Environmental Assessment for Stillwater Mining Company’s Benbow Exploration Portal and Support Facilities Plan of Operations for Mineral Exploration

Beartooth Ranger District
Custer Gallatin National Forest
Stillwater County, Montana

May 2015
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Environmental Assessment for
Stillwater Mining Company’s Benbow Exploration Portal and Support Facilities Plan of Operations for Mineral Exploration
Stillwater County, Montana

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Summary: The U.S. Forest Service (USFS) and Montana Department of Environmental Quality (MDEQ) propose to approve a Plan of Operations for a mineral exploration proposal in Stillwater County, Montana. Stillwater Mining Company (SMC) has proposed constructing the Benbow exploration portal connected to an underground decline and related surface support facilities on National Forest System lands approximately four miles southwest of Dean, Montana. Proposed surface infrastructure includes a portal pad, an access road, waste rock management facilities, water wells, a water treatment plant, and a water disposal system. Excess water generated from mineral exploration would be collected and treated to remove nitrogen to State water quality standards. After treatment, Stillwater Mining Company’s proposal includes two potential water disposal options: 1) Injection well disposal or 2) Land Application Disposal (LAD) system. Injection well disposal would consist of injecting treated water into the Environmental Protection Agency approved receiving groundwater aquifer. LAD would consist of storing treated water in a pond and using pivot sprinklers to evaporate and apply treated water across meadows in the Benbow area during summer. Effects of using the LAD system are analyzed and disclosed under the Proposed Action. Effects of using the injection well disposal option and using waste rock to surface roads, improve a parking area and cap historic chrome mine tailings are analyzed and disclosed under the Agency Mitigated Alternative. A No action alternative is also analyzed and effects are portrayed for comparative purposes.

The purpose for State and Federal action is the June 18, 2014 submission of SMC’s Benbow Exploration Portal and Support Facilities Plan of Operations for Mineral Exploration (referred to hereafter as Plan of Operations). The need for State action is MDEQ’s responsibility to issue exploration licenses and approve amendments under the Montana Metal Mine Reclamation Act. The need for Federal action is the Forest Service’s responsibility to approve or require modifications to the Plan of Operations in accordance with Federal mining and environmental law.

Based upon the purpose and need for action and the direct, indirect and cumulative effects of the alternatives, the Forest Supervisor and Environmental Management Bureau Chief will decide whether and under what conditions to approve the Plan of Operations.
**Comment Process:** In compliance with 36 CFR 218 Subparts A and B, this Environmental Assessment was made available for public review and comment for 30 days from the March 23, 2015 publication date of a legal notice published in the Billings Gazette. The 30-day comment period has concluded and comments are no longer being solicited or accepted.

**Objection Process:** This proposed project is an activity implementing a land management plan and not authorized under the Healthy Forests Restoration Act (HFRA), that is subject to 36 CFR 281 subparts A and B. The Forest Service and Montana Department of Environmental Quality are publishing this Environmental Assessment and a Draft Decision Notice and Finding of No Significant Impact as required by the 36 CFR 218. The Draft Decision Notice and Finding of No Significant Impact include Appendix A, which is a response to comments on the March 2015 Environmental Assessment. The Draft Decision Notice and Finding of No Significant Impact include information on eligibility to file an objection and how to file an objection.
Errata


Introduction
Additional information regarding the completed 30 day comment period and objection process were added.
Errata information added.

Chapter 1
Section 1.7: Heads re-numbered.

Chapter 2
Section 2.7: Management area descriptions revised to account for proposed beneficial waste rock locations.
Table 2.10: Clarification made for Forest Plan compliance for Proposed Action Alternative effects to scenery resources.

Chapter 3
Scenery Resources:
- Subsection 3.12.5: Added information for 36 CFR228, Subpart A and re-numbered subsequent Scenery Resources subsections.
- Subsection 3.12.5.22: Revised discussion in Forest Plan Management Area direction to clarify VQO intent.
- Subsections 3.12.6.2.1, 3.12.6.2.3.1, 3.12.6.2.4, 3.12.6.3.3.1 and 3.12.6.3.4: Revised Forest Plan Management Area direction discussion to clarify the Proposed Action Alternative 2 would not comply with Management Area B VQO nor meet the intent of 36 CRR228 d.
- Subsection 3.12.6.3: Added paragraph to provide additional description of Agency Mitigated Alternative.
- Subsection 3.12.6.3.4: Added statement regarding compliance with 36 CFR 228a scenery resource requirements.

Wildlife: Introductory information added to Section 3.4.1 regarding the recently completed Biological Evaluation and Biological Assessment.

Chapter 4
No changes made to Chapter 4.
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1 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

The U.S. Forest Service (USFS) and Montana Department of Environmental Quality (MDEQ) propose to approve a Plan of Operations for mineral exploration in Stillwater County, Montana. Stillwater Mining Company (SMC) has proposed to construct the Benbow exploration portal connected to an underground decline and related surface support facilities on National Forest System lands approximately four miles southwest of Dean, Montana (see map on front cover of document).

Council on Environmental Quality (CEQ) regulations provide that:

An environmental assessment (EA) shall be prepared for proposals as described in § 220.4(a) that are not categorically excluded from documentation (§ 220.6) and for which the need of an EIS has not been determined (§220.5). (36 CFR 220.7(a)).

The USFS and MDEQ have prepared this Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA), Montana Environmental Policy Act (MEPA) and other relevant Federal and State laws and regulations. The purpose of this EA is to:

1. Briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.
2. Aid an agencies’ compliance with NEPA and MEPA when no environmental impact statement (EIS) is necessary.
3. Facilitate preparation of a statement when one is necessary (40 CFR 1508.9(a)).

This EA describes the direct, indirect and cumulative environmental impacts of the proposed action, an agency mitigated alternative and no action, and discloses these impacts to the public and the decision maker. An EA displays analysis that speaks to the context and intensity of environment effects of the proposed action and all alternatives.

The document is organized as follows: Chapter 1 describes the purpose and need for action and public participation / scoping efforts. Chapter 2 describes two action alternatives and a no action alternative, as well as alternatives that were considered but not examined in detail. This chapter also lists Design Criteria and describes any monitoring that will occur. Chapter 3 describes the existing condition and potential environmental effects of implementing the alternatives. This chapter is organized by resource area. Chapter 4 lists personnel that conducted the analyses and coordination efforts to date.

1.2 PROJECT AREA

The Benbow Exploration Portal Plan of Operations project area is on the Beartooth District of the Custer Gallatin National Forest and is located approximately 4 miles southwest of Dean, Montana in Stillwater County. It is geographically located within the Little Rocky Creek drainage, a tributary to the Stillwater River. Specifically, the project is proposed in Township 5 South, Range 16 East Stillwater County, Montana. See map on front cover.

The project area lies immediately north of an area referred to by geologists as the Stillwater
The Stillwater Complex is a large mineral deposit containing iron, copper, nickel, chromium, gold, silver, and platinum group elements. Immediately north of, and adjacent to, the Stillwater Complex resides an upturned sedimentary rock package composed of alternating shales, limestones, sandstones, and dolomites. During the Beartooth Uplift, when the Beartooth Mountains were formed, the deeper older rock of the Stillwater Complex was thrust up against the younger sedimentary rock. The once-horizontal sedimentary rock layers were faulted and folded during the Beartooth Uplift to a near-vertical orientation that parallels the Beartooth Mountains (Geraghty 2013).

There have been numerous mineral development projects in the Stillwater Complex since the late 1800’s, including mining and exploratory mapping and drilling in the Little Rocky Creek drainage (Czamanske and Zientek 1985). Portions of the Little Rocky Creek drainage are referred to as the Benbow area, named after T.C. Benbow, who led chromite mining efforts in the early 1900’s. During World War II, mining in the Benbow area resulted in development of a mine, mining camp, and a concentration plant referred to as the Benbow chromite mill site. Since that time, several companies have conducted surface geologic mapping, soil sampling, geophysical data collection, and drilling in this portion of the Stillwater Complex. Today, SMC mines platinum group metals at the nearby Nye mine, a few miles west of the Benbow area. SMC also has numerous unpatented mining claims in the Benbow area.

SMC’s Benbow Portal Plan of Operations proposes an exploratory portal and surface support facilities in the sedimentary rock portion of the Beartooth Mountains (Figure 1.1). This portal would connect to an underground decline connected to underground mine workings that come from the Nye mine in Stillwater Complex geology.
Figure 1.1. Stillwater Mining Company’s geologic cross-section of proposed Benbow decline. Geology after Geraghty 2013.
1.3 PURPOSE AND NEED

While the scope of this environmental assessment (EA) is limited to the impacts of installing an exploration decline, installation of related surface support facilities, and the subsequent reclamation of that decline, the purpose of the decline is to determine the potential for future mining in the Benbow area. As stated in SMC’s Plan of Operations, “The purpose of this exploration portal is to evaluate mineralized resources at the far eastern extent of the J-M Reef within Stillwater’s Claim Package. Assuming economical mineralized resources are present, the long-term use of the Benbow Portal would be to provide underground ventilation support, secondary escape-way for underground personnel, and limited mine resupply.”

The purpose for State and Federal action is the June 18, 2014 submission of SMC’s Benbow Exploration Portal and Support Facilities Plan of Operations for Mineral Exploration (referred to hereafter as Plan of Operations). The need for State action is MDEQ’s responsibility to issue exploration licenses and approve amendments under the Montana Metal Mine Reclamation Act. The need for Federal action is the Forest Service’s responsibility to approve or require modifications to the Plan of Operations in accordance with Federal mining and environmental law.

Stillwater Mining Company has proposed to use National Forest System lands in connection with operations authorized by the United States Mining laws (30 USC 21-54) which confer a statutory right to enter public lands to search for minerals. In accordance with the Code of Federal Regulations (CFR) at Title 36, Part 228a, the Forest Service is required to analyze the Plan of Operations in determining the reasonableness of requirements for surface resource protection.

MDEQ oversees mining within the State of Montana. MDEQ’s responsibilities originate from several acts and their implementing regulations including the Administrative Rules of Montana (ARM) 17.24.102. MDEQ is responsible for issuing exploration licenses and approving amendments under the Montana Metal Mine Reclamation Act (MMRA). The exploration license application must contain an exploration plan of operations stating the type of exploration techniques that would be used in disturbing the land. It also must include a reclamation plan in sufficient detail to allow MDEQ to determine compliance with MMRA reclamation and performance requirements.

MDEQ is also responsible for protecting air quality under the Clean Air Act of Montana, and water quality and quantity under the Montana Water Quality Act. The options that MDEQ has for decision-making upon completion of the EA are (1) denying the application if the proposed operation would violate MMRA, the Clean Air Act, or the Water Quality Act; (2) approving SMC’s application as submitted; (3) approving the application with agency mitigations; or (4) determining the need for further environmental analysis to disclose and analyze potentially significant environmental impacts via preparation of an Environmental Impact Statement (EIS).

1.4 PUBLIC INVOLVEMENT AND SCOPING

36 CFR 220.4 requires scoping on all proposed actions. Scoping consisted of both internal and external efforts to identify important issues, concerns, and analysis needs related to the Benbow Exploration Portal Plan of Operations. Among other things, the scoping process is used to invite public participation, to help identify public issues, and to obtain public comment during the EA process.
SMC held a public meeting on July 19, 2011 in Nye Montana pertaining to their initial concept for a Proposed Action. Additionally, SMC has collaborated with the Stillwater Protective Association during development of their proposal.

The USFS and MDEQ utilized direct mailings, press releases, and a September 15, 2014 public meeting to solicit public scoping comment from September 5, 2014 to October 8, 2014. Approximately 35 individuals attended the September 15, 2014 public meeting in Nye, Montana, including members of the public, representatives of local/regional conservation groups, Stillwater Mining Company employees, and County, State and Federal government representatives.

On September 8, 2014, the USFS mailed and e-mailed a scoping letter to 204 potentially interested individuals and groups, which included adjacent landowners, Forest Service livestock grazing permit holders, and individuals that previously expressed interest in minerals projects on the Beartooth Ranger District. Additionally, the Forest Service issued a press release about the project on September 8, 2014, published the project in the Forest’s Schedule of Proposed Actions, and posted the scoping letter and Plan of Operations on the Custer National Forest website. Public comments were accepted by the USFS through October 8, 2014. Eleven responses containing specific written comments were received (see project record). Additional requests for information and comments concerning matters not specific to this proposal were also received (see project record).

Responses received were analyzed to identify specific written content. Per 36 CFR 218, “specific written comments should be within the scope of the proposed action, have a direct relationship to the proposed action, and must include supporting reasons for the responsible official to consider.” The USFS completed content analysis on scoping comments and identified issues of concern that are considered in this environmental assessment (see project record). Issue statements were also used to identify needs for additional mitigation measures and formulate alternatives to SMC’s proposed action.

1.5 ISSUES

The Interdisciplinary (ID) Team reviewed and compiled a list of potential issues based upon internal review and discussion, and from comments received from the public, organizations, and government agencies. Issue identification was conducted per 40 CFR 1500.1(b) which states “….NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail.” These issues were then evaluated against the following criteria to determine the appropriate method for resolution:

- Is the issue relevant to and within the scope of the Purpose and Need, the decisions being made, and does it pertain directly to the Proposed Action?
- Is the issue already decided by law, regulation, or existing plans? Is it supported by scientific or factual evidence?
- Could the issue be resolved through design and location of activities in the Proposed Action, avoiding the impact by not taking action, minimizing the impact by limiting the action, rectifying the impact by rehabilitation, reducing the impact by maintenance, or compensating for the impact by replacement?
- Issues representing an unresolved conflict with the Proposed Action may be considered a
“key issue” to help formulate the alternatives to the Proposed Action. Information in the project record provides a detailed description of the issues identified during the scoping process and describes how those issues were accounted for during the analysis process. Some issues were utilized to identify changes/modifications/special mitigations that were included in the alternatives. Other issues were included in the analysis to analyze and disclose the effects of the alternatives. Issues analyzed in this document are as follows:

1. Economic effects of exploration proposal.
2. Effects to dispersed recreation use (hunting, trapping, camping, fishing, etc.).
3. Effects to wildlife species and habitats (including Federally listed threatened or endangered species or designated critical habitat, species proposed for Federal listing or proposed critical habitat, or Forest Service sensitive species).
4. Effects to plant species (USFS sensitive plant species, species proposed for Federal listing, noxious weeds, plant communities).
5. Effects to current grazing practices.
6. Effects to aesthetics (noise, visual resources).
7. Effects to water quality and quantity.
8. Effects to aquatic species and habitats (including Forest Service sensitive species).
10. Effects to cultural resources.

1.6 DECISION TO BE MADE

The Responsible Officials for this project are the Forest Supervisor, Custer Gallatin National Forest and Montana Department of Environmental Quality, Environmental Management Bureau Chief. After the close of the EA review and comment period, the Forest Service and Montana Department of Environmental Quality will consider comments submitted by the public, interested organizations and government agencies and respond to these comments. A draft decision will be made available to the public and the project will proceed through the 36 CFR 218 objection process. Based upon the purpose and need for action and the direct, indirect and cumulative effects of the alternatives, the Forest Supervisor and Environmental Management Bureau Chief will decide whether or not to approve the Plan of Operations, and if so, under what conditions.

1.7 APPLICABLE LAWS, REGULATIONS AND POLICIES

There are numerous Federal and State laws, regulations and policies that apply to mineral exploration projects on Forest Service land in Montana. Specific requirements are discussed in this section. Specific requirements are also discussed and alternatives are evaluated for compliance with these requirements in Chapter 3 of this document.

The MDEQ and USFS are the lead agencies for this EA. A December 11, 1989 Memorandum of Understanding between the State of Montana and the USFS provides for preparation of joint environmental analyses and sharing of information, personnel, and funds. As required by 36 CFR 228a and Rules and Regulations Governing the Montana Hard Rock Mining Reclamation
Act, MDEQ and the USFS are also responsible for establishing reclamation bonds. Reclamation bonds are set by the agencies and are held jointly. The USFS may require additional bond if it decides the joint bond is insufficient. The bond is jointly determined by computing costs to the MDEQ and USFS for reclaiming a site should the operator default. The joint bond can be used by either agency per their regulations.

1.7.1 General Mining Act of 1872
The General Mining Act of 1872, as amended was enacted by Congress to stimulate exploration for and development of minerals on federal lands. The Act accomplishes these objectives by giving claim holders statutory rights to develop mineral resources. Claims for viable ore bodies can be patented, and ownership of the ore body can pass into private hands. The Act contains provisions for mining claims and for mill site claims to allow surface occupancy for ore body development. This Act sets forth the principles of discovery, right of possession, assessment work, and patent for hardrock minerals on lands reserved from the public domain. Except as otherwise provided, all valuable mineral deposits, and the lands in which they are found, are free and open to exploration, occupation, and purchase under regulations prescribed by law.

1.7.2 Organic Administration Act of 1897
In 1891, Congress granted the President the authority to establish forest reserves (national forests) from the existing public domain lands. In the Organic Administration Act of 1897, Congress outlined the purposes for the establishment of national forests and provided for their protection and management. These purposes were to improve and protect the forest within the reserves, to secure favorable water flows, and to furnish a continuous supply of timber for the use and needs of the citizens of the U.S. It was not the purpose or intent of these provisions to authorize the inclusion of lands more valuable for their minerals or for agriculture than for forest purposes (16 United States Code § 475). The Organic Administration Act does not allow the Forest Service to unreasonably circumscribe or prohibit reasonably necessary activities under the Mining Law of 1872 that are otherwise lawful.

1.7.3 Mining and Minerals Policy Act of 1970
This Act states that the continuing policy of the Federal Government is to foster and encourage private enterprise in the development of economically sound and stable domestic mining and minerals industries and the orderly and economic development of domestic mineral resources.

1.7.4 Locatable Minerals — 36 CFR 228, Subpart A
Federal regulations at 36 CFR 228, Subpart A set forth the rules and procedures that enable use of the surface of NFS lands in connection with operations authorized by mining laws. These laws confer a statutory right to enter public lands to search for minerals. The USFS developed its regulations for locatable minerals to ensure mining-related activities are conducted in a manner that minimizes adverse environmental impacts on USFS surface resources.

36 CFR 228 regulations specifically authorize the USFS to calculate and hold a reclamation bond for approved mining operations on NFS lands.

1.7.5 Executive Order 13007 and the National Historic Preservation Act
Executive Order 13007 requires that Federal agencies contact Indian tribes regarding effects, and the National Historic Preservation Act’s Section 106 regulations require consultation with Indian tribes to identify and resolve adverse effects to historic properties. The Memorandum for the
Heads of Executive Departments and Agencies entitled Government-to-Government Relations with Native American Tribal Governments, signed by President Clinton on April 29, 1994, outlines principles that federal agencies must follow when interacting with federally-recognized Native American tribes in deference to Native Americans’ rights to self-governance. Specifically, federal agencies are directed to consult with tribal governments prior to taking actions that affect federally recognized tribes and to ensure that Native American concerns receive consideration during the development of federal projects and programs.

1.7.6 National Environmental Policy Act (NEPA)
The NEPA declares a national environmental policy and promotes consideration of environmental concerns by federal agencies in decision-making. Procedures and regulations issued by the Council on Environmental Quality (CEQ), as authorized under NEPA, direct implementation of NEPA by federal agencies. The CEQ’s regulations are promulgated at 40 CFR Parts 1500–1508. Also, the USFS direction pertaining to implementation of NEPA and CEQ’s regulations is contained in Chapter 20 of USFS Handbook 1909.15 (Environmental Policy and Procedures).

1.7.7 Montana Environmental Policy Act (MEPA)
Procedures that govern state decision-making processes on state, federal, and private lands in Montana are defined in the administrative rules that implement the MEPA. Under this law and implementing regulations, an EIS must be prepared whenever any action taken by a state agency “significantly affects the quality of the human environment”. This environmental assessment will determine if an EIS is appropriate for this project.

1.7.8 Forest and Rangeland Renewable Resource Planning Act of 1974 and National Forest Management Act of 1976
In response to requirements set forth in these two Acts, final rules on National Forest System Land and Resource Management Planning established specific minimum management requirements to be met in accomplishing the goals and objectives for National Forest System lands. These requirements were intended to guide the development, analysis, approval, implementation, monitoring, and evaluation of forest plans.

1.7.9 Montana Metal Mine Reclamation Act Rules and Regulations for Exploration in Montana
MDEQ administers the MMRA, under which SMC has applied for an amendment to its exploration license. The MMRA’s purpose is to ensure that the usefulness, productivity, and scenic values of all lands and surface waters affected by mining and exploration receive the greatest reasonable degree of protection and that the lands are reclaimed to beneficial uses. Other purposes of the Act are to allow mining as an activity beneficial to the economy of Montana and to allow the production of minerals to meet the needs of society and the economic demands of the marketplace (82.4.302(b) and (c), MCA). The Act and its rules define the steps to be taken in issuing an exploration license, operating permit, or revising an approved operating plan for reclamation of an applicant’s proposed or modified exploration plan or mine operation. A finding that the mining or reclamation plan would violate laws administered by DEQ would be grounds to deny a permit or license amendment (82–4–351, MCA).

MDEQ also sets reclamation bonding under MMRA. If this exploration license amendment is
approved, additional bonds would be calculated using the specifications and stipulations of the approved amendment. The bonds would include costs such as backfilling the decline; re-contouring access roads; demolition of buildings and other structures; regrading and soil replacement; seedbed preparation; and revegetation. The bond would include costs of weed control and reseeding if the first attempt fails. Bonds must be submitted and accepted before the proposed amendment could be permitted by DEQ or an authorization to proceed could be granted by the USFS. The applicant must submit the reclamation performance bond with the department in a form and amount determined adequate by the department in accordance with 82-4-338, MCA; and not be in default of any other reclamation obligation mandated by the Act or rules implementing the Act.

A newly approved amendment to an approved exploration license cannot be implemented unless and until other associated permits and plans have been approved. These include any new or revised water discharge or air quality permits regulated by MDEQ and other permits or approvals required by other State or Federal agencies.

As defined in Administrative Rules of Montana (ARM) 17.24.102 (13), reclamation means the return of lands disturbed by mining or mining-related activities to an approved post-mining land use which has stability and utility comparable to that of the pre-mining landscape. The term reclamation does not mean restoring the landscape to its pre-mining condition. Reclamation, where appropriate, may include, but is not limited to: closure activities for waste rock dumps and surface openings; grading, soiling and revegetating disturbed lands; removal of buildings and other structures that have no utility in regard to the approved post-mine land use; other steps necessary to assure long-term compliance with Title 75, chapters 2 and 5, MCA; and other steps necessary to protect public health and safety at closure.

Per 17.24.103 (c) The plan of operations must state the type of exploration techniques that would be employed in disturbing the land and include a reclamation plan in sufficient detail to allow the department to determine whether the specific reclamation and performance requirements of ARM 17.24.104 through 17.24.107 would be satisfied. The applicant must agree to reclaim any surface area disturbed by the applicant during exploration operations, all as may be reasonably required by the department, unless the applicant shall have applied for and been issued an operating permit for the lands so disturbed.

MDEQ may waive any of the exploration criteria listed in the regulations if the applicant proposes methods or technologies that achieve the same or better environmental protection than that expected under the given criteria.

In ARM 17.24.105, all suitable practically salvaged soil and soil material must be salvaged prior to any other site disturbance, and either stockpiled or used for immediate reclamation.

Areas disturbed by removal of vegetation or grading must be kept to the minimum size necessary to accommodate the exploration operation. The department may require interim revegetation for the purposes of erosion control on all exploration disturbance areas.

Exploration adits, shafts, and other excavations must be secured from unauthorized entry throughout the life of the operation to ensure public safety.

1.7.10 Montana Water Quality Act and Federal Clean Water Act
MDEQ is responsible for administering several water quality statutes. MDEQ administers several sections of the Federal Clean Water Act pursuant to an agreement between the State of
Montana and the U.S. Environmental Protection Agency. The State of Montana, through MDEQ, has been delegated authority for administering nonpoint source pollution prevention programs, the National Pollutant Discharge Elimination System program, and Water Quality Standards. The Montana Water Quality Act (WQA) provides a regulatory framework for protecting, maintaining, and improving the quality of water for beneficial uses. Pursuant to the WQA, MDEQ has developed water quality classifications and standards, as well as a permit system to control discharges into State waters. Mining operations must comply with Montana’s regulations and standards for surface water and groundwater.

MDEQ may also authorize short-term exemptions from Montana’s surface water quality turbidity standards for construction projects that affect water bodies. This authorization must be obtained before the applicant may begin the construction activity.

**1.7.11 Montana Water Use Act**

The Montana Water Use Act of 1973 provides for acquiring new water rights and changing existing water rights through the new appropriations program; and a centralized water right record system. The DNRC Water Rights Bureau administers the Montana Water Use Act under Title 85, Chapter 2, Montana Code Annotated. The Montana Water Use Act established a permit system for new uses of water and for changes to existing water rights. Any person planning a new or expanded development for a beneficial use of water from surface water or ground water after June 30, 1973, must obtain a permit to appropriate water or file a Notice of Completion of Ground Water Development to get a Certificate of Water Right. Additionally, if a proposed project will result in a change to the point of diversion, place of use, purpose of use, or place of storage, a water right owner must obtain a change authorization before work begins on the project. SMC would be required to comply with the Montana Water Use Act for beneficial water uses.

**1.7.12 Safe Drinking Water Act**

The Safe Drinking Water Act is the main federal law that ensures the quality of Americans' drinking water. The Safe Drinking Water Act as amended requires completion of Source Water Delineation and Assessment Reports, which have been completed for numerous public water supplies in the Benbow area. Any drinking water system developed as a part of the Benbow Portal Project would need to be in compliance with state and federal Safe Drinking Water Act regulations.

The U.S. Environmental Protection Agency (EPA) Region 8 Underground Injection Control (UIC) Program regulates injection wells in accordance with 40 CFR Parts 144 and 146, which have been promulgated under Part C of the Safe Drinking Water Act, 42 United States Code Sections 1421 through 1428. EPA has determined that SMC’s proposed injection well would be "authorized by rule" in accordance with 40 CFR Sections 144.24 and 144.84(a) (see August 6, 2014 letter in project record).

**1.7.13 Montana Clean Air Act and Federal Clean Air Act**

The Federal Clean Air Act is the comprehensive federal law that regulates air emissions from stationary and mobile sources. MDEQ administers the Clean Air Act of Montana as delegated by the Federal Government under the Federal Clean Air Act. Under the Montana Clean Air Act, a facility must obtain an air quality permit before construction or a change in operation, unless a permit is not required under ARM 17.8.705. Activities proposed under the Plan of Operations
and associated air emissions have been permitted through the State of Montana Air Resources Management Bureau. A copy of Air Quality Permit #2459-16 is provided in Appendix E and includes diesel emissions, fugitive particulate emissions, and proposed propane emissions at both the Stillwater Mine and the proposed Benbow Portal.

1.7.14 Montana Dam Safety Act
If a mineral exploration operation proposes construction of a dam that exceeds a certain size, it would be classified as a high-hazard dam and subject to design review and approval before construction from the Montana Department of Natural Resources and Conservation’s (DNRC) Dam Safety Bureau. When a dam has an impoundment capacity of 50 acre-feet or more, DNRC classifies the hazard of that dam by the potential loss of life downstream if the dam fails. SMC’s proposed Land Application Disposal (LAD) Storage Pond design was completed based on the “Earth Dam and Reservoirs TR-60” guidelines produced by the USDA as well as the Montana DNRC “Dam Safety Program Technical Note 6 Downstream Hazard Classification Procedures for Montana Dams.” Construction and operation of such a dam would be regulated under MMRA, rather than a DNRC dam safety permit, during mine operation and closure until reclamation bond release. After the reclamation bond is released, such a structure would be subject to DNRC oversight and regulation if it remains at closure.

1.7.15 Best Management Practices
Soil and water conservation best management practices (BMPs) are the primary mechanism to minimize water quality impacts from non-point source pollution and still allow dispersed land management activities to occur on National Forest land. To reach these objectives the Forest Service developed the R1/R4 Forest Service Soil and Water Conservation Practices Handbook (USDA 1988) and a National Best Management Practices for Water Quality Management on National Forest System Lands (USDA 2012). While Region 1 of Forest Service has actively embraced the Montana State Forestry BMPs and the associated interagency/interdisciplinary review process, the USFS National Core BMP program provides a range of BMPs for activities not captured under the Montana State Forestry BMPs, including mineral exploration. During implementation, the Benbow Portal project will be required to apply both Montana State Forestry BMPs and Forest Service National Core BMPs where applicable.

1.7.16 Other Applicable Laws, Regulations, and Policy
A list of Federal and state laws and Executive Orders (EO) pertaining to project specific planning and environmental analysis on Federal lands follows. While most pertain to all Federal lands, some of the laws are specific to Montana. Disclosures and findings required by these and other applicable laws and orders are contained in Chapter 3 of the EA.

- Executive Order 11593 (cultural resources).
- Executive Order 11988 (floodplains).
- Executive Order 11990 (wetlands).
- Executive Order 12898 (environmental justice).
- Executive Order 12962 (aquatic systems and recreational fisheries).
- Migratory Bird Treaty Act of 1918 (as amended) and associated Executive Order 13186
1.8 PERMITS

Wetlands, riparian areas, and streams will be protected through design/mitigation measures, and it is unlikely that water quality permits would be needed. If necessary, SMC would obtain the following permits to comply with Federal and state laws:

- **Montana Streamside Protection Act (SPA 124 Permit)** - Any project including the construction of new facilities or the modification, operation, and maintenance of an existing facility that may affect the natural existing shape and form of any stream or its banks or tributaries (Montana Department of Fish, Wildlife, and Parks).

- **Federal Clean Water Act (Section 404 Permit)** – Any activity that will result in the discharge or placement of dredged or fill material into waters of the United States, including wetlands (U.S Army Corp of Engineers).

- **Short-Term Water Quality Standard for Turbidity (318 Authorization)** – Any activity in any State water that will cause unavoidable short-term violations of water quality standards. "State water" includes any body of water, irrigation system, or drainage system, either surface or underground, including wetlands, except for irrigation water where the water is used up within the irrigation system and the water is not returned to other State water.

- **Storm Water Pollution Prevention Plan (SWPP)** - A “storm water discharge associated with construction activity,” as defined in ARM 17.30.1102(28), requires permit coverage. If a storm water discharge to State waters occurs, construction activity which results in the “disturbance” of equal to or greater than one acre of total land area would need to obtain permit coverage. The goal of the SWPPP is to identify all potential pollutant sources that may impact storm water, and identify the Best Management Practices to control these pollutant sources.

1.9 INFORMATION SOURCES

The analysis and decision processes for this project are based on the consideration of the best available science. The manner in which best available science is addressed can be found within the disclosure rationale throughout the EA and the project planning record.
2 ALTERNATIVES CONSIDERED

2.1 INTRODUCTION

Chapter 2 describes a No Action Alternative (Alternative 1), Proposed Action Alternative (Alternative 2) and Agency Mitigated Alternative (Alternative 3) and provides a rationale for alternatives not studied in detail. Chapter 2 also summarizes project design/mitigation features to protect resources, proposed monitoring, past, present, and reasonably foreseeable future actions considered in a cumulative effects analysis in Chapter 3, and consistency with the Custer Forest Plan.

2.2 NO ACTION ALTERNATIVE (ALTERNATIVE 1)

For the purposes of analysis and disclosure, under the No Action Alternative, Stillwater Mining Company would not develop the Benbow exploration portal and related support facilities as described in the Plan of Operations.

Per Federal regulations (40 CFR 1502.14(d)), a No Action Alternative is analyzed. Federal mining regulations at 36 CFR 228a provide the Forest Service authority to impose reasonable environmental controls on a mineral exploration operation, but do not provide authority to disapprove a reasonable operating plan for a mineral exploration operation which will be conducted in an environmentally responsible manner and does not violate State or Federal statute. The No Action Alternative is an example of a reasonable alternative outside the jurisdiction of the agency which must be analyzed. The No Action Alternative provides a comparison of environmental conditions without the proposal and establishes a baseline for evaluating the other alternatives.

2.3 PROPOSED ACTION ALTERNATIVE (ALTERNATIVE 2)

The Proposed Action is Stillwater Mining Company’s Plan of Operations with modifications to the LAD facilities and no beneficial waste rock uses. The Plan of Operations describes the proposed mineral exploration and related environmental protection requirements. The Plan of Operations is available upon request or on the following USFS website:
http://www.fs.usda.gov/detail/custer/landmanagement/projects/?cid=stelprd3816002

Following is a brief summary of Stillwater Mining Company’s Plan of Operations.

Stillwater Mining Company is proposing the construction of the Benbow exploration portal near Dean, Montana. The exploration portal would be connected to an underground exploration decline, which is an inclined shaft used to transport workers, equipment, and materials in the underground working area. The exploration decline would also contain equipment used to minimize water inflows and capture and route water encountered throughout the development work. The Plan of Operations proposes use of conventional drill and blast mining techniques to drive a nominal 1.1 mile decline from the Benbow portal pad to underground workings from the Stillwater Mine near Nye, Montana. There would also be limited lateral underground development to the east and west to facilitate underground exploration activities. The purpose of this exploration portal/decline would be to evaluate mineralized resources at the far eastern extent of the J-M Reef within Stillwater’s mining claim package. Assuming economical mineralized resources are present, Stillwater Mining Company indicates that the long-term use of
the Benbow portal/decline would be to provide underground ventilation support, secondary escape-way for underground personnel, and limited mine resupply.

Under existing approved operations, Stillwater Mining Company is currently developing underground mine workings from the Stillwater Mine (i.e. west to east). Stillwater’s intent is to drive mine workings approximately 25,000 feet to the eastern extent of the J-M Reef. If the Plan of Operations is approved, the portal/decline would be developed from the north and would eventually link into these mine workings. Following completion of exploration activities and if exploration warrants mining, Platinum Group Metal ore from the Blitz Project Area would be returned to the Stillwater Mine via underground transport for processing within the existing concentrator and lined tailings facilities at the Stillwater Mine near Nye, Montana. Pending the connection of the Benbow decline to the mine workings, waste rock and mine water would be temporarily managed within the Benbow project area. Once the connection is complete (anticipated within 3 to 5 years after Plan of Operations approval), all future produced waste rock and water would then be directed to the Stillwater Mine for management within existing permitted facilities and subject to the associated permit requirements.

To support development of the Benbow exploration portal, Stillwater Mining Company would require surface infrastructure in the Benbow area including a portal pad, an access road, waste rock management facilities, a water well, a water treatment plant, and a water disposal system. To the extent possible and to minimize disturbances, Stillwater Mining Company designed the project to primarily use existing Forest Service roads and trails to support the project.

As the decline is driven and developed, groundwater would be intercepted. In addition, surface water from precipitation would intercept the waste rock pile, portal pad, and access road system. Groundwater and surface waters that contact waste rock from conventional mining (i.e. drill and blast) may contain nitrogen compounds. This water would require treatment to meet State water groundwater quality standards prior to disposal. Under the Proposed Action, Stillwater Mining Company would construct a water treatment plant to remove nitrogen compounds to State water quality standards. A LAD system would be used to dispose of treated water.

On October 28, 2014, Stillwater Mining Company provided revised information on the LAD facility configuration, including changes to water pipeline routes and modifications to LAD pivot sizes and locations. The Proposed Action includes these updates to the LAD facilities, as reflected in Figure 2.1.

Under the Proposed Action, all waste rock generated during portal development would be placed in an onsite waste rock pile with associated management facilities, including a high-density polyethylene (HDPE) liner and biological water treatment system. Minor amounts of waste rock would be used to surface roads used for project access.

On December 9, 2014 SMC provided a revised proposed construction schedule to replace the schedule originally included as Plan of Operations Appendix M. The revised schedule proposes surface facility construction (access road, portal pad, power lines, pipelines, LAD facilities, water treatment facilities) from September 2015 through spring 2016. Portal entrance and underground construction would begin in August 2016 and end in August 2019. Waste dump closure and surface facilities decommissioning would occur in fall 2019.

On March 6, 2015 SMC submitted a proposal to install a water well on the Benbow Portal Pad to supply water for development and exploration purposes (see project record). The well would be
drilled at a 60 degree incline to 1,385 feet depth to allow water extraction from the Madison Limestone formation. The well would be installed immediately following construction of the portal pad, but prior to initiation of portal development and exploration activities, which is anticipated to be in March or April 2016. No additional surface disturbance is proposed based on this location. Once installed, if the water quality from the well meets drinking water standards, this well would also be used to supply an additional 20 gpm of potable water to portal pad facilities, bringing the total flow to approximately 100 gpm. The MDEQ Potable Water Section has an extensive suite of parameters including salts, metals, radiologic, volatile, and semi-volatile organic compounds that must be analyzed prior to permitting a well as a potable supply. Assuming the proposed water well meets drinking water standards, the existing well near Little Rocky Creek would be closed and the proposed water and power line from the well to the portal pad would not be necessary. The water supply well would be collared on the Portal Pad, drilled at a 60 degree incline, and permitted as a non-community water supply through MDEQ. This well proposal is included in this analysis as part of the proposed activities under Alternative 2.

A Forest Plan Amendment would be required as part of Alternative 2 to address a conflict between goshawk Management Indicator Species and Management Area goals. Refer to the Forest Plan consistency discussion in Section 2.7.4.

2.3.1 Proposed Action Mitigation Measures
In addition, the Proposed Action Alternative would include mitigation measures determined to be necessary to ensure compliance with applicable law/regulation/policy as detailed below. Mitigation measures are listed by resource area as they apply to the Proposed Action Alternative.

2.3.1.1 Proposed Action Alternative Range Management/LAD Mitigations
To comply with Forest Plan Management Area B goals, minimize impacts to livestock management, vegetation, and soils, the Proposed Action Alternative would require the following changes/modifications/special mitigations to LAD facility operations and existing grazing management:

1. Stillwater Mining Company would install additional fencing, pipelines, and stock tanks (see Figure 2.2 and Table 2.1) to better facilitate ongoing livestock management in areas affected by the LAD system. This would include creating two new pastures and additional water sources to redistribute livestock grazing within the LAD affected areas of the existing Little Rocky Grazing Allotment. During LAD operations, Stillwater Mining Company would be responsible for maintaining these range improvements.

2. The USFS would authorize changes to the pasture system and livestock stocking rates in the Little Rocky Grazing Allotment to account for increased production in irrigated areas under LAD pivots as detailed in Table 2.2. The grazing capacity would follow that estimated by the GIS Grazing Capacity Model for the LAD pasture configuration (Figure 2.3). The three existing Term Grazing Permits would be modified to include these changes during LAD operations.
NOT FOR CONSTRUCTION

Figure 2.1. Proposed Action Alternative Map.

NOTES:
1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ACCOMPANYING DRAWINGS AND TECHNICAL SPECIFICATIONS.
   THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE OWNER'S REPRESENTATIVE SHOULD UNCERTAINTIES ARISE
   WITH CONSTRUCTION DRAWINGS AND TECHNICAL SPECIFICATIONS.
2. COORDINATE GRID IS SMC 6000.
3. PLAN BASED ON INFORMATION PROVIDED BY STILLWATER MINING COMPANY.
4. DETAILED MAPPING CONTINUE INTERVAL IS 5 FEET. CONTOUR INTERVAL OUTSIDE OF DETAILED MAPPING IS 10
   FEET.
5. PIPEWORK AND POWERLINES SHOWN ADJACENT TO ROAD ALIGNMENTS. PIPEWORK AND POWERLINES TO BE
   INSTALLED ALONG THE ROAD ALIGNMENTS. PIPEWORK AND POWERLINES DETAILS TO BE PROVIDED BY OTHERS.
6. NEW MONITORING WELLS TO BE INSTALLED DOWNSTREAM OF LAD POND. CO-ORDINATES WILL BE PROVIDED BY SMC.

REFERENCE DRAWINGS

DESCRIPTION

REFERENCE DRAWINGS

DESCRIPTION

DRAWN

CHECKED

REVISIONS

DESIGN

Dated

APPROVED

DATE

DRAWING NO.

P/A NO.

REVISION

STILLWATER MINING COMPANY

BLITZ PROJECT

BENBOW PORTAL

PIPEWORK AND POWERLINES

PLAN WITH LAD STORAGE POND

PROPOSED PIPELINE

ALIGNMENTS TO LAD

STORAGE POND

CUSTER NATIONAL

FOREST BOUNDARY

EXISTING

FENCE LINE

LAD

STORAGE POND

Irrigation pivots

(by Others)

Transformer substation

Transformer

Proposed monitoring well

Proposed monitoring well (See Note 6)
Table 2.1. Little Rocky Grazing Allotment LAD Range Improvements.

<table>
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<td>LAD NORTHWEST STOCKWATER PIPELINE</td>
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<tr>
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</tr>
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<td>LAD NORTHWEST STOCK TANK</td>
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</tr>
<tr>
<td></td>
<td>TOTAL NUMBER</td>
<td>PROPOSED TANKS</td>
</tr>
</tbody>
</table>

3. To facilitate grazing beneath each pivot, LAD water would be distributed on a rotating schedule as shown in Table 2.3. The schedule and distribution of water takes into consideration the area under each pivot and would fully dewater the LAD storage pond by the end of the LAD season while still accommodating grazing in the Little Rocky Allotment. Water would be applied at all pivots for the first 60 days of the LAD season (from May 1 to July 1) prior to cattle grazing in the pivot areas. After this period, application of water at an individual pivot would be shut down for 14 days to facilitate drying soil beneath the pivot prior to grazing. Water would not be applied in individual LAD pivot areas during grazing of each area.

4. To prevent erosion from soil saturation and overland water flow, Stillwater Mining Company would cease LAD water application for at least one day in the event that greater than ½” of rain falls within one day at the LAD area.

5. To prevent erosion from soil saturation and overland water flow, Stillwater Mining Company would monitor rainfall and conduct daily visual monitoring under LAD pivot areas being used during operations. Stillwater Mining Company would cease or cut back rates of LAD water application in the event that surface overland flow of water is observed running off the LAD pivot areas.
Figure 2.2. Benbow LAD and Range Livestock Grazing Mitigation Plan map.
Table 2.2. Little Rocky Allotment Grazing Rotation Schedule with LAD.

<table>
<thead>
<tr>
<th></th>
<th>NUMBER OF LIVE-STOCK</th>
<th>CLASS *</th>
<th>NUMBER OF DAYS</th>
<th>DATE ON</th>
<th>DATE OFF</th>
<th>HEAD MONTHS</th>
<th>CONVERSION FACTOR</th>
<th>AUMS**</th>
<th>% AUMs</th>
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<tr>
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<td>7/15</td>
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<td></td>
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<td>C/C</td>
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<td>340</td>
<td></td>
<td>449</td>
<td>100%</td>
</tr>
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*CLASS = Class of livestock. C/C indicates cow/calf pair.  **AUM = 780# dry matter per cow per month.
Figure 2.3. Alternative 2 grazing capacity and allowable use parameters.
<table>
<thead>
<tr>
<th>IRRIGATION TIMING AND ACTIVITY</th>
<th>LAD IRRIGATION DAYS ON</th>
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<th>END DATE</th>
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<td>LAD PIVOT 1 WEST PASTURE PIVOT NOT IRRIGATING</td>
<td>25</td>
<td></td>
<td>8/12</td>
<td>9/4</td>
</tr>
<tr>
<td>LAD PIVOT 1 WEST PASTURE PIVOT IRRIGATING</td>
<td>25</td>
<td></td>
<td>9/5</td>
<td>10/1</td>
</tr>
<tr>
<td>PIVOT 1 ANNUAL TOTAL DAYS</td>
<td>128</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAD PIVOT 2 PASTURE PIVOT IRRIGATING</td>
<td>113</td>
<td></td>
<td>5/1</td>
<td>8/21</td>
</tr>
<tr>
<td>LAD PIVOT 2 PASTURE PIVOT NOT IRRIGATING</td>
<td>21</td>
<td></td>
<td>8/22</td>
<td>9/11</td>
</tr>
<tr>
<td>LAD PIVOT 2 PASTURE PIVOT IRRIGATING</td>
<td>19</td>
<td></td>
<td>9/12</td>
<td>10/1</td>
</tr>
<tr>
<td>IRRIGATION TIMING AND ACTIVITY</td>
<td>LAD IRRIGATION DAYS ON</td>
<td>LAD IRRIGATION DAYS OFF</td>
<td>START DATE</td>
<td>END DATE</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------------</td>
<td>-------------------------</td>
<td>------------</td>
<td>---------</td>
</tr>
<tr>
<td>PIVOT 2 ANNUAL TOTAL DAYS</td>
<td>132</td>
<td>21</td>
<td></td>
<td></td>
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<tr>
<td>LAD PIVOT 3 PASTURE PIVOT IRRIGATING</td>
<td>119</td>
<td></td>
<td>5/1</td>
<td>8/28</td>
</tr>
<tr>
<td>LAD PIVOT 3 PASTURE PIVOT NOT IRRIGATING</td>
<td>24</td>
<td></td>
<td>8/29</td>
<td>9/21</td>
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<tr>
<td>LAD PIVOT 3 PASTURE PIVOT IRRIGATING</td>
<td>10</td>
<td></td>
<td>9/22</td>
<td>10/1</td>
</tr>
<tr>
<td>PIVOT 3 ANNUAL TOTAL DAYS</td>
<td>129</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YEARS 2 AND 4 ANNUAL TOTAL DAYS ALL PIVOTS</td>
<td>389</td>
<td>70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. To prevent potentially adverse vegetation and soil impacts due to grazing and irrigation in the LAD areas, Stillwater Mining Company would monitor soil conditions, erosion, plant species composition changes, and forage utilization in LAD pasture areas upon cessation of annual grazing. A specific monitoring plan would be jointly developed by Stillwater Mining Company and Forest Service/Montana DEQ and could consist of ocular reconnaissance for compositional shifts, installing monitoring cages, forage clipping, soil sampling, photo points, and visual monitoring. SMC would conduct the monitoring observations. SMC would fund the monitoring and the USFS would provide the training needed. SMC would do the ocular reconnaissance of compositional changes at the same time as utilization studies on sites and provide a subjective write-up in the annual report to the agencies. SMC would resample the plots 5 years after reclamation is completed.

7. The Forest Service may require that the LAD schedule, grazing schedule, or AUM’s be adjusted in the event that monitoring indicates excessive soil impacts (compaction, erosion, etc.) or forage overuse (>60% dry weight forage utilization) in LAD pivot areas, particularly around stock tanks, or along fences. Upon completion of LAD use, the stocking rate would be adjusted to account for decreased forage production due to removal of irrigation water.

8. Upon cessation of LAD use, reclamation bond for removal of fences dividing pastures, stock tanks, and pipelines would be released. These improvements would then be owned by the USFS with range permittees responsible for future use and related operations/maintenance.

9. Upon cessation of LAD and use of the LAD storage pond and laydown area, SMC would remove the fences around the LAD storage pond and laydown area as needed to complete reclamation and then reconstruct the fences as needed to prevent grazing impacts until vegetation establishes (see reclamation mitigations).

10. To reduce potential for conflicts between public motorized vehicle use and LAD/grazing operations, LAD access Road #241418 would be closed to public motorized use from 5/1 to 10/15 until reclamation in the LAD area is deemed
complete. It is anticipated that this closure would be in place for 4 to 7 years, contingent upon reclamation conditions. Closure would be implemented via installing a road access gate meeting typical Forest Service gate design with appropriate signage.

11. To reduce potential soil salinity increases and to monitor soil fertility over LAD operations, SMC would follow the Stillwater Mine Hertzler Ranch LAD system operating and monitoring plan for water and soil analyses and add additional mitigations recommended by its consultant for the Hertzler Ranch LAD Area (SMC 2013) on the Benbow LAD Area. This would include the following for the Benbow LAD Area:
   a) Apply ½ inch of water per pivot pass (instead of running pivots at 100 percent and only applying ¼ inch per pass) to limit salt buildup on the soil surface and to limit increased electrical conductivity (EC) and the sodium absorption ratio (SAR) in surface soils. The extra water would ensure that salts would not build up on vegetation and in the soil surface.
   b) Sample the surface 0 to 6 inches of soil twice per year for Olsen (sodium bicarbonate) phosphorus in addition to total phosphorus. Sampling would ensure adequate fertility in the LAD area soils to allow for maximum plant update of nitrogen and water.
   c) Sample the surface 0 to 6 inches of soil twice per year for ammonium acetate potassium in addition to total potassium. Sampling would ensure adequate fertility in the LAD area soils to allow for maximum plant update of nitrogen and water.
   d) Sample LAD pond water twice per year for EC, SAR, bicarbonates, total Kjeldahl nitrogen, ammonia, and nitrates plus nitrites. Timing of water sampling should be the beginning of the irrigation season and again in late-August. This sampling would ensure that the pond water was not increasing in these parameters over the operational life of the LAD system.
   e) Sample LAD pivot area soils twice per year to track EC and SAR levels. This sampling would ensure continued safe levels of salts in soils and minimal impacts to compositional shifts in vegetation.

12. To consolidate areas of disturbance, consolidate post-reclamation weed monitoring/ treatment areas, and reduce impacts to the Idaho fescue/bluegrass habitat type, SMC would be required to investigate the potential to move the LAD storage pond to the area adjacent to the LAD laydown area. If that proves infeasible, the LAD laydown area would be relocated to be immediately adjacent to the LAD pond. SMC and the USFS/MDEQ would conduct a field review of the proposed laydown area boundary and try to modify the boundary and limit impacts to plant communities dominated by native mid-grasses. The LAD laydown area is proposed along the boundary of the habitat type dominated by native midgrasses and the shrubby cinquefoil/timothy habitat type. The Agencies are confident that the proposed rectangular laydown area can be modified to either reduce the overall laydown area size or change the shape to avoid some portions of the native midgrass dominated areas. Consolidating the LAD pond and
laydown areas could reduce construction impacts to the grassland in high-seral condition.

13. SMC would be required to salvage soil along major access corridors on native soils in the LAD laydown area and along the access road between the LAD laydown area and the LAD storage pond. The access corridors would have to be graveled during operations. At closure, SMC would be required to remove the gravel and rip compacted surfaces as specified in Mitigation 17 before the stored soil is replaced. This practice would limit heavy equipment traffic impacts to vegetated soils along the access corridors.

### 2.3.1.2 Proposed Action Alternative Reclamation Mitigations

To ensure that reclamation occurs in compliance with 36 CFR 228a, Montana Code Annotated Title 82 Chapter 4 Part 3 and the Custer Forest Plan, the Proposed Action Alternative would require the following changes/modifications/special mitigations:

1. As deemed necessary by the USFS, dependent upon impacts observed during LAD irrigation pivot operations, Stillwater Mining Company may be required to mitigate center pivot wheel impacts during operations and develop and implement a final reclamation plan for such impacts. Potential operational adaptive management measures could include, but not be limited to, placing gravel in pivot wheel tracks during operations. Potential reclamation measures could include, but not be limited to, removing or scattering gravel, replacing topsoil in pivot wheel areas, ripping compacted soils, and reseeding the rut areas.

2. Stillwater Mining Company would reestablish vegetation in areas cleared of vegetation by exploration and reclamation activity to minimize weed spread by implementing revegetation measures, facilitate soil organic matter recovery, and restore ground cover in the Plan of Operations and the following measures:
   a) Ensure all seed mixes utilized are certified noxious weed free.
   b) Maintain stockpiled material (gravel, topsoil, etc.) and areas disturbed by project activities in a noxious weed-free condition.
   c) Revegetate all disturbed soil, except the travel way on surfaced roads, as soon as possible and in a manner that optimizes plant establishment for that specific site, unless ongoing disturbance at the site will prevent weed establishment.

3. To comply with Management Area B forested vegetation goals, SMC would use slightly different certified noxious weed free seed mixes and include some woody species planting for the major plant communities located in the forested disturbance areas as listed in Table 2.4. Reducing the amount of native perennial grass seed by half, seeding appropriate forb species, and including some native shrub and tree planting may decrease the amount of time needed to replace the Douglas-fir/mallow ninebark plant communities.
Table 2.4. Forested plant community seed mix.

<table>
<thead>
<tr>
<th>Species</th>
<th>Seeding Rate (pounds PLS/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Native perennial grasses</td>
<td></td>
</tr>
<tr>
<td>Pinegrass</td>
<td>1.0 if available**</td>
</tr>
<tr>
<td>Bluebunch wheatgrass</td>
<td>2.0</td>
</tr>
<tr>
<td>Slender wheatgrass</td>
<td>2.5</td>
</tr>
<tr>
<td>Mountain brome</td>
<td>2.5</td>
</tr>
<tr>
<td>Idaho fescue</td>
<td>1.0</td>
</tr>
<tr>
<td>Big bluegrass</td>
<td>0.5</td>
</tr>
<tr>
<td>Columbia needlegrass</td>
<td>1.0 if available**</td>
</tr>
<tr>
<td>Subtotal</td>
<td>10.5</td>
</tr>
<tr>
<td>Native perennial forbs</td>
<td></td>
</tr>
<tr>
<td>Arrowleaf balsamroot</td>
<td>2.0</td>
</tr>
<tr>
<td>Heartleaf arnica</td>
<td>1.0 if available</td>
</tr>
<tr>
<td>Yarrow</td>
<td>0.1</td>
</tr>
<tr>
<td>Silky or silvery lupine</td>
<td>1.0</td>
</tr>
<tr>
<td>(Lupinus argenteus)</td>
<td></td>
</tr>
<tr>
<td>Subtotal</td>
<td>4.1</td>
</tr>
<tr>
<td>Total Seed</td>
<td>14.6</td>
</tr>
</tbody>
</table>

Native shrubs and trees seedlings

Douglas fir seedlings 50/acre
Ninebark seedlings 50/acre
Total Plant Seedlings 100/acre

* PLS = pure live seed/acre
**If specific seeds are not commercially available, SMC would propose a substitute species for approval by the USFS and MDEQ. Substitution could include increasing the PLS of other approved species.

4. To comply with Management Area B vegetation goals in shrubby cinquefoil/Idaho fescue plant community areas, SMC would attempt to improve native perennial midgrass species abundance on sites currently dominated by less desirable non-native species as much as possible by using certified noxious weed free seed in the Table 2.5 seed mix. The heavy seeding of the desirable native midgrasses may reduce the potential reinvasion of timothy and establishment of Kentucky bluegrass and cheatgrass in the disturbed and reclaimed plant community.
Table 2.5. Shrubby cinquefoil/Idaho fescue plant community seed mix.
For use at LAD laydown and LAD Pivot 1 area, including adjacent roads/pipelines.
Native shrubs and tree seedlings would be planted only during final reclamation.

<table>
<thead>
<tr>
<th>Species</th>
<th>Seeding Rate (pounds PLS/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Native perennial grasses</td>
<td></td>
</tr>
<tr>
<td>Bluebunch wheatgrass</td>
<td>8.0</td>
</tr>
<tr>
<td>Slender wheatgrass</td>
<td>5.0</td>
</tr>
<tr>
<td>Idaho fescue</td>
<td>5.0</td>
</tr>
<tr>
<td>Subtotal</td>
<td>18</td>
</tr>
<tr>
<td>Native perennial forbs</td>
<td></td>
</tr>
<tr>
<td>Arrowleaf balsamroot</td>
<td>4.0</td>
</tr>
<tr>
<td>Yarrow</td>
<td>0.05</td>
</tr>
<tr>
<td>Silky or silvery lupine</td>
<td>2.0</td>
</tr>
<tr>
<td>Subtotal</td>
<td>6.05</td>
</tr>
<tr>
<td>Native shrubs</td>
<td></td>
</tr>
<tr>
<td>Shrubby cinquefoil (lbs. of seed)</td>
<td>2.0</td>
</tr>
<tr>
<td>Total Seed</td>
<td>26.05</td>
</tr>
<tr>
<td>Native shrubs and trees seedlings</td>
<td></td>
</tr>
<tr>
<td>Shrubby cinquefoil plants/acre</td>
<td>100/acre</td>
</tr>
<tr>
<td>Total Plant Seedlings</td>
<td>100/acre</td>
</tr>
</tbody>
</table>

*PLS = pure live seed/acre

5. To comply with Management Area B vegetation goals, SMC would maintain the dominance of native perennial midgrass species where they are currently the most abundant overstory or understory species as much as possible by using certified noxious weed free seed in the Table 2.6 seed mix in Bluebunch wheatgrass/Idaho fescue plant communities.

Table 2.6. Bluebunch wheatgrass/Idaho fescue plant community seed mix.
For use at LAD Pivot Areas 2 and 3, including adjacent roads/pipelines, including adjacent roads/pipelines.

<table>
<thead>
<tr>
<th>Species</th>
<th>Seeding Rate (pounds PLS/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Native perennial grasses</td>
<td></td>
</tr>
<tr>
<td>Bluebunch wheatgrass</td>
<td>6.0</td>
</tr>
<tr>
<td>Slender wheatgrass</td>
<td>4.0</td>
</tr>
<tr>
<td>Idaho fescue</td>
<td>5.0</td>
</tr>
<tr>
<td>Needle-and-thread</td>
<td>3.0</td>
</tr>
<tr>
<td>Subtotal</td>
<td>18</td>
</tr>
<tr>
<td>Native perennial forbs and shrubs</td>
<td></td>
</tr>
<tr>
<td>Arrowleaf balsamroot</td>
<td>4.0</td>
</tr>
<tr>
<td>Prairie sagewort</td>
<td>0.5</td>
</tr>
<tr>
<td>Subtotal</td>
<td>4.5</td>
</tr>
<tr>
<td>Total Seed</td>
<td>22.5</td>
</tr>
</tbody>
</table>

*PLS = pure live seed/acre
6. To limit grazing impacts until the plant community gets established, SMC would fence disturbed areas after reclamation and seeding. Implementation of the modified grazing systems may also help limit reinvasion of the undesirable species after fences are removed.

7. For pipelines and other linear disturbances in undisturbed areas, a minimum of the upper 12 inches of soil would be salvaged and set aside on one side of the trench. Subsoils and parent materials would be set on the other side of the trench. As soon as the pipeline or other linear disturbance is constructed, reclamation of the trench would begin. Parent materials and sub-soils would be compacted back into the trench first, followed by replacement of topsoil.

8. SMC would rip compacted surfaces after regrading is complete and before soil replacement. SMC would have rip gain (i.e. increased soil volume) after soil placement to minimize compaction. This ripping would enhance water and root penetration and minimize the potential for cover soils to slip off compacted surfaces on steep slopes. During Phase II of Interim Reclamation (see Plan of Operations page 66), those areas where soils have been compacted as a result of project implementation - including, but not limited to, construction laydown areas- would be ripped to approximately 6” depth or greater as necessary to address soil profile compaction. Where appropriate and feasible, ripping would occur in a direction transverse to primary driving paths so as to better blend remaining road mix surfacing into the soil profile. Where possible, imported surfacing materials would be removed; otherwise, surfacing is to be scattered across the laydown site to so as to minimize the potential for long-term linear corridor establishment.

9. To ensure that the reclamation bond accurately considers closure needs, after construction of the decline SMC would submit a final closure/reclamation plan to the USFS and MDEQ for review/approval. This plan should include specifications for closure, including backfilling the portal entrance, portal pad reclamation, portal access road reclamation, final revegetation, monitoring, and reclamation sequencing. In the event that water quantity/quality monitoring indicates that streams and springs are being adversely affected by decline transferring groundwater from the Little Rocky basin to the Stillwater River basin, the final closure/reclamation plan should also include specifications for mitigating such effects. Mitigations should include consideration of constructing an underground plug or other structure in the decline to prevent such water transfer. The reclamation bond would be adjusted accordingly upon USFS/MDEQ approval of the final closure/reclamation plan.

2.3.1.3 Proposed Action Alternative Noxious Weeds Mitigations

Based on the Northern Region Risk Protocol Rating for this project and direction found in Forest Service Manual (FSM) 2080, the Proposed Action Alternative would require the following change/modification/special mitigation:
1. SMC would monitor the analysis area for at least five consecutive years after final reclamation and control of newly discovered infestations on NFS lands would be provided.

2.3.1.4 Proposed Action Alternative Engineering Mitigations

To ensure compliance with Forest Service engineering standards and minimize/eliminate potential public safety concerns, the Proposed Action Alternative would require the following changes/modifications/special mitigations:

1. SMC would develop and implement a sign plan for review/approval by the Forest Service. This sign plan should address signing needs specific to exploration activities, operations, reclamation, and closure and would be implemented upon approval. Include signing to inform the public of shooting restrictions per 36 CFR 261.10 (d) regarding discharging a firearm or any other implement capable of taking human life, causing injury, or damaging property within 150 yards of buildings (including the water treatment facility, Portal pad buildings, and any other buildings) or across or on a National Forest System road (including Portal access road, water treatment plant access road, and LAD access Road #241418).

2. SMC would submit a road improvement plan for LAD access Road #241418 for USFS review/approval. Once approved, SMC would implement this plan.

3. SMC would submit an annual road use/construction/maintenance plan to the Forest Service for review/approval prior to the summer and fall use seasons describing road construction needs and maintenance activities. The plan would specify anticipated type, frequency, and duration of traffic on roads designated for public motorized use. The plan would include measures to mitigate potential safety concerns associated with these activities and may need to include construction of additional turnouts and clearing for driving safety or need to incorporate road closures or use of flaggers during haul times and during utility installation to reduce public traffic/mine traffic conflicts. The plan would identify needs for additional signing, blading, dust abatement, surface rock replacement and storm water management activities. Upon approval, SMC would be responsible for plan implementation.

4. Culverts would be installed at road approaches to new access roads.

5. Any road where utilities are cut into the road needs to be reconstructed so as to facilitate proper drainage of storm water runoff. Such roads should also have at least 6” of an approved crushed aggregate road mix placed on road.

2.3.1.5 Proposed Action Alternative Aquatic and Hydrologic Resources Mitigations

To ensure compliance with the State of Montana Yellowstone Cutthroat Trout Conservation Strategy, Clean Water Act, and Safe Drinking Water Act the Proposed Action Alternative would require the following changes/modifications/special mitigations:

1. To minimize effects of potential sediment generation to fish reproduction, instream work (including improvements to and power/water lines under the existing ford at road # 24141C) would be conducted from 7/15 to 9/30.
2. Stillwater Mining Company would secure required State and Federal permits prior to conducting ground-disturbing work in and near streams. Such permits could potentially include, but not be limited to:
   a) A joint 404/318/310 permit for instream work. The USFS would sign this permit as the landowner and SMC would sign this permit as the applicant.
   b) A Storm Water Pollution Prevention Plan (SWPP) for DEQ review/approval.

3. SMC would submit a water resources monitoring plan to the USFS and MDEQ for review/approval prior to initiating ground disturbing activities. This plan should include monitoring water quality and flow quantity of springs, seeps, and draws that could potentially be impacted by LAD irrigation and decline construction. The plan would include baseline, operational, and closure monitoring of Schwenneger Spring for nitrogen compounds and salinity. Upon approval, Stillwater Mining Company would be responsible for plan implementation and reporting.

4. Following construction of the Portal and when hauling of waste rock is completed on the Portal access road, storm water conveyance ditches and storm water ponds would be designed and re-constructed by SMC to accommodate at least a one in 25 year, 24 hour storm event as deemed necessary by the USFS and MDEQ.

5. Where rock is prescribed for lining ditches or conveyance channels, only rock with no soluble nitrogen compounds or trace mobile metals would be used.

6. Any drinking water system developed as a part of the Benbow Portal Project would need to be in compliance with State and Federal Safe Drinking Water Act regulations.

**2.3.1.6 Proposed Action Alternative Cultural Resources Mitigations**

To ensure compliance with the National Historic Preservation Act, the Archeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act, the Proposed Action Alternative would require the following changes/modifications/special mitigations:

1. If, in connection with operations under this decision, any unanticipated historic or prehistoric resources are encountered, activities must cease in the vicinity of the find and the District Ranger and Forest Archeologist notified. Plans designed to avoid or reduce further disturbance or to mitigate existing disturbance would be formulated in consultation with the MTSHPPO, affected tribes, and the Forest Service. The discovery must be protected until notified in writing to proceed by the authorized officer (see 36 CFR 800.100,112:43 CFR 10.4).

2. Monitoring of construction activities in the locations found to be of moderate to high probability for prehistoric site locations would be required and would be conducted by a qualified USFS archeologist. These areas include the LAD locations and the water pipeline and power line locations leading from Little Rocky Creek to the portal location.
3. Formal consultation with the MTSHPO by the USFS would be required for all ground disturbing activities and effects to historic properties prior to the final decision on this undertaking. Consultation could result in additional required mitigations.

2.4 AGENCY MITIGATED ALTERNATIVE (ALTERNATIVE 3)

The Agency Mitigated Alternative consists of Stillwater Mining Company’s Plan of Operations with water disposal using an Underground Injection Control (UIC) well and beneficial waste rock use. The Agency Mitigated Alternative project implementation schedule is the same as proposed for the Proposed Action Alternative. On December 9, 2014 Stillwater Mining Company provided a revised proposed construction schedule to replace the schedule originally included as Plan of Operations Appendix M. The revised schedule proposes surface facility construction (access road, portal pad, power lines, pipelines, and water treatment facilities) from September 2015 through spring 2016. Portal entrance and underground construction and beneficial waste rock use would begin in August 2016 and end in August 2019. Waste dump closure and surface facilities decommissioning would occur in fall 2019.

On March 6, 2015 SMC submitted a proposal to install a water well on the Benbow Portal Pad to supply water for development and exploration purposes (see project record). The well would be drilled at a 60 degree incline to 1,385 feet depth to allow water extraction from the Madison Limestone formation. The well would be installed immediately following construction of the portal pad, but prior to initiation of portal development and exploration activities, which is anticipated to be in March or April 2016. No additional surface disturbance is proposed based on this location. Once installed, if the water quality from the well meets drinking water standards, this well would also be used to supply an additional 20 gpm of potable water to portal pad facilities, bringing the total flow to approximately 100 gpm. The MDEQ Potable Water Section has an extensive suite of parameters including salts, metals, radiologic, volatile, and semivolatile organic compounds that must be analyzed prior to permitting a well as a potable supply. Assuming the proposed water well meets drinking water standards, the existing well near Little Rocky Creek would be closed and the proposed water and power line from the well to portal pad would not be necessary. The water supply well would be collared on the Portal Pad, drilled at a 60 degree incline, and permitted as a non-community water supply through MDEQ. This well proposal is included in this analysis as part of the proposed activities under Alternative 2.

A Forest Plan Amendment would be required as part of Alternative 3 to address a conflict between goshawk Management Indicator Species and Management Area goals. Refer to the Forest Plan consistency discussion in Section 2.7.4.

Figure 2.4 is a map detailing locations of specific items included in the Agency Mitigated Alternative.
NOT FOR CONSTRUCTION

Figure 2.4. Agency Mitigated Alternative Map.
The UIC well was drilled in 2014 and is being tested as approved under a separate January 13, 2014 NEPA decision (see project record for Stillwater Mining Company Plan of Operations – Benbow Exploration Portal - Environmental Characterization as amended). The Benbow UIC well is designed to inject water treated to meet drinking water standards. SMC submitted an application for Class V UIC well use to the EPA. EPA has determined that such use would be authorized by rule under the Safe Drinking Water Act (see project record). The UIC well was drilled to 3,440 foot depth and is screened to allow injection of water into the Madison Limestone formation from 2,660 to 3,280 feet. The December 2014 Well Completion and Aquifer Testing Report for Proposed Benbow Underground Injection Well provides a complete description of the injection well (see project record). Aquifer testing indicates that the well is capable of sustained operation at the required design injection rate of 300 gpm. A dye tracer test is currently underway to assess the potential fate of injected water. Results to date indicate that there is no potential for injected water discharging to nearby surface water bodies and domestic water wells. Stillwater Mining Company has indicated that additional monitoring through the winter of 2015 is needed before a final feasibility determination can be made. Monitoring results to date are included in the project record.

To reduce the size of the proposed lined waste rock facility, Stillwater Mining Company, in conjunction with the USFS and MDEQ, has developed a beneficial waste rock use plan. This would use waste rock generated from portal construction to surface roads, surface dispersed campsites, cap existing chromite tailings north of the Benbow mill site, and reconstruct the parking area at the Chrome Lake jeep trail trailhead. Specific beneficial waste rock locations and quantities are detailed in Table 2.7. For the beneficial use projects, waste rock would be placed during the summer months, which is more conducive to placement and compaction. Beneficial use projects that require waste rock storage or fill in excess of 15,000 cubic yards (cy) into a single location would be placed in compacted 5-foot lifts to minimize infiltration. At a minimum, waste rock containing nitrogen compounds would not be placed within 100 feet of any surface water resource or in areas of shallow groundwater (i.e. <15 feet in depth).
Table 2.7. Agency Mitigated Alternative beneficial waste rock use.

<table>
<thead>
<tr>
<th>Project description</th>
<th>Project type</th>
<th>Material placed volume estimate (cy)</th>
<th>Material type</th>
<th>Area of coverage¹ (ft &amp; acres)</th>
<th>Waste Rock Volume to be crushed² (cy)</th>
<th>Amount of Reject (cy)</th>
<th>One Way Haul Distance (approx.)</th>
<th>Number of Loads³ To place waste rock</th>
<th>Number of Loads³ to haul crushed reject material</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christian Ranch Rd. #24147</td>
<td>Rd. Surfacing</td>
<td>5,000</td>
<td>Crushed</td>
<td>17,857</td>
<td>8,333</td>
<td>3,333</td>
<td>2.3 mi.</td>
<td>500</td>
<td>333</td>
<td>From Rd. 2414 to Ranch</td>
</tr>
<tr>
<td>Christian Ranch</td>
<td>Crushed Stockpile</td>
<td>10,000</td>
<td>Crushed</td>
<td>na</td>
<td>16,667</td>
<td>6,667</td>
<td>3.0 mi.</td>
<td>1000</td>
<td>667</td>
<td></td>
</tr>
<tr>
<td>Stillwater County</td>
<td>Rd. Surfacing</td>
<td>10,000</td>
<td>Crushed</td>
<td>35,714</td>
<td>16,667</td>
<td>6,667</td>
<td>unknown</td>
<td>1000</td>
<td>667</td>
<td>Material to be hauled to predetermined stockpile</td>
</tr>
<tr>
<td>Historic Chrome Tails</td>
<td>Capping</td>
<td>60,000</td>
<td>Run of Mine</td>
<td>≈10 ac.</td>
<td>na</td>
<td>na</td>
<td>0.7 mi.</td>
<td>6000</td>
<td>na</td>
<td>Non-Nitrate Rock only</td>
</tr>
<tr>
<td>Delger Cabin Road (#24142)</td>
<td>Rd. Surfacing</td>
<td>1,200</td>
<td>Crushed</td>
<td>4,286</td>
<td>2,000</td>
<td>800</td>
<td>1.5 mi.</td>
<td>120</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Water Well Road (#24141)</td>
<td>Rd. Surfacing</td>
<td>500</td>
<td>Crushed</td>
<td>1,786</td>
<td>833</td>
<td>333</td>
<td>0.8 mi.</td>
<td>50</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>LAD Road (#241418)</td>
<td>Rd. Surfacing</td>
<td>1,350</td>
<td>Crushed</td>
<td>4,821</td>
<td>2,250</td>
<td>900</td>
<td>1.5 mi.</td>
<td>135</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Project description</td>
<td>Project type</td>
<td>Material placed estimate (cy)</td>
<td>Material type</td>
<td>Area of coverage (ft &amp; acres)</td>
<td>Waste Rock Volume to be crushed (cy)</td>
<td>Amount of Reject (cy)</td>
<td>One Way Haul Distance (approx.)</td>
<td>Number of Loads to place waste rock</td>
<td>Number of Loads to haul crushed reject material</td>
<td>Comments</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------</td>
<td>-------------------------------</td>
<td>---------------</td>
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<td>--------------------------------------</td>
<td>---------------------</td>
<td>-------------------------------</td>
<td>-------------------------------------</td>
<td>------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Benbow Road</td>
<td>Rd. Surfacing</td>
<td>13,500</td>
<td>Crushed</td>
<td>48,214</td>
<td>22,500</td>
<td>9,000</td>
<td>ave. 4.0 mi.</td>
<td>1350</td>
<td>900</td>
<td>From County Line to Benbow Mine Site</td>
</tr>
<tr>
<td>Chrome Lake Jeep Trail</td>
<td>Parking Area/Rd.</td>
<td>25,000</td>
<td>Run of Mine</td>
<td>≈2.5 ac.</td>
<td>na</td>
<td>na</td>
<td>2.3 mi.</td>
<td>2500</td>
<td>na</td>
<td></td>
</tr>
<tr>
<td>Rd. 241410</td>
<td>Rd. Surfacing</td>
<td>2,000</td>
<td>Crushed</td>
<td>7,143</td>
<td>3,333</td>
<td>1,333</td>
<td>2.0 mi.</td>
<td>200</td>
<td>133</td>
<td></td>
</tr>
<tr>
<td>Rd. 241411</td>
<td>Rd. Surfacing</td>
<td>350</td>
<td>Crushed</td>
<td>1,250</td>
<td>583</td>
<td>233</td>
<td>0.9 mi.</td>
<td>35</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Rd. 241412</td>
<td>Rd. Surfacing</td>
<td>100</td>
<td>Crushed</td>
<td>357</td>
<td>167</td>
<td>67</td>
<td>1.3 mi.</td>
<td>10</td>
<td>7</td>
<td>Non-nitrate bearing rock only within 100’ of streams.</td>
</tr>
<tr>
<td>Rd. 241413</td>
<td>Rd. Surfacing</td>
<td>100</td>
<td>Crushed</td>
<td>357</td>
<td>167</td>
<td>67</td>
<td>1.3 mi.</td>
<td>10</td>
<td>7</td>
<td>Non-nitrate bearing rock only within 100’ of streams.</td>
</tr>
<tr>
<td>Rd. 24148</td>
<td>Rd. Surfacing</td>
<td>1,100</td>
<td>Crushed</td>
<td>3,929</td>
<td>1,833</td>
<td>733</td>
<td>1.9 mi.</td>
<td>110</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>Rd. 24149</td>
<td>Rd. Surfacing</td>
<td>100</td>
<td>Crushed</td>
<td>357</td>
<td>167</td>
<td>67</td>
<td>1.3 mi.</td>
<td>10</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Rd. 24148A</td>
<td>Rd. Surfacing</td>
<td>100</td>
<td>Crushed</td>
<td>357</td>
<td>167</td>
<td>67</td>
<td>1.9 mi.</td>
<td>10</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Project description</td>
<td>Project type</td>
<td>Material placed volume estimate (cy)</td>
<td>Material type</td>
<td>Area of coverage(^1) (ft &amp; acres)</td>
<td>Waste Rock Volume to be crushed(^2) (cy)</td>
<td>Amount of Reject (cy)</td>
<td>One Way Haul Distance (approx.)</td>
<td>Number of Loads(^3) To place waste rock</td>
<td>Number of Loads(^3) to haul crushed reject material</td>
<td>Comments</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------</td>
<td>--------------------------------------</td>
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<td>--------------------------------------</td>
<td>------------------------------------------</td>
<td>----------------------</td>
<td>--------------------------------------</td>
<td>---------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Dispersed Campsites (3 ac.)</td>
<td>Surfacing</td>
<td>2,500</td>
<td>Crushed</td>
<td>≈3 ac.</td>
<td>4,167</td>
<td>1,667</td>
<td>unknown</td>
<td>250</td>
<td>167</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>133,000</td>
<td></td>
<td></td>
<td>80,000</td>
<td>32,000</td>
<td></td>
<td>13,300</td>
<td>3,200</td>
<td></td>
</tr>
</tbody>
</table>

\(^1\)Assumes 0.28 cy/ft coverage; 6'' depth  
\(^2\)Assumes 40% material reject  
\(^3\)Assumes 10 cy/load  
\(^4\)na = not applicable
SMC has indicated that they are considering use of a “road-header” to cut through the sedimentary rock portions of the decline. Igneous rock in the area is likely too hard for road-header use. If a road-header is utilized in the sedimentary rock, approximately 21 percent of waste rock generated would not contain explosive residue nitrogen compounds and could be beneficially used in proximity to ground and surface waters. If the road header is not used, beneficial waste rock would not be placed in some areas as detailed in the numbered list of beneficial waste rock specifications below. Beneficial waste rock use would include the following specifications to be implemented by SMC:

1. Beneficial waste rock use would be conducted so as to ensure waste rock from rock units with potential to leach metals is handled and placed so as to prevent leachate in excess of State water quality standards from entering surface or groundwater resources. Rock formations with such potential include the Amsden, Wolsey, Park, and Bakken formations, which comprise approximately 2.8 percent of the total waste rock volume as detailed in the December 17, 2014 Benbow Decline Environmental Geochemistry Review (Enviromin 2014).

2. To provide a larger parking area for public recreation use, waste rock would be placed to fill in the gully adjacent to the current Chrome Lake jeep trail #2415 trailhead (Knight Piesold 2015). The parking area would be designed to accommodate parking and turnaround areas for an RV/trailer combination. The parking area would be constructed to maintain storm water drainage and the nearby culvert under Road #2414 would be replaced to accommodate modeled storm runoff from the parking area and adjacent slopes. The sides of fill slopes not used for parking would be capped with a minimum of 12” topsoil salvaged from onsite and revegetated.

3. Reroute the existing short section of Chrome Lake jeep trail #2415 from the intersection with Benbow Rd. #2414 to Chrome Lake jeep trail trailhead to a lower grade, add drainage and surfacing.

4. Redesign and reconstruct the existing intersection of the Benbow Rd #2414 and Chrome Lake jeep trail #2415 to a standard 90 degree intersection. Ensure size/angle will accommodate turn radius for RV/trailer combination. Add proper sized culvert to allow ditch to drain under the junction.

5. Only non-nitrogen compound bearing waste rock would be placed where roads or dispersed campsites are within 100 feet of surface water features, including roads #2414, #241411 and #241412.

6. Approved portions of the Benbow mill site historic tailings area would be capped with non-nitrogen compound bearing waste rock, followed by a minimum 12” topsoil or other USFS/MDEQ approved growth medium, then revegetated.

7. The stream bank at the Benbow mill site historic tailings area which is currently composed of tailings would be stabilized, capped, and re-vegetated. Stillwater Mining Company would submit a specific design and plan for USFS/MDEQ approval prior to implementing stabilization actions.

8. Run-of-mine waste rock for beneficial use would initially be placed at the chrome tailings area and Chrome Lake Jeep Trail trailhead. Once the tailings are capped and the trailhead footprint enlarged, a gravel crushing plant would be used at the western side of
the historic chrome tailings area (further from the existing stream channel) to create material suitable for road and parking area surfacing. Waste rock would be crushed at this location and gravel would be temporarily stockpiled there. Fine-grained reject material from the crushing operation would be backhauled for disposal at the lined waste rock facility.

9. Hauling on the Benbow Road #2414 would be accomplished using highway legal dump trucks. Beneficial waste rock hauling and gravel placement would occur only on weekdays.

2.4.1 Agency Mitigated Action Alternative Mitigation Measures
In addition, the Agency Mitigated Action Alternative would include mitigation measures determined to be necessary to ensure compliance with applicable law/regulation/policy as detailed below. Mitigation measures are listed by resource area as they apply to the Agency Mitigated Alternative.

2.4.1.1 Agency Mitigated Alternative Scenery Resources Mitigations
To reduce impacts to scenery resources, the Agency Mitigated Alternative would require the following changes/modifications/special mitigations:

1. SMC would create undulations in the final surface of the waste rock storage area, at whichever stage it reaches. SMC would aim to create at least 2 crowned areas that are approximately 10 to 15 feet different in height so that the undulation is discernible at a distance (while facilitating storm water drainage from the waste rock storage area and minimizing percolation into the waste rock pile).

2. In consultation with the USFS, and dependent upon the final waste rock construction build-out, SMC could remove up to sixty of the larger trees that are within 100 feet of the uphill side of the proposed road where it passes just uphill from the waste rock storage area. The intent would be to create small openings and a clumped pattern just above the road, to break up that strong horizontal line. Removed trees would be decked and disposed of as specified for other trees in the Plan of Operations.

3. If shotcrete or other means to retain the cut-slopes is used along the full-bench road or back cut-slope wall of the portal pad, the method and coloring of material would be subject to USFS review and approval. The aim would be to reduce the visual dominance of the color of the cut-slope and to break up the continuity of that horizontal line.

4. SMC would develop and submit for USFS approval a forest health monitoring plan for periodically assessing the health of the trees and establishing protocols in the event that pathologies start that could kill more than half of the existing live trees within 150 feet of infrastructure, including the portal pad access road, the water treatment facility at the toe of the waste rock storage area, and the portal pad fill slope. If such mortality is reasonably foreseeable, SMC would develop a mitigation plan for USFS approval. Upon approval, SMC would implement the mitigation plan.

5. To minimize the effect of buildings to scenery resources, SMC would:
a) Minimize sun reflectance by not having any windows that face to the east/northeast. If this is not possible, they would provide visual screening of such windows.

b) Ensure roofs are peaked and that the peaks and long dimension of buildings are oriented east-west for buildings that will remain onsite for greater than 5 years.

c) Submit exterior building and facility colors for Forest Service review/approval, with the aim towards reducing their visibility while breaking up the visual dominance of the back cut slope.

d) Locate onsite buildings and support facilities on the portal pad as far to the west side of the pad surface and away from the east edge as possible.

e) (While staying in conformance with MSHA/OSHA requirements) ensure that any security lights are:
   i. motion activated (so not constantly visible) where practicable,
   ii. as dim and small / low as possible (while still providing needed function) and
   iii. angled away from the key observation point (i.e. angled toward the west). The key observation point is the junction of Roads #2414 and #24142 (i.e. Benbow Road turn-off to Beartooth Christian Ranch).

6. To reduce the visual dominance of propane tanks on the Portal pad, their front halves that face east/northeast would be painted a color similar to the buildings.

2.4.1.2 Agency Mitigated Alternative Recreation Resources Mitigations

To ensure compliance with the Custer Forest Plan and reduce effects to recreation resources, the Agency Mitigated Alternative would require the following changes/modifications/special mitigations:

1. In consultation with the Forest Service, add signing at the Chrome Lake Jeep trail trailhead to inform users of the recreation opportunities as well as regulations/restrictions concerning mineral operations in the area.

2. To mitigate noise from generators, generators used at the portal pad would be required to have functional mufflers and be housed in noise attenuation enclosures.

3. The Forest Service would use news releases and field level contacts to inform and educate the public regarding exploration operations or restrictions to raise public awareness.

2.4.1.3 Agency Mitigated Alternative Wildlife Resources Mitigations

To reduce potential for bear encounters that could result in human safety concerns or wildlife impacts, the Agency Mitigated Alternative would require the following changes/modifications/special mitigation:

1. Any grizzly bear or black bear observation by project personnel would be reported to the Forest Service minerals administrator within 48 hours. It is understood that the Forest
Service may require immediate temporary modification of operations if such an action is deemed necessary in order to prevent confrontation or conflict between humans and bears.

### 2.4.1.4 Agency Mitigated Alternative Wildland Fire Mitigations

To reduce potential for damage to onsite buildings by future wildland fire, the Agency Mitigated Alternative would require the following changes/modifications/special mitigation:

1. To reduce and remove vegetation around onsite buildings, SMC would apply Montana DNRC’s 1993 *Fire Protection Guidelines for Wildland Residential Interface Development* around buildings at the portal pad and the water treatment facilities at the toe of the waste rock storage area. In sloped areas, distances would be increased as described in guidelines Appendices A-D. This would include the following specifications based on horizontal distances as illustrated in Figure 2.4:

   a) Within 3 feet around buildings, maintain an area of non-combustible material - concrete, gravel, mineral soil, etc.

   b) From 3 to 10 feet around buildings, remove all trees and downed woody fuels.

   c) From 10 to 20 feet around buildings, thin trees to 10 feet between crowns. Prune limbs of all remaining trees to 15 feet or one-third the total live crown height, whichever is less. Maintain surface vegetation at 3 inches or less. Remove all downed woody fuels.

   d) From 20 to 100 feet around buildings, thin trees to 10 feet between crowns. Prune limbs of all remaining trees to 15 feet or one-third the total live crown height, whichever is less. Remove all downed woody fuels more than 3 inches in diameter.

2. Vegetation removed for wildland fire mitigation would be disposed of as detailed in the Plan of Operations, page 20.
2.4.1.5 Agency Mitigated Alternative Reclamation and Noxious Weeds Mitigations

To ensure that reclamation occurs in compliance with 36 CFR 228a, Montana Code Annotated Title 82 Chapter 4 Part 3, the Custer Forest Plan, Forest Service Noxious Weeds policy, and the 2006 Custer National Forest Weed EIS, and direction found in Forest Service Manual (FSM) 2080, the Agency Mitigated Action Alternative would require the following changes/modifications/special mitigations:

1. Prior to initiating ground-disturbing activities, Stillwater Mining Company would develop and submit for USFS/MDEQ approval a project-specific noxious weed monitoring and treatment plan for the Benbow area that includes the following:

   a) Type, scope, timing and frequency of noxious weed infestation monitoring and treatment in and near Benbow Exploration Portal and Support Facilities Plan of Operations activity areas and existing noxious weed infestations adjacent to these areas, both during exploration operations and after reclamation and closure.

   b) Noxious weed treatment should occur about one month before ground-disturbing exploration activities occur if during the growing season. If ground-disturbing activities would occur outside of the growing season, then weed treatment would occur during the previous growing season.
c) Applicable standard noxious weed best management objectives and associated practices for roads, minerals, and stockpile management that would be followed to reduce noxious weed spread (See Northern Region Policy (Forest Service Manual 2080) and decisions made in the 2006 Custer National Forest Weed EIS (EIS Appendix C - protective measures and Appendix D - project design criteria)).

2. Stillwater Mining Company would remove weed sources that could be picked up by passing vehicles or operating equipment and limit seed/vegetation transport in areas disturbed by exploration and reclamation activities by:
   a) Removing all mud, dirt, and plant parts from all off road equipment before moving into project area. Cleaning must occur off National Forest lands. Such equipment would be inspected by or in coordination with the USFS Minerals Administrator. This does not apply to service vehicles that would stay on the roadway, traveling frequently in and out of the project area.
   b) If operations occur in areas infested with new noxious weed invaders as determined by the Forest/District Weed Specialist in conjunction with the USFS Minerals Administrator, all equipment would be cleaned prior to leaving the project site. Such cleaning would require appropriate containment and disposal of water and any potentially seed containing mud or debris. Specific means for such cleaning in response to new noxious weed invaders would be developed in conjunction with the USFS Minerals Administrator.

3. Stillwater Mining Company would reestablish vegetation in areas cleared of vegetation by exploration and reclamation activity to minimize weed spread by implementing revegetation measures in the Plan of Operations and the following measures:
   a) Ensure all seed mixes utilized are certified noxious weed free.
   b) Stillwater Mining Company would maintain stockpiled material (gravel, topsoil, etc.) and areas disturbed by project activities in a noxious weed-free condition.
   c) Revegetate all disturbed soil, except the travel way on surfaced roads, as soon as possible and in a manner that optimizes plant establishment for that specific site, unless ongoing disturbance at the site would prevent weed establishment.

4. Stillwater Mining Company would minimize the movement of existing and new noxious weed species caused by moving infested gravel and fill material by:
   a) Not using gravel sources if new noxious weed invaders, defined by the Forest Weed Specialist, are present.
   b) Checking the area where gravel pit materials are used to ensure that no noxious weed seeds are transported to the use site.

5. Stillwater Mining Company would minimize roadside sources of noxious weed seed that could be transported to other areas during maintenance by:
   a) Looking for priority noxious weed species during road maintenance and report back to USFS Minerals Administrator.
b) Not blading roads or pulling ditches where new noxious weed invaders are found as determined by the Forest/District Weed Specialist in conjunction with the USFS Minerals Administrator.

6. Stillwater Mining Company would reduce noxious weed establishment for final site reclamation by treating weeds in road obliteration and reclamation projects before roads are made undrivable by reclamation measures.

7. Prior to use of any areas subjected to repetitive concentrated use, including laydown areas, slash pile stockpiling and burning areas within laydowns, and roads, Stillwater Mining Company would strip and stockpile topsoil for use in later reclamation. Laydown area topsoil would be stripped only on vehicle travel locations or other locations where soil compaction/displacement from equipment operations or slash pile burning could occur. Gravel or rock road surfacing would be placed on vehicle travel routes within laydown areas. The topsoil piles would be located to act as erosion control berms to control runoff from the disturbed areas. Stillwater Mining Company would seed the topsoil stockpiles with the agency approved certified noxious weed free mid-grass dominant native seed mix and monitor and treat topsoil stockpiles and laydown areas for noxious weeds during operations.

8. After use is completed in areas subjected to repeated concentrated equipment use, including travel ways and slash pile burn areas within laydown areas, SMC would scatter and remove the majority of placed surfacing. Removed surfacing would be used for road maintenance actions on USFS roads in the area. Compacted areas would be ripped or otherwise loosened. After the compaction is loosened, SMC would evenly spread stockpiled topsoil across the areas and seed them with the agency approved certified noxious weed free native seed mix approved for that area.

9. Following reclamation of larger areas of ground disturbance (laydown areas, topsoil stockpile area, underground injection control well pad, and portal pad) Stillwater Mining Company would install fence around these areas to prevent livestock grazing damage to the newly seeded area. Once the USFS and MDEQ deem reclamation successful as described in the Plan of Operations, SMC would remove fences. Native seed mixes usually take 3-5 years to reestablish vegetation to match pre-disturbance production levels.

10. SMC would monitor reclaimed areas for a period of five years following reclamation. SMC would monitor and evaluate success of revegetation in relation to Reclamation Bond Release measures in the Plan of Operations and per these mitigations and report to the USFS and MDEQ annually until revegetation is deemed successful by the USFS and MDEQ. Revegetation would be deemed successful when monitoring indicates 1) Species composition is similar to or on a growth trajectory towards that of adjacent areas and 2) Vegetation canopy cover is similar to (75% of or greater) the existing percent vegetation canopy cover of adjacent areas not disturbed by operations authorized by this Plan. In the event that the USFS/MDEQ determines that revegetation is not successful or noxious weeds warrant treatment, SMC would complete additional reclamation and/or treatments as directed by the USFS/MDEQ.

11. To comply with Management Area B forested vegetation goals, SMC would use slightly different certified noxious weed free seed mixes and include some woody species.
planting for the major plant communities located in the forested disturbance areas as listed in Table 2.4. Reducing the amount of native perennial grass seed by half, seeding appropriate forb species, and including some native shrub and tree planting may decrease the amount of time needed to replace the Douglas-fir/mallow ninebark plant communities.

12. To comply with Management Area B vegetation goals in shrubby cinquefoil/Idaho fescue plant community areas, SMC would attempt to improve native perennial midgrass species abundance on sites currently dominated by less desirable non-native species as much as possible by using certified noxious weed free seed in the Table 2.5 seed mix. The heavy seeding of the desirable native midgrasses may reduce the potential reinvasion of timothy and establishment of Kentucky bluegrass and cheatgrass in the disturbed and reclaimed plant community.

13. For pipelines and other linear disturbances in undisturbed areas, at minimum, the upper 12 inches of soil would be salvaged and set aside on one side of the trench. Subsoils and parent materials would be set on the other side of the trench. As soon as the pipeline or other linear disturbance is constructed, reclamation of the trench would begin. Parent materials and subsoils would be compacted back into the trench first followed by replacement of topsoil.

14. SMC would rip compacted surfaces after regrading is complete and before soil replacement. SMC would have rip gain (i.e. increased soil volume) after soil placement to minimize compaction. This ripping would enhance water and root penetration and minimize the potential for cover soils to slip off compacted surfaces on steep slopes. During Phase II of Interim Reclamation (see pg. 66 of Benbow Portal Plan of Operations), those areas where soils have been compacted as a result of project implementation- including, but not limited to, construction laydown areas- would be ripped to approximately 6” depth or greater as necessary to address soil profile compaction. Where appropriate and feasible, ripping would occur in a direction transverse to primary driving paths so as to better blend mix surfacing into the soil profile. Where possible, imported surfacing materials would be removed; otherwise, surfacing is to be scattered across the laydown site to so as to minimize the potential for long-term linear corridor establishment.

15. SMC would salvage soil along major access corridors on native soils in the laydown areas. The access corridors would have to be graveled during operations. At closure, SMC would be required to remove the gravel and rip the compacted surface before the stored soil is replaced. This practice would limit heavy equipment traffic impacts to vegetated soils along the access corridors.

16. Where practicable, stockpiled topsoil would be mixed prior to reapplication.

17. All applicable storm water BMPs would be implemented during project activities and during initial phases of reclamation to prevent soil losses. These include, but would not be limited to, silt fences, slash filter windrows, straw wattles, and erosion mats.

18. Topsoil stockpiles would be seeded using the revised seed mixes (see Reclamation and Noxious Weeds Mitigations 4 and 5) when first favorable re-seeding conditions exist after being piled.
19. To reduce impacts to the Idaho fescue/bluegrass habitat type, SMC and the USFS/MDEQ would conduct a field review of the proposed LAD laydown area boundary and try to modify the boundary and limit impacts to plant communities dominated by native midgrasses. The LAD laydown area is proposed along the boundary of the habitat type dominated by native midgrasses and the shrubby cinquefoil/timothy habitat type. The Agencies are confident that the proposed rectangular laydown area can be modified to either reduce the overall laydown area size or change the shape to avoid some portions of the native midgrass dominated areas. This could reduce construction impacts to the grassland in high-seral condition.

20. To ensure that the reclamation bond accurately considers closure needs, after construction of the decline SMC would submit a final closure/reclamation plan to the USFS and MDEQ for review/approval. This plan should include specifications for closure, including backfilling the portal entrance, portal pad reclamation, portal access road reclamation, final revegetation, monitoring, and reclamation sequencing. In the event that water quantity/quality monitoring indicates that streams and springs are being adversely affected by decline transferring groundwater from the Little Rocky basin to the Stillwater River basin, the final closure/reclamation plan should also include specifications for mitigating such effects. Mitigations should include consideration of constructing an underground plug or other structure in the decline to prevent such water transfer. The reclamation bond would be adjusted accordingly upon USFS/MDEQ approval of the final closure/reclamation plan.

2.4.1.6 Agency Mitigated Alternative Engineering Mitigations

To ensure compliance with Forest Service engineering standards and minimize/eliminate potential public safety concerns, the Agency Mitigated Alternative would require the following changes/modifications/special mitigations:

1. SMC would make new road intersections at or as close as possible to 90°.
2. SMC would eliminate the double access “Y” junction to Road #2414 from the water treatment facility access road and construct only one junction with Road #2414 at this location.
3. SMC would install culverts at road approaches to new access roads.
4. Any road where utilities are cut into the road would be reconstructed by SMC so as to facilitate proper storm water drainage. Such roads would also have at least 6” of an approved crushed aggregate road mix placed on road.
5. SMC would surface existing Forest Service roads to be used for mineral exploration activities with at least 6” of an approved crushed aggregate road mix.
6. SMC would develop a sign plan for review/approval by the Forest Service. This sign plan should address signing needs specific to exploration activities, operations, reclamation, and closure and would be implemented upon approval. Include signing to inform the public of shooting restrictions per 36 CFR 261.10 (d) regarding discharging a firearm or any other implement capable of taking human life, causing injury, or damaging property within 150 yards of buildings (including the water treatment facility, portal pad buildings, and any other buildings) or across or on a National Forest System road.
7. SMC would submit an annual road use/construction/maintenance plan to the Forest Service for review/approval prior to the summer and fall use seasons describing road construction needs and maintenance activities. The plan would specify anticipated type, frequency, and duration of traffic on roads designated for public motorized use. The plan would include measures to mitigate potential safety concerns associated with these activities and may need to include construction of additional turnouts and clearing for driving safety or need to incorporate road closures or use of flaggers during haul times and during utility installation to reduce public traffic/mine traffic conflicts. The plan would identify needs for additional signing, blading, dust abatement, surface rock replacement and storm water management activities. Upon approval, SMC would be responsible for plan implementation.

2.4.1.7 Agency Mitigated Alternative Aquatic and Hydrologic Resources Mitigations

To ensure compliance with the State of Montana Yellowstone Cutthroat Trout Conservation Strategy, Clean Water Act, and Safe Drinking Water Act the Agency Mitigated Alternative would require the following changes/modifications/special mitigations:

1. To minimize effects of potential sediment generation to fish reproduction, instream work (including improvements to and power/water lines under the existing ford at road #24141C and bank stabilization activities near the existing chromite tailings) would be conducted from 7/15 to 9/30.

2. SMC would secure required State and Federal permits prior to conducting ground-disturbing work in and near streams. Such permits could potentially include:
   a) A joint 404/318/310 permit for instream work. The USFS would sign this permit as the landowner and SMC would sign this permit as the applicant.
   b) A Storm Water Pollution Prevention Plan (SWPP) for MDEQ review/approval.

3. SMC would submit a water resources monitoring plan to the USFS and MDEQ for review/approval prior to initiating ground disturbing activities. This plan should include monitoring water quality and flow quantity of springs, seeps, and draws that could potentially be impacted by UIC use and decline construction. The plan would include baseline, operational, and closure monitoring for nitrogen compounds. Upon approval, Stillwater Mining Company would be responsible for plan implementation and reporting.

4. SMC would submit a pipeline monitoring and spill mitigation plan to the Forest Service and Montana DEQ for review/approval prior to initiating ground disturbing activities. Upon approval, Stillwater Mining Company would be responsible for plan implementation.

5. SMC would submit a hazardous substances handling, spill containment, cleanup, and reporting plan to the Forest Service and Montana DEQ for review/approval prior to bringing such substances to the project area. This plan would be based on standard operating procedures employed at the Stillwater Mine. Upon approval, Stillwater Mining Company would be responsible for plan implementation.

6. Following construction of the Portal and when hauling of waste rock is completed on the
Portal access road, storm water conveyance ditches and storm water ponds would be designed and re-constructed by SMC to accommodate at least a one in 25 year, 24 hour storm event as deemed necessary by the Forest Service and Montana DEQ.

7. Where rock is prescribed for lining ditches or conveyance channels, only rock with no soluble nitrogen compounds or trace mobile metals would be used.

8. Any drinking water system developed as a part of the Benbow Portal Project would need to be in compliance with State and Federal Safe Drinking Water Act regulations.

2.4.1.8 **Agency Mitigated Alternative Sensitive Plants Mitigations**

Additional waste rock placement areas were proposed as part of the project subsequent to the completion of surveys for sensitive plants. To ensure compliance with the Forest Service policy, the Custer Forest and the National Forest Management Act, the Agency Mitigated Alternative would require the following changes/modifications/special mitigations:

1. A portion of beneficial waste rock placement areas are considered to have potential for rare plants and would be surveyed prior to project implementation in these areas. In the event that any sensitive plants are found during these surveys, mitigation measures would be put in place to ensure maintenance of population viability as required by applicable Forest Service policy.

2.4.1.9 **Agency Mitigated Alternative Cultural Resources Mitigations**

To ensure compliance with the National Historic Preservation Act, the Archeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, the Agency Mitigated Alternative would require the following changes/modifications/special mitigations:

1. If, in connection with operations under this decision, any unanticipated historic or prehistoric resources are encountered, activities must cease in the vicinity of the find and the District Ranger and Forest Archeologist notified. Plans designed to avoid or reduce further disturbance or to mitigate existing disturbance would be formulated in consultation with the MTSHPO, affected tribes, and the Forest Service. The discovery must be protected until notified in writing to proceed by the authorized officer (see 36 CFR 800.100,112; 43 CFR 10.4).

2. Monitoring of construction activities in the locations found to be of moderate to high probability for prehistoric site locations would be required and would be conducted by a qualified USFS archeologist. These areas include the LAD locations and the water pipeline and power line locations leading from Little Rocky Creek to the portal location.

3. Formal consultation with the MTSHPO by the USFS would be required for all ground disturbing activities and effects to historic properties prior to the final decision on this undertaking. Consultation could result in additional required mitigations.

2.5 **OTHER ALTERNATIVES NOT STUDIED IN DETAIL**

As detailed in the Plan of Operations, SMC considered a number of different alternatives for
locating the Portal and for the management of treated development water. In addition, MDEQ and USFS worked with SMC to evaluate power supply alternatives.

2.5.1 Water management alternatives
As detailed in the Plan of Operations, SMC tested and considered various water management options. This work was completed under the approved Stillwater Mining Company Plan of Operations – Benbow Exploration Portal - Environmental Characterization as amended. Options tested and considered are as follows:

2.5.1.1 Option 1- Infiltration Gallery – Benbow Mill Area
The first option considered was the infiltration of treated mine water in an open, grassy area near the historic Benbow Mill Area. The infiltration gallery would have been similar to a septic drainfield with buried drainage laterals. Based on soils and percolation testing in that area, SMC determined that the clay and shale units would be too tight to support an infiltration gallery.

2.5.1.2 Option 2- Infiltration Gallery – Benbow Bench
Based on the results from Option 1, the next option SMC considered was to locate an infiltration gallery within the Judith River Sandstone Unit. It was believed that the sandstone would provide a better conduit for the infiltration of treated water. Based on geologic mapping, SMC was aware of the Judith River Sandstone on the northern half of the Prairie Creek Bench. Additional soils characterization and percolation testing was conducted. Similar to Option 1, SMC deemed the soils in the area would be too tight to support an infiltration gallery.

2.5.1.3 Option 3- Percolation Ponds – Benbow Bench
Option 3 considered the placement of percolation ponds on the Benbow Bench in the same area considered under Option 2. SMC believed that percolation ponds with significant side-perk capacity and the “head” to force water into the surrounding soils would be successful. The ponds would also allow for some evaporation. Additional test pits were completed, including large scale percolation tests. Based on the results of the testing and associated modeling, SMC recognized that due to the shallow depth of overburden, water from the percolation ponds would begin to mound at the interface between the overburden and bedrock. In turn, this could lead to possible lateral surface discharge of percolated water to the Prairie Dog Creek drainage, which SMC deemed unacceptable due to associated environmental and permitting concerns.

2.5.1.4 Option 4 - Hertzler Pipeline
Option 4 considered the installation of a buried pipeline from the Benbow Water Treatment Facilities to the Hertzler LAD Pond. In mapping a proposed route, SMC recognized that a number of private land-owners would be involved and easements required for an over four mile pipeline. Additionally, there would be considerable disturbance to bury the pipeline below frost level, along with the necessary inspection vaults and access routes. Most importantly, it was recognized that a number of surface water resources would have to be crossed including Prairie Dog Creek, Prairie Creek, and the Stillwater River. The pipeline would also be located and parallel Little Rocky Creek for a number of miles. There were also considerable questions and concerns about routing the pipeline through the town of Nye. Additionally, use of the Hertzler
LAD Pond Capacity by Benbow Operations would necessitate the percolation of equivalent volumes of water at the Stillwater Mine. SMC’s preference is to land-apply and beneficially use treated mine water rather than percolate to ground water. Based on these considerations and management of risk including the amount of disturbance; proximity to surface water resources; river/creek crossings; the impact to adjacent landowners; and, the short project duration, this option was dismissed by SMC in favor of a Benbow LAD Option or UIC option.

2.5.1.5 Option 5 - Land Application – Private Land

For Option 5, SMC evaluated the placement of a LAD Pond and Pivot Facilities on Private Land. SMC does not own any significant private land holdings near the proposed Benbow Portal site. Accordingly, a LAD location would have to be leased or purchased. SMC gave consideration to placement of a LAD Facility on the Beartooth Mountain Christian Ranch. Unfortunately, the identified LAD Pond area was too small (<3 acres) and was directly upgradient of neighboring domestic wells. The amount of acreage for land application was also too small.

SMC also evaluated other water management areas further downgradient. However, SMC realized there would be additional disturbances associated with power conduits, water pipelines, access roads, and monitoring. The LAD Pond and Pivots would remain the same with either Option 5 or the Proposed Action. However, in Option 5, the facilities would likely be located immediately adjacent to private homes, highways, and roads. Additionally, given the short duration of this project, SMC had concerns regarding the ability to acquire private land to support land application as well as SMC’s control over those land application facilities. In general, SMC felt that potential conflicts may arise with a landowner given SMC’s overly conservative LAD operating philosophy. Finally, SMC recognized that the LAD Facilities including pipeline routes, ponds, and pivot facilities would be in the proximity of Little Rocky Creek and/or Prairie Dog Creek, whereas, the Proposed Action water management presents an opportunity to site these facilities a significant distance from any surface water resource.

2.5.2 Portal Pad location alternatives

As indicated in the Plan of Operations, SMC’s criteria for locating the Portal Pad was to minimize visual impacts while maintaining the necessary safety requirements, engineering criteria, and approximate geological location to not only facilitate exploration activities but also allow for long-term ventilation exhaust and secondary egress. Other considerations included land ownership; proximity to surface water resources and flow direction; waste rock storage areas; accessibility from Benbow Road # 2414; and rock characteristics.

SMC considered four locations for the portal pad and exploration decline (Figure 2.5). In all cases, these locations were accessible (i.e. close to the Benbow Road) and were in the location that would allow SMC the necessary geological evaluation while meeting SMC’s required engineering criteria (Table 2.8).
Table 2.8. Portal location alternatives evaluation.

<table>
<thead>
<tr>
<th>Portal Pad Location – SMC Evaluation Criteria</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
<th>Alternative 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Pad Construction</td>
<td>Poor – Very Steep</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Poor – Adjacent to Good</td>
<td>Very Good</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Visual Impacts</td>
<td>Very Good</td>
<td>Good</td>
<td>Very Poor</td>
<td>Very Good</td>
</tr>
<tr>
<td>Land Ownership</td>
<td>USFS</td>
<td>USFS</td>
<td>USFS</td>
<td>USFS</td>
</tr>
<tr>
<td>Surface Water Resources</td>
<td>Very Poor – Proximity to Little Rocky Creek</td>
<td>Very Good</td>
<td>Very Poor – Proximity to Little Rocky Creek</td>
<td>Poor – within drainage</td>
</tr>
<tr>
<td>Waste Rock Volume</td>
<td>Same Base Case</td>
<td>Same Base Case</td>
<td>Longer Development</td>
<td>Longer Development</td>
</tr>
<tr>
<td>Public Safety*</td>
<td>Good</td>
<td>Good</td>
<td>Very Poor</td>
<td>Poor</td>
</tr>
<tr>
<td>Cultural Resources</td>
<td>Good</td>
<td>Good</td>
<td>Very Poor</td>
<td>Good</td>
</tr>
</tbody>
</table>

*How accessible is the site to the public.

Based on Table 2.8 criteria, SMC selected the Alternative 2 location as the preferred Benbow Portal Pad Location and engineered the proposed design based on those site conditions.
2.5.3 Power supply alternatives
Due to concerns with increased fuel delivery traffic and storage of fuel quantities for generators, MDEQ and the USFS asked SMC to evaluate routing new underground electric lines to the proposed Portal location from the existing Northwest Energy powerline to the north of the Benbow area. According to SMC, excess adequate power for the Benbow Portal project is not currently available from the nearby Northwest Energy 50,000 volt amps (50 kVa) line. Using 3 kVa off the existing line at Benbow would result in reduced available power at the Stillwater mine site which would not be realistic for SMC. Northwest Energy and Beartooth Electric Cooperative are expected to complete a new 100 kVa line plus the 50 kVa line coming into the Stillwater River valley. SMC indicated that because they Northwest Energy is planning to install a new 100 kVa line substation near the mine site, it makes more sense to support the Blitz project long-term (25+ years) running power from the Stillwater Mine east-side portal and into mine workings toward the Benbow decline. SMC therefore chose to propose use of a short-term (3-5 year) power supply for the Benbow Portal project via generators.

2.6 PROJECTS CONSIDERED FOR CUMULATIVE EFFECTS
CEQ and Forest Service regulation and guidance (40 CFR 1500 and 36 CFR 220) require consideration of the aggregate effects of the alternatives and other past, present, and reasonably foreseeable future actions. Cumulative effects result from incremental effects of actions, when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively considerable, actions taking place over a period of time. A cumulative effects analysis area can vary between issues / resource, and may encompass a larger area than the project area. Cumulative effects are discussed by issue area in Chapter 3. Table 2.9 summarizes past, present, and reasonably foreseeable activities generally considered in the various effects analyses.

Table 2.9. Past, present, or reasonably foreseeable future actions for consideration in cumulative effects assessment for the Stillwater Mining Company’s Blitz Ridge - 2014 Surface Exploration Drilling Plan of Operations.

<table>
<thead>
<tr>
<th>Past, present, or reasonably foreseeable future actions</th>
<th>On NFS Lands (Yes/No)</th>
<th>Estimated Period of Activity (Calendar Year)</th>
<th>Past, Present, or Reasonably Forseeable Future Actions (RF)</th>
<th>Within Project Area</th>
<th>Within Ranger District Boundary</th>
<th>Project Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stillwater Mining Company – Nye Mine operations</td>
<td>Yes</td>
<td>1985 to present</td>
<td>Past, Present, RF</td>
<td>Yes</td>
<td>Yes</td>
<td>Ongoing platinum and palladium mining at Nye Mine site and other mine-related facilities on private lands in Stillwater Valley. As of late 2013, within the 2416.6 acre permit area, approximately 1039.7 acres of disturbance was permitted, 789.3 acres of</td>
</tr>
<tr>
<td>Past, present, or reasonably foreseeable future actions</td>
<td>On NFS Lands (Yes/No)</td>
<td>Estimated Period of Activity (Calendar Year)</td>
<td>Past, Present, or Reasonably Foreseeable Future Actions (RF)</td>
<td>Within Project Area</td>
<td>Within Ranger District Boundary</td>
<td>Project Description</td>
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</tr>
<tr>
<td>Stillwater Mining Company Blitz Ridge - 2014 Surface Exploration Drilling Plan of Operations for Mineral Exploration</td>
<td>Yes</td>
<td>2015</td>
<td>Past, Present</td>
<td>Yes</td>
<td>Yes</td>
<td>Helicopter supported exploratory drilling at 8 sites in the Benbow and Nye Basin area. Approved drilling occurred at four of these sites from July to November 2014. To meet required road maintenance obligations, SMC bladed portions of Benbow Road 2414 and re-shaped water bars during summer 2014. Additional helicopter supported exploratory drilling at three locations has been approved for 2015.</td>
</tr>
<tr>
<td>Stillwater Mining Company Blitz Ridge -</td>
<td>Yes</td>
<td>2012-2014</td>
<td>Past</td>
<td>Yes</td>
<td>Yes</td>
<td>Helicopter and ground-supported exploratory drilling at 10 sites in the Benbow area. Approved</td>
</tr>
<tr>
<td>Past, present, or reasonably foreseeable future actions</td>
<td>On NFS Lands (Yes/No)</td>
<td>Estimated Period of Activity (Calendar Year)</td>
<td>Past, Present, or Reasonably Foreseeable Future Actions (RF)</td>
<td>Within Project Area</td>
<td>Within Ranger District Boundary</td>
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<tr>
<td>2012 Surface Exploration Drilling Plan of Operations for Mineral Exploration</td>
<td></td>
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<td>drilling at these sites occurred in fall 2012, summer 2013, summer 2014. Included construction of drill pad at portal location and improvement of access trail to portal location. Reclamation not yet completed at portal location.</td>
</tr>
<tr>
<td>Mining and mineral exploration in Stillwater Valley</td>
<td>Yes</td>
<td>1883 to present</td>
<td>Past, Present, RF</td>
<td>Yes</td>
<td>Yes</td>
<td>Mineral exploration and mining for copper, silver, gold, iron, chrome, and platinum group elements in Stillwater Complex rock at/near East Fishtail Creek, Benbow, Mountain View, Initial Creek, and Stillwater River Valley.</td>
</tr>
<tr>
<td>Benbow chromite mining and milling operations.</td>
<td>Yes</td>
<td>1941-1943</td>
<td>Past</td>
<td>Yes</td>
<td>Yes</td>
<td>Chrome mining on patented (private) lands adjacent to Little Rocky Creek. Transport and milling of mined materials onto National Forest lands at the Benbow mill site and deposition of chrome tailings north of Benbow mill site in Township 5S; Range 16E; NW ¼ of Section 21, P.M.M.</td>
</tr>
<tr>
<td>Horseman Flat Hazardous Fuels Reduction Project</td>
<td>Yes</td>
<td>2014 to 2018</td>
<td>Past, Present, RF</td>
<td>Yes</td>
<td>Yes</td>
<td>Mechanical and hand fuel reduction across 635 acres, including thinning, broadcast burning, and mastication along the West Fork Stillwater Road corridor and directly north of Stillwater Mining Company’s Nye mine.</td>
</tr>
<tr>
<td>Little Rocky Creek Aquatic Organism</td>
<td>Yes</td>
<td>2012 to 2013</td>
<td>Past</td>
<td>Yes</td>
<td>Yes</td>
<td>Replace two smaller diameter culverts with a large diameter culvert on Benbow Road #2414, as</td>
</tr>
<tr>
<td>Past, present, or reasonably foreseeable future actions</td>
<td>On NFS Lands (Yes/No)</td>
<td>Estimated Period of Activity (Calendar Year)</td>
<td>Past, present, or reasonably foreseeable future actions (RF)</td>
<td>Within Project Area</td>
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<tr>
<td>Passage project</td>
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<td></td>
<td>well as reconstruct the west approach between the culverts &amp; the Benbow mill site.</td>
</tr>
<tr>
<td>Little Rocky Allotment Management Plan</td>
<td>Yes</td>
<td>Annually</td>
<td>Past, present, RF</td>
<td>Yes</td>
<td>Yes</td>
<td>Ongoing permit for 591 animal unit months (AUMs) grazing on NFS lands in the project area. Little Rocky Allotment has an estimated 2,967 acres with 1,570 acres considered as primary livestock range.</td>
</tr>
<tr>
<td>West Fishtail Allotment Management Plan</td>
<td>Yes</td>
<td>Annually</td>
<td>Past, present, RF</td>
<td>Yes</td>
<td>Yes</td>
<td>Ongoing permit for 386 animal unit months (AUMs) grazing on NFS lands in the project area. West Fishtail Allotment has an estimated 2,500 acres with 870 acres considered as primary livestock range.</td>
</tr>
<tr>
<td>Beartooth Travel Management Plan and ongoing motorized use.</td>
<td>Yes</td>
<td>Annually</td>
<td>Present, RF</td>
<td>Yes</td>
<td>Yes</td>
<td>Implementation of 2008 Beartooth Travel Management Plan and ongoing motorized use authorized by this plan.</td>
</tr>
<tr>
<td>Beartooth Mountain</td>
<td>Yes</td>
<td>Annually through</td>
<td>Past, present, RF</td>
<td>Yes</td>
<td>Yes</td>
<td>Outfitter &amp; guide special use permit to the</td>
</tr>
<tr>
<td>Past, present, or reasonably foreseeable future actions</td>
<td>On NFS Lands (Yes/No)</td>
<td>Estimated Period of Activity (Calendar Year)</td>
<td>Within Project Area</td>
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<tr>
<td>Christian Ranch Outfitter and Guide Special Use Permit.</td>
<td>2015.</td>
<td>Past, Present, RF</td>
<td>Yes</td>
<td>Yes</td>
<td>Evangelical Church of North America DBA Beartooth Mountain Christian Ranch for 400 service user days for summer horseback day ride in the Little Rocky Creek area.</td>
<td></td>
</tr>
<tr>
<td>Beartooth Mountain Christian Ranch Road Special Use permit.</td>
<td>Yes Ongoing Past, Present, RF</td>
<td>Yes Yes</td>
<td>Right of way authorization for operation and maintenance of Road 24142 to access privately owned property.</td>
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</tr>
<tr>
<td>Stillwater Mining Company Road Use Special Use permit.</td>
<td>Yes Ongoing Past, Present, RF</td>
<td>Yes Yes</td>
<td>Right of way authorization for operation and maintenance of Road 24142.</td>
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</tr>
<tr>
<td>2006 Custer National Forest Final EIS for Weed Management</td>
<td>Yes Annually Past, Present, RF</td>
<td>Yes Yes</td>
<td>Forest-wide weed management activities.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Personal use permits for firewood harvest, landscape rock, Christmas tree permits.</td>
<td>Yes Annually Past, Present, RF</td>
<td>Yes Yes</td>
<td>Issuance of personal use permits for firewood, landscape rock, Christmas trees.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal use post and pole and teepee permits.</td>
<td>Yes Annually Past, Present, RF</td>
<td>Yes Yes</td>
<td>Annual issuance of permits in unit along Chrome Lake Jeep Trail (Road #2415)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aspen enhancement treatments in Benbow area</td>
<td>Yes 1980-present Past, present, RF</td>
<td>Yes Yes</td>
<td>Regenerate and maintain aspen stands throughout Benbow area via conifer removal, thinning, clear cutting, and prescribed burning.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010 Fishtail Butte Hazard</td>
<td>Yes 2010 to 2012 Past</td>
<td>Yes Yes</td>
<td>Hazard fuel reduction across 53 acres of USFS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Past, present, or reasonably foreseeable future actions</td>
<td>On NFS Lands (Yes/No)</td>
<td>Estimated Period of Activity (Calendar Year)</td>
<td>Past, Present, or Reasonably foreseeable Future Actions (RF)</td>
<td>Within Project Area</td>
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<td>Project Description</td>
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<tr>
<td>Fuel Reduction</td>
<td></td>
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<td></td>
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<td>lands adjacent to BLM parcel near Benbow Road. Completed in 2012.</td>
</tr>
<tr>
<td>BLM Fishtail Butte hazard fuel reduction project.</td>
<td>No</td>
<td>2010</td>
<td>Past</td>
<td>Yes</td>
<td>No</td>
<td>Fuel reduction on 40 acres adjacent to National Forest.</td>
</tr>
<tr>
<td>Beartooth Mountains Oil and Gas Leasing FEIS and ROD.</td>
<td>Yes</td>
<td>1993 to present.</td>
<td>RF</td>
<td>Yes</td>
<td>Yes</td>
<td>Administrative leasing of oil and gas parcels along the Beartooth Front. 1996 Decision made lands in the Benbow area available for oil and gas leasing. The FEIS Reasonably Foreseeable Development scenario includes prediction of a well in the Fishtail Creek area, approximately 5 miles east and south of the Benbow mill site. There is no current proposal for oil and gas exploration or development on the Beartooth District. If such a proposal is submitted, appropriate NEPA analysis would be completed prior to ground-disturbance occurring.</td>
</tr>
<tr>
<td>Private lands oil and gas development and production.</td>
<td>No</td>
<td>Unknown</td>
<td>Past, Present, RF</td>
<td>No</td>
<td>No</td>
<td>Information available from the Montana Board of Oil and Gas web mapper application indicates several active and abandoned oil and gas wells and ongoing development and production of petroleum resources in the Dean Dome structure, MacKay Dome structure, and various wildcat wells on private lands. This includes wells near Dean,</td>
</tr>
</tbody>
</table>
### Past, present, or reasonably foreseeable future actions

<table>
<thead>
<tr>
<th>On NFS Lands (Yes/No)</th>
<th>Estimated Period of Activity (Calendar Year)</th>
<th>Within Project Area</th>
<th>Within Ranger District Boundary</th>
<th>Project Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montana, approximately 4-5 miles northeast and 6 miles east of the proposed Portal location (plotted legal locations are T5S, R16E, Sections 12, 13, &amp; 254; T5S, R17E, Sections 7, 17, 18, 20, 21, 25, 26, 32, &amp; 33). Numerous additional wells are present approximately 8 miles SE of the nearest exploratory drill site in the MacKay Dome structure in the West Rosebud drainage.</td>
<td></td>
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</tbody>
</table>

| Benbow Analysis Area NFMA and NEPA. | Yes | 2016+ | RF | Yes | Yes | Forest Service NFMA analysis completed in 2012 for Beartooth Face to identify potential future vegetation management projects for NEPA analysis. Benbow area NEPA analysis scheduled to potentially begin in 2016+. |

### 2.7 CUSTER FOREST PLAN MANAGEMENT DIRECTION

As required by the NFMA, management direction for USFS lands in the Custer National Forest is specified in the 1986 Custer National Forest Land and Resource Management Plan (Forest Plan).

To comply with the Forest Plan, the USFS must consider how other resources and impacts from mining would be mitigated to the extent possible through standard operating procedures. Additionally, the USFS can prescribe mitigation measures to the Plan of Operations, as necessary to comply with the Forest Plan, to manage key surface resources. Mineral development cannot be precluded by these resource concerns within legal constraints. Efforts must be made to avoid or mitigate resource conflicts.

Forest-wide management standards specify that "Exploration and development of minerals will be facilitated subject to the General Mining Law of 1872 and subsequent regulations in 36 CFR 228 developed by the Secretary of Agriculture" (pg. 30, Chapter III, Custer Forest Plan). The
Proposed Action Alternative and Agency Mitigated Action Alternative are consistent with these standards to facilitate exploration of minerals. Other resource specific Forest wide standards are discussed in Chapter 3 by resource area. No forest-wide plan amendments are proposed.

The Forest Plan includes goals, objectives, and standards specific to the three management areas where mineral exploration activities are proposed (see map in project record). These are Management Area B (Grazing Emphasis), Management Area D (Habitat Management for Selected Species) and Management E (Minerals Management Emphasis). Applicable Forest Plan Direction for these Management Areas is discussed in the next three sections.

2.7.1 Management Area B

The LAD facilities, water treatment facility, waste rock storage area, and portions of the portal pad access road are proposed in Forest Plan Management Area B. Beneficial waste rock placement on roads, dispersed camp sites, and at the historic chrome tailings area are proposed in Management Area B. The goal for Management Area B (USDA 1986 pg 45) is “To provide for the continuation of livestock grazing, implementation of intensive range management systems and the facilitation of minerals and energy development with consideration of other resource needs. In areas not considered key for wildlife, adverse impacts to the wildlife habitat will be mitigated where feasible, but not to the exclusion of range and mineral/energy management and development activities. In key wildlife areas, the habitat may not be adversely impacted from development activities. If the responsible official determines that resource conflicts cannot be adequately mitigated, he/she will resolve the conflicts in accordance with management area goals and if necessary in consultation with affected parties.”

Additional Management Area B resource-specific management standards are listed on Forest Plan pages 45 to 47 and are also discussed and evaluated in Chapter 3 of this document.

2.7.2 Management Area D

Beneficial waste rock placement on roads, dispersed camp sites, and at the Chrome Lake Jeep Trail trailhead are proposed in Management Area D. Management Area D goals is “To maintain or improve the long-term diversity and quality of habitat for the selected species identified by Ranger District as well as accommodating other resource management activities such as timber harvest, livestock grazing, and oil and gas development. Some short-term habitat impacts may be necessary to achieve long-term wildlife goals. This goal will be achieved through direct wildlife habitat improvement, as well as selecting, scheduling and implementation of cultural practices associated with other multi-resource management activities. Efforts will be made to avoid or mitigate resource conflicts. If the responsible official determines that conflicts cannot be adequately mitigated, she/he will resolve the conflict in accordance with the management area goal and, if necessary, in consultation with affected parties.” (USDA 1986, pg 53).

Additional Management Area D resource-specific management standards are listed on Forest Plan pages 53 to 57.

2.7.3 Management Area E

The Benbow portal, majority of the portal pad access road, and injection well are proposed in Forest Plan Management Area E. Beneficial waste rock placement on roads and dispersed camp sites are proposed in Management Area B. The goal for Management Area E (USDA 1986 pg 58) is “To facilitate and encourage the exploration, development, and production of energy and
mineral resources from National Forest System lands. Other resources will be considered and impacts will be mitigated to the extent possible through standard operating procedures, and, on a limited basis, through special lease stipulations necessary to manage key surface resources. Energy/mineral development will not be precluded by these resource concerns within legal constraints. Efforts will be made to avoid or mitigate resource conflicts. If the responsible official determines that conflicts cannot be adequately mitigated, she/he will resolve the conflict in accordance with the management area goal and, if necessary, in consultation with affected parties.”

Additional Management Area E resource-specific management standards are listed on Forest Plan pages 58 to 60 and are also discussed and evaluated in Chapter 3 of this document.

2.7.4 Forest Plan Amendment
A northern goshawk nest was located in the project area during 2011 field review approximately 100 meters from the Portal drill site (see Wildlife analysis). The northern goshawk is a Management Indicator Species (MIS) for old growth timber in the Forest Plan (USDA 1986, p. 18). Under Alternatives 2 and 3, SMC’s proposed construction schedule includes mineral exploration activities during the northern goshawk breeding season, which is from April to August annually. Mitigation measures precluding mineral exploration activities during the northern goshawk breeding season would encumber this otherwise lawful mineral exploration project unreasonably and would not meet Management Area B and E goals. Therefore a site-specific Forest Plan amendment for the action alternatives is proposed.

The proposed Forest Plan amendment would waive the Stillwater Mining Company’s Benbow Exploration Portal and Support Facilities Plan of Operations for Mineral Exploration from the Management Standard for goshawk on page 18 under e. Habitat Indicator Species (Management Indicator Species) which states “The forest will provide for the maintenance and improvement of habitats for these indicator species.” as well as the management area standard in Management Area B at page 45, 2. Wildlife and Fish a. Emphasis will be to maintain existing fish and wildlife habitats, pursuant to 36 CFR 219.17. Direct, indirect and cumulative effects to northern goshawk are summarized in Table 3.3.11. Of 254 acres of northern goshawk nesting habitat within the project area, 10 acres would be removed by the construction of the portal pad, access road, and waste rock storage. Long-term, the project footprint would not substantially affect the amount or quality of northern goshawk nesting habitat. However, the northern goshawk would be directly or indirectly affected by project activities including human presence near nesting habitat, construction noise, and the blasting actions associated with the portal and decline construction. See the Wildlife analysis for detail regarding the direct, indirect and cumulative effects to northern goshawk.

2.8 COMPARISON OF EFFECTS

Table 2.10 provides a summary comparison of the effects of the alternatives for various issues. Additional information about effects to these resources is available in Chapter 3 and the project record. Chapter 3 discusses the affected environment and effects of alternatives by issue area.
Table 2.10. Comparison of Alternatives.

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<tr>
<td>Economic effects</td>
<td>From an economics perspective, Alternative 2 or 3 would beneficially affect the local economy due to increased direct payroll and full-time positions through 2019. Alternative 1 would not affect the local economy. Changes in payroll and jobs in the County Region through 2019 would be no change for Alternative 1, a 0.05% increase for Alternative 2, and a 0.06% increase for Alternative 3. Overall trends in the number of jobs and employment payroll in the County Region would be expected to continue. Cumulatively, SMC’s exploration would not be expected to significantly affect the economy at the County, County region, State, or National scale.</td>
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<tr>
<td>Effects to Recreation, Aesthetics, and Access</td>
<td>Alternative 1 would maintain existing recreation opportunities and access for recreation in the area. There would be no increased traffic and no additional areas with hunting restrictions.</td>
<td>Traffic, noise, dust and smoke from the mineral exploration placement operations would have a greater effect to project area dispersed recreation users, aesthetics, and access than Alternative 1 and less effects than Alternative 3. Recreation users would be displaced and have fewer dispersed recreation opportunities and less access for the estimated time frame of four years. In the long-term, most recreation opportunities would not be adversely affected. During exploration operations, there would be a 32% increase in traffic at the intersection with State Highway 419 and a 118% increase in traffic beyond the Beartooth Mountain Christian Ranch turn-off. Following exploration, there would be a 12% increase in traffic at the intersection with State Highway 419 and a 29% increase in traffic beyond the Beartooth Mountain Christian Ranch turn-off. Approximately 71 acres around facilities and 0.9 miles along the Portal Access road would have additional hunting restrictions.</td>
<td>Traffic, noise, dust and smoke from the mineral exploration and waste rock placement operations would have a greater effect to project area dispersed recreation users, aesthetics, and access than Alternatives 1 or 2. Recreation users would be displaced and have fewer dispersed recreation opportunities and less access for the estimated time frame of four years. In the long-term, most recreation opportunities would not be adversely affected. During exploration operations and beneficial waste rock use, there would be an 89% increase in traffic at the intersection with State Highway 419 and a 323% increase in traffic beyond the Beartooth Mountain Christian Ranch turn-off. Following exploration and beneficial waste rock placement, there would be a 12% increase in traffic at the intersection with State Highway 419 and a 29% increase in traffic beyond the Beartooth Mountain Christian Ranch turn-off. Approximately 67.2 acres around facilities and 0.9 miles along the Portal Access road would have additional hunting restrictions. Beneficial waste rock operations would provide greater long-term benefit and resource protection through better access to the Benbow Jeep trail.</td>
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<tr>
<td>Noise effects to Wildlife</td>
<td>Relatively high ambient levels</td>
<td>Mining construction and blasting would displace animals or directly harm (breeding birds); noise predicted to affect about 4,000 acres.</td>
<td>Similar to Alternative 2, but with potential for additional disturbance due to beneficial use of waste rock over a larger area.</td>
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<tr>
<td>Effects to Big Game Habitat</td>
<td>Low security areas and low habitat effectiveness.</td>
<td>Project would affect 33 acres of habitat; possible increase in forage in LAD area; no change in security areas or habitat effectiveness.</td>
<td>No real change in cover, forage, security areas, or habitat effectiveness.</td>
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<tr>
<td>Effects to Northern Goshawk</td>
<td>Continued nesting Northern Goshawk or Cooper’s Hawk in Primary Foraging Area (PFA).</td>
<td>Project would affect 10 acres of nesting habitat; likelihood of PFA abandonment due to human activity and noise.</td>
<td>Same as Alternative 2 with the possibility that human use would increase (and therefore disturbance) with improved roads and trailheads.</td>
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<tr>
<td>Effects to Canada Lynx</td>
<td>Very little lynx habitat in project area.</td>
<td>Project would affect only 1 acre of multi-story mature lynx habitat. Snowplowing and snow compaction effects would be discountable.</td>
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<tr>
<td>Effects to Lynx Critical habitat</td>
<td>Very little Principal Component Elements (PCE) of Critical Habitat 1a in project area.</td>
<td>Project would affect 31 acres of matrix habitat; no change in habitat connectivity.</td>
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<tr>
<td>Effects to Grizzly Bear</td>
<td>Low quality habitat in project area; within high quality BAU.</td>
<td>No effect on secure habitat; a slight increase in Total Motorized Access Route Density. Food storage requirements should prevent conflicts. Noise and human activity would likely result in grizzly bear avoidance of project area.</td>
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<tr>
<td>Effects to vegetation</td>
<td>No additional impacts to vegetation resources beyond the 1.1 acres already impacted by SMC’s recent mineral exploration activities in the analysis area.</td>
<td>Approximately 105 acres of vegetation affected by the combination of existing mineral exploration and new mineral exploration impacts. Reclamation would limit impacts and result in compliance with Forest Plan vegetation goals and State and Federal regulations for reclamation and revegetation requirements.</td>
<td>Approximately 48 acres of vegetation affected by the combination of existing mineral exploration and new mineral exploration impacts. Reclamation would limit impacts and result in compliance with Forest Plan vegetation goals and State and Federal regulations for reclamation and revegetation requirements.</td>
</tr>
<tr>
<td>Effects to range</td>
<td>No change to existing range management.</td>
<td>Range management would change to account for higher forage production levels in LAD</td>
<td>No change to existing range management.</td>
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<td>management</td>
<td>pivot irrigation areas. This would include creating two new pastures and additional water sources to redistribute livestock grazing within the existing Little Rocky Grazing Allotment.</td>
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<td>Effects to sensitive plant species</td>
<td>There would be no direct or indirect effects on sensitive plants from any alternative due to the lack of habitat for seven listed species, the small amount of habitat present for the remainder, and the negative presence of sensitive species revealed during surveys.</td>
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<td>Effects to Noxious Weed spread</td>
<td>The No Action Alternative would limit the contribution to spread of noxious weeds since minimal lands would be disturbed or roads used by the project.</td>
<td>81 disturbed acres and immediately adjacent acres prone to weed invasion. Frequent project-related trips along 5.7 miles of road would result in approximately 176 acres susceptible to weed invasion from road vectors. Predicted effects would comply with the applicable weeds standards and guidelines set forth in law, regulation, policy, other authorities, and the Forest Plan.</td>
<td>181 disturbed acres and immediately adjacent acres prone to weed invasion. Frequent project-related trips along 6.5 miles of road would result in approximately 157 acres susceptible to weed invasion from road vectors. Predicted effects would comply with the applicable weeds standards and guidelines set forth in law, regulation, policy, other authorities, and the Forest Plan.</td>
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<tr>
<td>Changes to groundwater quantity</td>
<td>No effect.</td>
<td>Low risk of reduction in groundwater quantity. Groundwater availability within the regional bedrock flow system (primarily the Madison Limestone) would be reduced by approximately 100 gallons per minute due to inflows to the decline. This is an insignificant fraction of the total groundwater availability within the regional bedrock aquifer. Beneficial uses would be met.</td>
<td>Low risk of reduction in groundwater quantity. Beneficial uses would be met.</td>
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<tr>
<td>Changes to groundwater quality</td>
<td>No effect.</td>
<td>Low risk of delivery of elevated nitrogen compounds and salts to groundwater beneath the LAD site, but no water quality violations are anticipated.</td>
<td>Concentrations of nitrogen compounds in the Madison Limestone aquifer may increase in the vicinity of the injection well, but no water quality violations are anticipated.</td>
</tr>
<tr>
<td>Changes to surface water</td>
<td>No effect</td>
<td>Negligible increase in water yield, no change in peak flow or base flow projected. Beneficial uses would be met.</td>
<td>No changes in water yield, peak flow, and/or base flow projected. Beneficial uses would be met.</td>
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<tr>
<td>Changes to surface water quality</td>
<td>No effect</td>
<td>Increase in sediment from roads during implementation, sediment yield back to existing following completion of project activities. Low risk of delivery of other constituents to adjacent water bodies, but no water quality violations anticipated.</td>
<td>Increase in sediment from roads during implementation, net decrease following completion of reclamation and beneficial waste rock application/stream bank stabilization.</td>
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<tr>
<td>Sediment effects on aquatic habitat and biota</td>
<td>No effect</td>
<td>Short-term sediment increase may impact individuals or habitat but would not be of sufficient magnitude or duration to impact populations. No long-term effects.</td>
<td>Short-term sediment increase may impact individuals or habitat but would not be of sufficient magnitude or duration to impact populations. Long-term sediment reduction and net improvement to aquatic habitat.</td>
</tr>
<tr>
<td>Physical disturbance and modification to aquatic habitats</td>
<td>No effect</td>
<td>Instream construction activities may impact individuals or habitat but would not affect populations.</td>
<td>Instream construction activities may impact individuals or habitat but would not affect populations. Reclamation of stream bank at Chrome Tailings would improve aquatic habitat.</td>
</tr>
<tr>
<td>Change in Soil Quality</td>
<td>No effect</td>
<td>Net loss of soil quality during project implementation, following reclamation and recovery soil quality would be partially restored to pre-implementation conditions and continue recovery over time.</td>
<td>Same as Alternative 2, but extent of impacts would be reduced by 8 acres.</td>
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<tr>
<td>Effects to Physical Soil Properties</td>
<td>No effect</td>
<td>Impairment of physical soil properties through topsoil stockpiling, excavation, and equipment operation would occur during project implementation. Soil properties would slowly recover following reclamation.</td>
<td>Same as Alternative 2, but reduced in extent by approximately 8 acres. Beneficial waste rock application to roads is projected to reduce road-related erosion and sedimentation.</td>
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<tr>
<td>Effects to Soil Organic Matter and Nutrients</td>
<td>No effect</td>
<td>Area under the LAD pivots would experience an increase in soil organic matter and nutrient cycling during LAD application. Laydown areas and other cleared locations would see a net reduction in soil organic matter and some change in nutrient form. This attribute would recover</td>
<td>Reduced extent over which soil organic matter and nutrient cycling would be compromised. No increase in soil organic matter or nutrient cycling would occur across the Benbow Bench. This soil attribute would slowly recover following reclamation.</td>
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<tr>
<td>Effects to Soil Organisms</td>
<td>No effect</td>
<td>Effects are expected to be roughly commensurate with organic matter dynamics. Change in community composition as a result of LAD unlikely. Soil organisms would recover over time following completion of reclamation activities</td>
<td>Effects are expected to be roughly commensurate with organic matter dynamics. Soil organisms would recover over time following completion of reclamation activities</td>
</tr>
<tr>
<td>Effects to Soil Erosion</td>
<td>No effect</td>
<td>Increased susceptibility to erosion during implementation. No net loss of sediment from project areas is expected through proper design criteria implementation.</td>
<td>The area susceptible to erosion is reduced from Alternative 2. Net reduction in erosion as a result of beneficial waste rock on roads.</td>
</tr>
<tr>
<td>Effects to cultural resources</td>
<td>Alternative 1 would not contribute to the preservation and protection of the Historic Mining Landscape and ongoing vandalism and collection of artifacts would continue.</td>
<td>Alternative 2 would have the fewer negative effects to historic properties than Alternative 3. Roadwork for the Benbow road and the Chrome Mountain Jeep trail proposed in Alternatives 2 and 3 would require consultation with the MTSHPO to mitigate adverse effects. Waste rock placement on other potentially historic roads would require further survey and evaluation and additional consultation. Only one culturally sensitive site was recorded within the Benbow Project Area. Proposed roadwork in Alternative 3 may have a detrimental effect on this site. Consultation with the Crow Cultural Committee would be required to determine proper and respectful mitigation options.</td>
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</tbody>
</table>
2.9 CHAPTERS 1 AND 2 REFERENCES CITED


36 CFR 228a. Title 36 Parks, Forests, and Public Property, Part 228, Subpart A. Locatable Minerals. Available online at: http://ecfr.gpoaccess.gov/cgi/t/text/text-idx;c=ecfr&tpl=/ecfrbrowse/Title36/36cfr228_main_02.tpl

40 CFR 1500. Title 40 Protection of the Environment, Council on Environmental Quality Regulations for Implementing NEPA. Available online at: http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?sid=86baf4891a1e0bd9f318e23fd065d2ca&c=ecfr&tpl=/ecfrbrowse/Title40/40cfrv33_02.tpl

40 CFR 141-143. Title 40 Protection of the Environment, Chapter 1 Environmental Protection Agency, Subchapter D – Water programs (Safe Drinking Water Act). Available online at: http://www.ecfr.gov/cgi-bin/text-idx?SID=0fb73545bb2880d29a4bc1ef35357598&tpl=/ecfrbrowse/Title40/40cfrv23_02.tpl#0


Montana Code Annotated 2015d. Title 75. Environmental Protection, Chapter 5. Water
Quality. Available online at:  http://leg.mt.gov/bills/mca_toc/75_5.htm


