway - Thank you for taking the time to review the DEIS and providing your comments. 

Comment: 6. Sean McMahon - Thank you for taking the time to review the DEIS and providing your comments. 

Comment: 7. Ed Hewett - Thank you for taking the time to review the DEIS and providing your comments. Please see Comment 4, above. 

Comment: 8. Bill Vasey - Thank you for taking the time to review the DEIS and providing your comments. 

Comment: 9. Bob Dahi - Thank you for taking the time to review the DEIS and providing your comments; your comments on haul road safety and efficiency are noted. Please see Section 4.4 of the DEIS. 

Comment: 10. Bob Timper - Thank you for taking the time to review the DEIS and providing your comments; your comment on haul roads is noted.

Comment: 11. Unidentified - Thank you for taking the time to review the DEIS and providing your comments. An alternative involving the abandonment and reclamation of the existing county road was not considered. The BLM believes that impacts as identified for the Proposed Action and Alternative A haul routes would be consistent with your suggested alternative.

Comment: 12. All - Thank you for taking the time to review the DEIS and providing your comments. Please see Comment 4, above. All required county permits would be obtained (see DEIS, Section 1.3). 

8.2 COMMENT LETTERS AND BLM RESPONSES

Sixty comment letters (57 commentors) were received on the DEIS (Table 8.2). These comment letters and BLM responses are presented below.
Table 8.2 Comment Letters Received on the DEIS for the Jackpot Mine Project, Fremont and Sweetwater Counties, Wyoming, 1995.

<table>
<thead>
<tr>
<th>Commentor</th>
<th>Chapter Location</th>
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<tr>
<td>U.S. Bureau of Reclamation</td>
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<tr>
<td>Rice Enterprises</td>
<td>8.2.2</td>
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<td>U.S. Fish and Wildlife Service</td>
<td>8.2.3</td>
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<tr>
<td>Riverton Community Development Association</td>
<td>8.2.4</td>
</tr>
<tr>
<td>Wyoming State Legislature, Senator Robert A. Peck</td>
<td>8.2.5</td>
</tr>
<tr>
<td>Leo J. Chapman</td>
<td>8.2.6</td>
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<tr>
<td>Rawlins Newspapers, Inc.</td>
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<td>Big Country Chiropractic Center (2 letters)</td>
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<td>Michael Schoenfeld</td>
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Table 8.2 (Continued)

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<td>Mary Keller</td>
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<td>Jack Van Baalen</td>
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Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

Comment: 1. The text has been changed (see modifications to Chapter 6.0 in this FEIS).

Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

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Comment: 5 - The BLM agrees that the loss of habitat through direct disturbance would not be the only impact to wildlife; however, it is likely the predominate adverse impact to most species. Please feel free to contact our office to discuss further cumulative impact evaluations.

Comment: 6 - Although the BLM has no scientific evidence to demonstrate that a loss of some percentage of crucial habitat would result in a significant impact to any species, this threshold was used as a prudent measure to judge the severity of potential project impacts. In the absence of other, substantiated criteria, BLM utilizes the percentage loss criterion to prompt a more in-depth analysis of potential impacts (i.e., preparation of an EIS). Once the set percentage is reached, all subsequent impacts would be considered significant and, therefore, weighted most heavily during the decision-making process. Hard objectives are used as significance criteria since they provide an annually quantified measurement of big game herd populations in the vicinity of the project.

Comment: 7 - See Comments 1 and 4, above.

Comment: 8 - See Comment 3, above. The BLM has determined through our review that with the application of mitigation measures as specified in this EIS, long-term impacts to raptor nesting as a result of this project would be negligible.

Comment: 9 - In the event of a spill, GMVV would notify all those agencies and individuals as required by law or regulation. If the USFWS desires notification, they should contact the WDEQ or other relevant agency to establish notification protocol.

Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

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Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments. Your support of the direct haul route (Alternative A) is noted.
The Sweetwater County Engineer's Office

Dear Mr. Estes:

This Board of County Commissioners of Sweetwater County supports the development of the Jackpot Mine Project within Wyoming and Sweetwater County. The continued development of our mineral resources ensures the vitality of our area's economy, providing jobs and the resources which, in turn, support needed services.

The lack of the increase in the lower today's development happens to simply encourage the production companies involved to mine all accessible interior, state and county claims on or around the project in a manner which would not have been possible without the plant's expansion to keep up with the demand we now will have.

The Sweetwater County Commissioners appreciate the opportunity to comment on the project and begin to work as early as possible with the State of Utah in further the responsible development of our county.

Sincerely,

[Signature]

Lesley R. Tellefson

Sweetwater County Commissioners

8.2.12 Sweetwater County Department of Staff Resources and Technical Services

[Image of a page from a document with text]

Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments. All necessary federal, state, and county permits will be obtained by GMMV (see DEIS, Section 1.3).

8.2.13 Judeon H. Whitman

[Image of a page with a letter and a signature]

Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

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Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

Comment 1 - All scoping comments were considered during the preparation of the DEIS. Comments not specifically discussed in the DEIS were considered by the BLM IDT; however, the IDT determined that a discussion of these comments was not necessary in the EIS document. A summary of scoping comments is provided in EIS Section 1.4.

Comment 2 - The term "standard procedures" was used to summarize the information presented in DEIS, Chapter 2.0. The summary, as described by 4 CFR 150.12, provides a discussion of the entire EIS "to stress the major conclusions, areas of controversy (including issues raised by agencies and the public), and the issues to be resolved (including the major choice among alternatives)." As none of the standard procedures involved with the project are specifically one of the aforementioned points, they are not identified individually in the summary, but are discussed within the text of the DEIS.

Comment 3 - The word "wildlife" has been added to the sentence (see revised Executive Summary in this FEIS).

Comment 4 - The EIS identifies impacts the mine would have on groundwater resources without dramatizing the facts by merely presenting a range of values representing the potential total volume withdrawn over the life of the project. In fact, the total volume of water pumped out during mining is not the focus of the analysis, since there are no current groundwater users of these waters, and GMM has obtained an appropriation for groundwater quantities in excess of volumes anticipated to be withdrawn. Areas of principle analysis are the potential impacts to surficial hydrologic features (i.e., seeps, springs, meadows, etc.) that may rely on groundwater, and the flow rates at which groundwater is released and potential impacts to drainages. The BLM believes that the analysis of potential hydrologic impacts as presented in this EIS is correct and with the application of mitigations committed to by GMM (1994 Volume 1 and 1a), all impacts to groundwater and most impacts to surface water would be negligible.

Comment 5 - Comment noted.

Comment 6 - The sentence immediately following the LPMA reference specifically points out that the regulations allowing development also require minimizing environmental impacts, providing for reconciliation, and requiring compliance with other federal and state laws and regulations.

Comment 7 - GMM is committed to all mitigation and monitoring measures identified in this EIS, as well as those contained in their permit application (GMM 1994). In addition, the BLM will require implementation of mitigations identified for public lands. However, there may be situations encountered during project development which under normal circumstances would require mitigation or monitoring measures, but for which these measures are unnecessary since the resources themselves were impacts already identified that the measures were initially developed would be adequately protected.

Comment 8 - The existing county ROWs (Right-of-Way) for the Crooks Gap/Wasson Road (Fremont County Road 318, Sweetwater County Road 238) would be used for the proposed action with no new ROWs to be realigned. However, there may be situations encountered during project development which under normal circumstances would require mitigation or monitoring measures, but for which these measures are unnecessary since the resources themselves were impacts already identified that the measures were initially developed would be adequately protected.

Comment 9 - State and regional Army Corps of Engineers offices were issued copies of the DEIS; no comments were received from the agency.

Comment 10 - All scoping comments received by the BLM were considered during the preparation of this EIS (see Comment 1, above). Your remaining comments concerning procedural practices can be addressed as follows:

- The project would not be subject to NEPA requirements (40 CFR 1500.5(e), 1501.7(b)(2), and 1501.8(b)(2) concerning limiting the time periods for comments or other
components of the EIS. The scoping process is to be an "open" process in that it should encourage participation; not "open" as in unending.

Comment: 11 - All extract disturbances at the Big Eagle, Sheep Mountains, Crooks Gap, and Sweetwater Mines were included in this cumulative impact assessment. Future disturbances at these mines are unknown and were not assessed. In the event these mines do become reactivated and NEPA analyses are required, the cumulative impacts from these mines in combination with those of the Jackpot Mine would be assessed.

Comment: 12 - The text has been modified to indicate that 40,000 tons of UO₃ may be present in the Jackpot Mine location (see modifications to Section 2.1.2.1, in this FEIS).

Comment: 13 - Cumulative impacts from all existing and proposed disturbances are assessed in the DEIS, Chapter 4.0.

Comment: 14 - Because the need for and locations of additional air intake and exhaust drifts is unknown at this time, they are not included in this assessment. If additional air intake or exhaust drifts are required, additional NEPA analyses would be conducted as required, based on BLM and WDEQ-LQD evaluations regarding the significance of associated impacts. The BLM would locate any required air intake and exhaust drift facilities to avoid sensitive environmental resources. These facilities would be less than 1.0 acre in size.

Comment: 15 - The WDEQ-LQD Jackpot Mine permit application, (GMMV 1994:Volume 1, Mine Plan, page 20) states a maximum of 300,000 tons of uranium ore would be stockpiled (100 days supply at a milling rate of 3,000 tons per day) at the fenced Jackpot Mine site. The goal of GMMV is to keep the stockpile to a minimum. However, some stockpilling at the mine would occur to allow continuous mine operation during shipping delays or mill shut down. The BLM has determined through our review that alternate stockpile sizes and locations would have little effect on the impacts presented in this EIS.

Comment: 16 - The Kennecott Uranium Company has provided a report Estimated Potential Radiation Doses to Off-site Individuals from Storage of Uranium Ore at the Jackpot Mine (1995) which evaluates the potential for exposure to radiation. The report indicates that the 30 acres of existing disturbance and 118 acres of new disturbance includes existing disturbances from the License to Explore 197LE, the Big Eagle facilities and pits, roads, easement areas, and the entire fenced Jackpot Mine site. The fenced Jackpot Mine site would be 42 acres, which includes all disturbances from soil, ore, rock piles, ponds, and water treatment facilities, material storage areas, and other mine-required areas.

Comment: 17 - The BLM concurs that the disposal of waste rock into the Big Eagle pit is preferred over surface disposal. GMMV (1994:Volume 1, Mine Plan, Mitigation Section, page 13) specifies that mine waste rock would be hauled to the Big Eagle Mine and placed in one of the existing pits at the mine.

Comment: 20 - Further detail on the sediment dam is provided in the WDEQ-LQD Jackpot Mine permit application (GMMV 1994:Volume 1, Mine Plan and Attachments).

Comment: 21 - The BLM has determined through our consultations and data reviews that the hydrologic data presented in GMMV (1994), which has been deemed technically adequate by WDEQ, are reasonable. These data indicate that mine water discharge rates would not likely exceed 732 gpm.

Comment: 22 - The text has been changed (see modifications to Section 2.1.2.7, in this FEIS).

Comment: 23 - See Section 8.2.3, Comments 1 and 4, in this FEIS.

Comment: 24 - Most references to GMMV (1994) summarize text from that document in sufficient detail for this EIS; however, several new references have been made in this FEIS to provide more explicit references.

Comment: 25 - The design, location, and operation of the water treatment facility are sufficiently discussed in DEIS Volume 2, Chapter 2.1.2.7. The purpose of the treatment facility is to eliminate surface water quality impacts. Further detail is provided in GMMV (1994:Volume 1, Attachment 6, Water Treatment).

Comment: 26 - All barium/radium sulfate precipitate formed in the ponds would be handled, stored, transported, and disposed of such that no impacts to public health and safety or the environment are anticipated.

Comment: 27 - The text has been changed (see modifications to Section 2.1.2.7 in this FEIS).

Comment: 28 - The BLM, using independent analysis and consultation, believes that the triggers as proposed by WDEQ and GMMV are adequate. The triggers were developed in response to the detailed hydrologic analyses presented in GMMV (1994), and the BLM is in concurrence with these analyses.

Comment: 29 - The text has been changed to include the explicit reference (see modifications to Section 2.1.2.7 in this FEIS).

Comment: 30 - Groundwater monitoring at existing wells (PZ-series) on Green Mountain have generally shown seasonal variations of less than 5 feet; however, some wells (all series) have shown considerably greater variability (GMMV 1994:Volume 4, Appendix D-A, pages 3-21 and 3-22). Therefore, the BLM believes the drawdown trigger level of 5 feet is conservative and drawdowns of less than 5 feet will have no effect on surface waters.

Comment: 31 - To assume that any loss or impairment of surficial hydrologic features within 5 miles of the proposed mine during operation is a result of the operations places an undue hardship on the project proponents for which they may not be responsible. Monitoring and triggers are presented in DEIS Section 2.1.3, and mitigative actions to riparian habitat would be developed in consultation with GMMV, WDEQ, and other agencies to protect riparian habitats if any indication that negative changes have occurred or are occurring in riparian areas. The BLM anticipates no surficial hydrologic impacts from groundwater drawdowns.

Comment: 32 - Text changes have been made (see modifications to Section 2.1.2.8 in this FEIS).

Comment: 33 - Text changes have been made (see modifications to Section 2.1.2.10 in this FEIS).

The potentially significant "trigger" for AGP is an ANP-AGP ratio of less than 3:1. If sampling of waste materials indicates an ANP-AGP ratio less than 3:1, mitigation measures, developed in consultation with the BLM and WDEQ, would be applied.

Comment: 34 - The text states: "Pursuant to the 1872 Mining Law, a BLM ROW is not required.

Comment: 35 - The BLM encourages GMMV to use car pools; however, the use of car pools and busing will not be mandated. GMMV may determine that the use of subsidized busing for employees from population centers to the Big Eagle facility may be appropriate; however, this will be dependent on shift schedules, shift manpower levels, and numbers of employees served. GMMV will bus employees from the Big Eagle facilities to the Jackpot Mine site.

Comment: 36 - Further detail is provided in GMMV (1994:Volume 1a, HY 20, Riparian Habitat Enhancement and Monitoring Program).

Comment: 37 - The BLM, in consultation with the WDEQ-LQD, developed a 5-year criteria for the application of interim WDEQ-LQD mine stabilization measures for this project.

Comment: 38 - The sentence has been changed (see modifications to Appendix B in this FEIS).

Comment: 39 - See Comment 36, above.

Comment: 40 - GMMV is committed to the implementation of all mitigation, monitoring, and environmental protection measures specified in this EIS, the Plan of Operations for the project, the WDEQ-LQD Jackpot Mine Permit, and all other associated permits. No waivers of proposed mitigation, monitoring, and/or environmental protection measures are anticipated; however, in the event that a waiver is proposed, appropriate notices identifying the proposed waiver would be posted at the BLM Lander Resource Area and Rawlings District Offices, in compliance with BLM policy. In addition, if IDT analyses show that impacts beyond the levels predicted in this EIS could occur as a result of the waiver, further NEPA analyses would be conducted.

Comment: 41 - The BLM believes it is unnecessary to define the components of the permit requirements necessary for the filing of the BLM Land Use Resource Area and Rawlings District Office comment (see comments on local areal basis, and in the plan) is provided in DEIS Table 1.1. No net loss of wetlands is anticipated as a result of the proposed project.
In considering reasonable alternatives for the Jackpot Mine EIS, the BLM considered a ruling of the Interior Board of Land Appeals (IBLA). In Southwest Resource Council, 96 IBLA 64, 65 (1987), the IBLA stated, "...BLM may require design changes in plant operation or in the route of access. BLM may not, however, absolutely forbid mining or totally forbid access to a valid mining claim (see Utah v. Anderson, 486 F. Supp. 995, 1011, 1979). The reason, of course, is that such a restriction contravenes the congressional policy as expressed in the mining laws, which accord a mining claim rights, even against the government, upon the discovery of a valuable mineral deposit. Thus, while BLM clearly has some discretion in the approval of mining plans of operation, there are parameters which establish the limits of its exercise."

The fact that there are resources of uranium at the Big Eagle and Sweetwater properties owned by GMMV, or at the Crooks Gap-Sheep Mountain properties owned solely by USE/Crested Butte Corp., does not prevent BLM from allowing GMMV to drive the twin declines to the potential ore bodies of the Jackpot Mine to further evaluate the ore grade and extent of the deposits. The BLM has a statutory right to explore for locatable mineral resources provided the explorations do not create unnecessary or undue degradation as defined in the 43 CRF 3809.0-5(d). The same criteria apply to the development mining of deposits and the transportation of the ore to a selected mill.

The BLM believes that all reasonable alternatives, including the No Action Alternative, are fully addressed and addressed adequately in the DEIS. The alternatives as identified, discussed, and rejected, except for the alternative haul routes, fulfilled the 40 CFR 1502.14(a) standard. The alternative essentially addressed what could happen at the existing mines under interim stabilization should BLM take no further action to approve the proposed plan of operations for the Jackpot Mine. The BLM approved 1502.14(a) to address impacts, devise necessary mitigation, and approve the plans of operations as appropriate if plans are submitted for the Big Eagle Mine, the mines in the Crooks Gap-Sheep Mountain area, and/or the Sweetwater Mine.

Comment 49 - The Sweetwater Mine is another uranium mine property owned by the GMMV, a venture between Kennecott and USE/Crested Butte Corp. The Crooks Gap and Sheep Mountain properties have not been changed to address the uranium resources remaining within the mine property.

Comment 50 - This EIS was prepared objectively and without a conflict of interest. The BLM, as the lead agency for EIS preparation provided guidance, input, participation, and independent evaluation of the EIS. In accordance with 40 CFR 1506.5(a) (b), the BLM is in agreement with the findings of the analysis and approves and takes responsibility for the scope and contents of this document. Your comment is noted.

Comment 51 - A copy of the Conflict of Interest statement is available for review at the BLM Rawlins District Office and does not need to be included in the EIS.

Comment 52 - Since the WDEQ will require an air quality permit prior to mine development and numerous mitigation measures will be applied to minimize adverse air quality impacts throughout the life-of-project, the BLM believes that air quality would be adequately protected. No recent ambient air quality monitoring has been conducted by the WDEQ. The BLM has reviewed the WDEQ's air quality monitoring program and found that the data were adequate. The BLM is of the opinion, based on the information presented above and in the DEIS, that the WDEQ's air quality standards are consistent with the BLM's air quality standards.

Comment 53 - The Geological Survey of Wyoming was consulted during the preparation of the EIS and was provided a copy of the DEIS. The BLM concluded that the Geological Survey of Wyoming, not the USGS, maintains the best most up-to-date record of potential geologic hazards in the project area.

Comment 54 - Consultation with the Wyoming Geological Survey concluded that so known abandoned underground mines were present in the proposed mine area.
The significance criterion has been changed (see modifications to Section 4.1.7.1 in this FEIS).

Comment: 63 - The significance criterion was adopted from BLM (1994), and given the paucity of extant data regarding noise levels on wildlife and recreation, the significance criterion is a prudent measure for determining impact significance. A 55 dBA noise approximately corresponds to noise levels associated with normal conversation (BLM 1995).

Comment: 65 - The significance criterion was adopted from BLM (1990b).

Comment: 66 - The BLM has a firm understanding of the value of wetlands and is committed to wetland protection. The proposed mitigation to establish a riparian habitat enhancement program covering 20 acres, along with associated monitoring should provide some indication of this understanding and commitment. No net loss of wetlands is anticipated from the proposed project.

Comment: 67 - The BLM has determined that impacts as described in the EIS are adequate. In addition, since none of the significance criteria would be exceeded, the BLM concludes that viable wildlife populations would be maintained. See also Section 8.2.3, Comment 6, in this FEIS.

Comment: 68 - Comment noted.

Comment: 69 - Kenneecott has provided an analysis of radiological risks from airborne particles (Kenneecott 1995) that addresses questions concerning emissions from ore stockpiles (see Comment 16, above). Emissions from ore transport would be covered under Department of Transportation (DOT) regulations, and worker health and safety would be insured by adherence to Mine Safety and Health Administration (MSHA) regulations. Radiological risks associated with mill operations would be minimized by adherence to Nuclear Regulatory Commission (NRC) (10 CFR 20) and EPA (40 CFR 61 and 190) regulations.

Decline and vent emission risks would be covered under EPA regulations (40 CFR 61). Radon emissions at the portals and vents would be monitored continuously. The nearest off-site monitoring location would be 9.2 miles northwest of the mine site. EPA regulations specify that radon emissions shall not exceed amounts causing any member of the public to receive an effective dose equivalent of 10 rem per year. Surface water impacts would be monitored and minimized with adherence to National Pollutant Discharge Elimination System (NPDES) permit requirements. Ore stockpiles having potential radiological impacts would be designed such that leachates and other runoff waters are directed to impoundments for monitoring and treatment as necessary. Mine waste rock radiological impacts to water resources are expected to be negligible, and would be monitored throughout the LOP. In addition, GMMV would adhere to all regulatory requirements for radiological emissions specified by all authorizing agencies.

Comment: 70 - Since the air quality permit required by WDEQ-AQD would mandate the use of best available control technologies, and this permit would be in place prior to the start of mine operations, the BLM analysis indicates that air quality impacts from the mine would be minimized to insignificant levels.

Comment: 71 - Since mine waste rock would be disposed of at the existing Big Eagle pit, further detail on this feature is unnecessary. The other features referenced are adequately described in the EIS. Additional information is available in the WDEQ-LQD Jackpot Mine permit application (GMMV 1994-Vol. 1. Mine Plan and Attachments), which is available for public review at the BLM Lander Resource Area and Rawlins District Offices. As these features are developed, further detail will become available as submittals to the WDEQ-LQD.

Comment: 72 - The text has been changed (see modifications to Section 4.6.2 in this FEIS).

Comment: 73 - Further information on reclamation bonding for the Jackpot Mine and the review processes required to determine bond amounts has been included (see modifications to Appendix B in this FEIS).

Comment: 74 - The existing Environmental Assessments and Environmental Reports for the Sweetwater Mill (NRC 1985, 1992; Kenneecott 1994) were reviewed for the preparation of the EIS. Pertinent information within these documents was utilized for cumulative impact assessments (e.g., size and location of disturbances). Please refer to DEIS Section 1.3.

Comment: 75 - The BLM believes the Plan of Operation for the Jackpot Mine is adequately summarized in Chapter 2.0 of the DEIS. The plan is also available for public review at the BLM Lander Resource Area and Rawlins District Offices. The most complete description of GMMV's proposed operations is provided in the WDEQ-LQD Jackpot Mine permit application, which is also available for review at the BLM offices.

Comment: 76 - During the many years of study regarding the potential hydrologic impacts from this project some lack of confidence still exists. While all uncertainty still exists, the BLM has determined that hydrologic descriptions and project impacts are adequately addressed in the EIS based on multiple BLM, WDEQ, and consultant analyses. The BLM and WDEQ are in concurrence since the Jackpot Mine permit application has been deemed technically adequate by the WDEQ and the data contained in the EIS are a summary of those presented in the application (GMMV 1994). During the initial WDEQ evaluation of the Jackpot Mine permit application package, concerns were raised about the hydrologic interconnection between the surface and groundwater levels. Further hydrologic evaluations coupled with applicant-committed surface mitigation, monitoring, and enhancement measures as presented in Sections 2.1.2.7, 2.1.2.8, 2.1.3, and 2.1.6 address WDEQ concerns. The BLM believes that potential hydrologic impacts are adequately described in the EIS.

Comment: 77 - The BLM has considered existing impacts from these mines in this EIS (see DEIS, Section 4.0). Future activities at these mines were not assessed since it is unknown when these mines will resume activities and what these activities may entail. NEPA analyses would be conducted when these mines resume operations if a federal action is involved.

Comment: 78 - The BLM believes that regional cumulative effects have been addressed at an appropriate level for this EIS. The majority of the projects mentioned are a considerable distance from the 8 mile cumulative impact area analyzed for this project.

Comment: 79 - The BLM has determined that the reclamation of lands required for the project would be adequate, since reclamation efforts at the site would be continued until the area is appropriately stabilized and revegetated, per BLM and WDEQ requirements. Furthermore, the bonds held by WDEQ and the BLM will ensure that adequate funds are available to complete reclamation in the event that GMMV fails to meet reclamation criteria.
Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

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Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments. Your comments have been noted (see Section 8.2.14, Comments 47, 48, and 49, in this FEIS).
Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments. Your comments have been noted.

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Thank

Please refer

LARRY DOUGI January 11, 1984 Page 4

The project is not working. We should consider cutting off all federal, state and local official cooperation to achieve the differences.

You may think that because of the recent federal budget cuts, this budget is in the black. We have a problem, but it is not clear that our project will ever be able to achieve its goals.

If we agree to be part of this project, please make sure that you have the resources to complete it.

Sincerely,

LARRY DOUGI


do

Attachment:

John Nicholson
Department of Environmental Quality
Fremont

8.2.27 Randy D. and Connie Nussbaum

February 15, 1984

To Larry Doug:

We are very concerned about the proposal to construct a new sewage treatment plant in the San Francisco Bay area. We have been in constant contact with various local, state and federal agencies regarding the project, and we believe that the project is not feasible.

The proposed project is not economically sound and it is not in the best interest of the San Francisco Bay area. We believe that the project is not feasible and that it should be discontinued.

Sincerely,

Randy D. and Connie Nussbaum

8.2.28 Ellen Holmann

August 15, 1985

To: Larry

I am writing to express my concern about the proposed project to construct a new sewage treatment plant in the San Francisco Bay area. This project is not feasible and it should be discontinued.

I believe that the project is not economically sound and it is not in the best interest of the San Francisco Bay area. We should work together to ensure that the project is discontinued.

Sincerely,

Ellen Holmann
Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

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8.2.20 Lewis B. Diehl

8.2.29 S.T. Wesaw

8.2.30 S.T. Wesaw

8.2.31 T Cross Ranch

Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments. Please refer to Section 8.2.14, Comments 47, 48, and 49, in this FEIS.
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Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

Comment: 1 - Please refer to Section 8.2.14, Comments 47, 48, and 49, in this FEIS.

Comment: 2 - The BLM concurs that waste rock materials should be disposed of in a pit at the Big Eagle Mine. Please refer to Section 8.2.14, Comments 15 and 19, in this FEIS.

Comment: 3 - The BLM concurs that stringent mitigation and monitoring measures should be followed throughout the implementation of this project.

8.2.32 Barbara Parsons

Survey of Land Management

Subject: Proposed Jack Pot Mine

I'm deeply concerned about another uranium mine in being proposed in the area where radioactive waste mining has already taken place. The BLM has determined that the area is contaminated and should be avoided. I believe that a new mine in such a sensitive area would be a major threat to our environment and public health.

8.2.33 Sarah Kraft

We should conduct an environmental impact analysis before proceeding with any new mining activity. This will help ensure that the project is safe and responsible.

Sincerely,
Barbara Parsons

8.2.34 Richard S. Paulafuru, Sr.

I would like to express my concerns about the proposed Jack Pot Mine. I understand that uranium mining can have serious environmental impacts. I believe that the BLM should proceed with caution in this matter.

Sincerely,
Richard S. Paulafuru, Sr.
Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments. Your comments have been noted.

Comment: 1 - Please refer to Section 8.2.14, Comments 47, 48, and 49, in this FEIS.

Comment: 2 - Please refer to Section 8.2.14, Comments 15 and 19, in this FEIS. Stringent mitigation and monitoring measures would be applied throughout the LOP.

Comment: 3 - Please refer to Section 8.2.14, Comments 35 and 52, and Section 8.2.24, Comment 4, in this FEIS.

Comment: 4 - Please refer to Section 8.2.3, Comment 1, and Section 8.2.24, Comment 2, in this FEIS.
Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments. The concerns of the Wyoming Game and Fish Department are addressed in the comments accompanying that letter.

Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments. No unreasonable restrictions would be placed on the provision of utility service or the construction of utility and pipeline facilities.

Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

Comment: Entire Letter - You are correct in assuming that health and safety concerns to mine workers, including those from radon emissions, would be covered by compliance with MSHA regulations, as well as those of the Wyoming Mine Inspector.
Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments. The BLM will manage cultural resources in accordance with Section 106 of the Natural Historic Preservation Act and Advisory Council on Historic Preservation regulations (36 CFR 800).

8.2.21 Wyoming Game and Fish Department

Wyoming Game and Fish Department

203 West 13th Street, Cheyenne, WY 82002

February 20, 1995

Mr. Julie Hamilton

Wyoming Department of Commerce

Department of Commerce

Cheyenne, WY 82002

Dear Mr. Hamilton,

I appreciate the Wyoming Game and Fish Department having provided the appropriate environmental impact statement for the proposed alternative on the National Environmental Policy Act. The analysis of the BLM and the Wyoming Game and Fish Department is well done.

I would like to bring to your attention the following:

1. In the absence of a determination of which alternative has been selected, the analysis of the BLM could be skewed.

2. The discussion of the impact of Alternative A on wildlife is based on the assumption that the sage grouse habitat is the only impacted wildlife species. However, the analysis does not consider the potential impact on other wildlife species in the proposed area.

3. The analysis of the BLM does not consider the potential impact of the proposed project on the endangered species, specifically the sage grouse.

Please consider these points as you review the document.

Sincerely,

[Signature]

Mr. John Hamilton

Wyoming Game and Fish Department

Mr. John Hamilton

Wyoming Game and Fish Department

July 28, 1995

360 11th Street

Cheyenne, WY 82002

Dear Mr. Hamilton,

I appreciate the opportunity to discuss the potential impact of the proposed project on wildlife species, specifically the sage grouse. The analysis of the BLM does not consider the potential impact on other wildlife species in the proposed area.

Please consider these points as you review the document.

Sincerely,

[Signature]

Mr. John Hamilton

Wyoming Game and Fish Department
This review is in addition to notification of animal mortalities.

The employee education, no road fencing, and wildlife enhancement is discussed in the DEIS, Section 5.2.10 and 8.2.14, Comment 35 in this FEIS.

The BLM suggests that the project area is committed to additional measures to reduce potential disturbances to animals. As stated, these measures are committed mitigations (see modifications to Section 2.1.6, in this FEIS).

The additional discharge into Fourth Creek could potentially provide fishery benefits in the future, as long as the Fish Enhancement Specialist in the Final EA is in agreement.

The employee education and monitoring of these species is discussed in the DEIS, Section 5.2.10 and 8.2.14, Comment 35 in this FEIS.

Executive Order 11990 mandates no net loss of wetlands. To ensure no net loss of wetlands, enhancement measures to restore or create new wetland/riparian areas would be developed with the BLM, WDEQ, WGFD, USFWS, and other relevant agencies and/or individuals. Riparian habitat monitoring and enhancement is discussed in DEIS, Section 2.1.3.

It is unknown whether pumping would occur during potential interim mine stabilization. This would be addressed in potential interim mine stabilization plans. If interim mine stabilization measures are in force and groundwater pumping activities are maintained, monitoring and mitigation measures would be applied as specified in the EIS.

Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

Comment: 1 - As stated in the DEIS, Section 2.1.2.3, at full production, additional drifts for air intake and exhaust may be developed. The exact location of the additional ventilation facilties would be determined upon completion of the final mine and ventilation plans, the details of which are dependant on data collected during the proposed underground exploration program. If additional ventilation facilities are proposed for construction in the future, their impacts would be assessed and mitigation, if appropriate, would be developed. Drifts would be located to the maximum extent possible, away from sensitive resource areas, and further NEPA analysis may be warranted. The State of Wyoming would be consulted regarding the location of these drifts and necessary mitigations would be applied. See also Section 8.2.14, Comment 14, in this FEIS.

Comment: 2 - Your comment is noted; the BLM concurs.

Comment: 3 - The BLM agrees that a potential hazard exists and will require wildlife deterrents to be used on sediment and settling (retention) ponds. Please refer to Section 8.2.3 Comment 1 in this FEIS

Comment: 4 - See Comment 3, above.

Comment: 5 - GMMV would provide transportation in the form of buses or other vehicles from the Big Eagle facility to the Jackpot Mine site. BLM cannot mandate car pooling or busing from various towns to the mine site; however, the BLM encourages voluntary implementation of a car or van pool program to reduce potential vehicle noise disturbances and possible wildlife/vehicle collisions (see DEIS, Section 2.1.6-2.4). The BLM must commit to working with the employees to develop strategies that will effectively reduce potential disturbance to wildlife and vehicle noise emissions.

Comment: 6 - It is existing GMMV policy to prohibit firearm possession on company-controlled property.

Comment: 7 - The BLM realizes that the big game population data presented in the DEIS are not the most current information. This is the result of the time frame over which the EIS was prepared. However, the BLM has reviewed these data and concluded that the use of more recent data would not result in substantive changes in the impact assessments for these species.

Comment: 8 - See Comment 17, above.

Comment: 19 - See Comment 9, above.

Comment: 20 - Text changes have been made (see modifications to Section 3.2.4, Table 3.13, in this FEIS).

Comment: 21 - The wildlife significance criteria as presented in the DEIS are used to gauge the severity of impacts and are set conservatively. Mitigations are designed to minimize all identified impacts, not only those identified as significant. Please refer to Section 8.2.3, Comment 6 and Section 8.2.14, Comment 67, in this FEIS.
Comment: 22 - The BLM has concluded that since restrictions on noise-producing activities proximal to leks during the sage grouse breeding season would be applied for this project, existing impacts to sage grouse breeding would not be augmented by this project (see DEIS, Section 2.1.6, item 19).

Comment: 23 - The BLM concurs with 40 CFR 1508.7; however, the BLM also concluded there would be no adverse cumulative effects to T&E species and only negligible cumulative impacts to candidates and other species of concern.

Comment: 24 - Text changes have been made (see modifications to Section 5.3.7, in this FEIS).

Comment: 25 - Text changes have been made (see modifications to Appendix B, Section 4.1, in this FEIS); however, concrete still may be buried on-site.

Comment: 26 - Text changes have been made (see modifications to Appendix B, Table B-1, in this FEIS).

Comment: 27 - Reclamation would begin within 180 days of mine closure (Appendix B, Section 6.0) and be completed within three years of the cessation of mining (DEIS, Section 2.1.4, Table 2.5). The reclamation bond would not be released until WDEQ-LQD and BLM are satisfied that reclamation goals and objectives have been met (Appendix B, Section 6.0).

Comment: 28 - While the BLM does not believe it is necessary to install control structures until there is some evidence that discharges would reach 732 gpm, further investigations of the Fourth Creek drainage would be conducted prior to water discharge in this drainage, and some areas may be stabilized based on these investigations.

Comment: 29 - A discharge of 732 gpm was chosen based on existing hydrologic data presented in GMMV (1994) and in consultation with BLM, WDEQ, and GMMV (see Section 8.2.14, Comment 28, in this FEIS).

Comment: 30 - The 5-foot drawdown of groundwater that would trigger mitigation measures was selected based on existing hydrologic data presented in GMMV (1994) and in consultation with BLM, WDEQ, and GMMV (see Section 8.2.14, Comment 30, in this FEIS).

Comment: 31 - Please see DEIS, Section 2.1.3. Further information on possible riparian enhancement measures is provided in GMMV (1994: Volume 1a, Section HY 17). Please refer to Section 8.2.14, Comment 56, in this FEIS.

Comment: 32 - Fisheries are adequately addressed in the DEIS. Seventy-five percent of the maximum number of 250 workers would come from the existing pool of unemployed or underemployed workers in the area, so there would be no significant population increase, and increased impacts to fisheries and other recreational resources are also expected to be insignificant (see DEIS, Section 4.5.2).

Comment: 33 - Stream fishery resources are described in DEIS Section 3.2.2.4, and impacts, which are expected to be negligible, are described in DEIS Sections 4.2.3.4 and 4.5.2. While groundwater drawdowns affecting surface water resources are not anticipated, groundwater, as well as surface water monitoring, would occur throughout the LOP to ensure that if mine-induced impacts are noted, appropriate mitigations would be applied.

Comment: 34 - Mitigation measures are adequately described in the DEIS; however, additional mitigation detail from the WDEQ-LQD mine permit application is included in this FEIS as Appendix C.

Comment: 35 - The BLM and GMMV would consult with the WGFD regarding fisheries mitigation issues during the development of riparian enhancement measures.

Comment: 37 - If energy-dissipating structures are utilized at water discharge points, the BLM would consult with WGFD personnel prior to their installation.

8.2.44 Jennifer and Neil Miller

4605 - 4607

Bull Valley Road

P.O. Box 742

Rawlins, WY 82301

Dear Mr. Knetch:

We are very concerned about the environmental integrity of the state of Wyoming, the purity of its ground and surface water, the reclamation of its land, the cleanliness of its air, the stability of its wetlands, and the health of its wildlife. We do not want our mountains unnecessarily disturbed.

Therefore, please reconsider the Big Eagle/Sweetwater Mine alternative. It is not sensible to allow Kennecott to open another area for mining of uranium in the Green Mountains when they have mines already with proven reserves. The possible impacts of this mine on the underground water system of the Green Mountains is enough to halt the project altogether. The aquifer is a precious resource that should not be tampered with.

Do not allow the desktop mine proposal to go through. This is public land and the proposal is not in the best interest of the public.

Sincerely,

Jennifer Miller

Neil Miller

8.2.45 Wyoming State Legislature, Ely D. Bebout

Wyoming State Legislature, Ely D. Bebout

8-52

Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments. Please refer to Section 8.2.14, Comments 47, 48, and 49, in this FEIS.

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8.2.53 Wyoming Heritage Society

Wyoming Heritage Society

[Letter]

August 19, 1989

Lisa Manager
Wyoming Heritage Society

Dear Lisa,

Thank you for taking the time to review the DEIS and providing your comments.

Sincerely,

[Signature]

Lisa Manager

8.2.54 The City of Lander Office of Economic Development Commission

The City of Lander Office of Economic Development Commission

[Letter]

August 18, 1999

Anne Manager
Lander Business Area

Dear Anne Manager,

Thank you for taking the time to review the DEIS and providing your comments.

Sincerely,

[Signature]

Anne Manager
Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

Comment: 1 - Use of the Big Eagle facilities is a component of the proposed project. Under the BLM preferred alternative for the proposed project, reclamation of pits at the Big Eagle Mine would be facilitated by placing mine waste rock from the Jackpot Mine at a Big Eagle pit. Please refer to Section 8.2.4, Comments 47, 48, and 49, in this FEIS.

Comment: 2 - Your comment is noted (please see DEIS, Sections 2.1.2.7, 2.1.2.8, and 2.1.3).

Comment: 3 - The BLM preferred alternative calls for the disposal of waste rock material in an existing pit at the Big Eagle Mine. GMMW would monitor settling and detention ponds as identified in DEIS, Section 2.1.2.7. Please refer to Section 8.2.3, Comment 1 and Section 8.2.4, Comments 47, 48, and 49, in this FEIS.

Comment: 4 - Your comments are noted. Please refer to Section 8.2.4, Comments 47, 48, and 49, in this FEIS.

Comment: 5 - Your comments are noted. Please refer to Section 8.2.14, Comments 47, 48, and 49, in this FEIS.

Comment: Entire Letter - Thank you for taking the time to review the DEIS and providing your comments.

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