Summary

Purpose and Need for Action

Background

This document presents a summary of the Draft Environmental Impact Statement (Draft EIS) for the proposed Montanore Project. As a summary, it cannot provide all of the detailed information contained in the Draft EIS. If more detailed information is desired, please refer to the Draft EIS and the referenced reports. For any remaining questions or concerns, contact the individuals listed in the last section of this summary, *Where to Obtain More Information.*

The U.S. Department of Agriculture (USDA), Kootenai National Forest (KNF), and the Montana Department of Environmental Quality (DEQ) have prepared the Draft EIS in compliance with the National Environmental Policy Act (NEPA) and the Montana Environmental Policy Act (MEPA). These laws require that if any action taken by the DEQ or the KNF may "significantly affect the quality of the human environment," an environmental impact statement must be prepared. This Draft EIS also has been prepared in compliance with the USDA NEPA policies and procedures (7 Code of Federal Regulations (CFR) part 1b), the Forest Service's Environmental Policy and Procedures Handbook (Forest Service Handbook 1909.15), DEQ's MEPA regulations (Administrative Rules of Montana (ARM) 17.4.601 *et seq.*), and the U.S. Army Corps of Engineers' (Corps) NEPA implementation procedures for its regulatory program (Appendix B of 33 CFR 325). Two "lead" agencies have been designated for this project: the KNF and the DEQ. Cooperating agencies are the Bonneville Power Administration (BPA), Corps, and Lincoln County, Montana. A single Draft EIS for the Montanore Project is being prepared to provide a coordinated and comprehensive analysis of potential environmental impacts. Before construction and operation of the proposed project could begin, various other permits, licenses, or approvals from the two lead agencies and other agencies would be required.

The Proposed Action, the Montanore Project, is a proposed copper and silver underground mine and associated transmission line located about 18 miles south of Libby near the Cabinet Mountains of northwestern Montana. The ore body is beneath the Cabinet Mountains Wilderness (CMW). All access and surface facilities would be located outside of the CMW boundary. Montanore Minerals Corp. (MMC), a wholly owned subsidiary of Mines Management, Inc. (MMI), would be the project operator.

The discovery of mineral deposits for the Montanore Project dates back to the early 1980s. In 1980, Heidelberg Silver Mining Company (Heidelberg) located certain mining claims in sections 29 and 30 of Township 27 North, Range 31 West, M.M., Sanders County, Montana. Subsequently, in 1983, Pacific Coast Mines, Inc. (Pacific), a subsidiary of U.S. Borax and Chemical Corporation (Borax), located other mining claims in sections 29 and 30 of Township 27 North, Range 31 West, M.M., Sanders County, Montana. The mining claims located by Pacific in 1983 included the lode mining claims Hayes Ridge (HR) 133 and HR 134 adjacent to Rock Lake. (These claims are shown on Figure 11 in the EIS.) This outcrop contained stratabound copper-silver mineralization, extending over a 200-foot vertical thickness.

In 1984, Pacific leased Heidelberg's mining claims pursuant to the terms of a 1984 Lease and Option to Purchase Agreement (Lease Agreement). Subsequently, in 1988, Heidelberg was merged into Newhi, Inc. (Newhi), a subsidiary of Mines Management, Inc. (MMI). As a result of that merger, Newhi became the successor in interest to Heidelberg under the Lease Agreement. Also in 1988, Pacific assigned its interest in HR 133 and HR 134 and its interest in the Lease Agreement to Noranda Minerals Corporation (Noranda), a subsidiary of Noranda Finance Inc. (Noranda Finance).

In 2002, Noranda terminated the Lease Agreement with Newhi. Pursuant to the terms of that agreement, Noranda conveyed its interest in HR 133 and HR 134 to Newhi. In 2006, Newhi acquired all of the issued and outstanding shares of Noranda. Immediately following the acquisition of Noranda, Noranda's name was changed to Montanore Minerals Corporation (MMC).

The permitting process for the Montanore Project began in 1989. In that year, Noranda obtained an exploration license from the Montana Department of State Lands (DSL) and other associated permits for construction of an exploration adit from private land in upper Libby Creek. Soon after obtaining the exploration license, Noranda began excavating the Libby Adit. Noranda also submitted a "Petition for Change in Quality of Ambient Waters" (Petition) to the Board of Health and Environmental Sciences (BHES) requesting an increase in the concentration of select constituents in surface and ground water above ambient water quality, as required by Montana's 1971 nondegradation statute. After constructing about 14,000 feet of the Libby Adit, Noranda ceased construction in 1991 in response to elevated nitrate concentration in surface water and low metal prices.

Although construction ceased in 1991, the permitting process continued. Specifically, the KNF, the Montana Department of Health and Environmental Sciences (DHES), the Montana Department of Natural Resources and Conservation (DNRC), and the DSL, DEQ's predecessor agency, prepared a Draft, Supplemental Draft, and Final EIS on the proposed project. The environmental review process culminated in 1992 with BHES's issuance of an Order approving Noranda's Petition (BHES 1992) and the DSL's issuance of a Record of Decision (ROD) and Hard Rock Operating Permit #00150 (DSL 1992) to Noranda. In 1993, the KNF issued its ROD (KNF 1993), the DNRC issued a Certificate of Environmental Compatibility and Public Need under MFSA (DNRC 1993), and the U.S. Army Corps of Engineers issued a 404 permit (Corps 1993). These decisions selected mine and transmission line alternatives that allowed for the construction, operation, and reclamation of the project.

The BHES Order, issued to Noranda in 1992, authorized degradation and established nondegradation limits in surface and ground water adjacent to the Montanore Project for discharges from the project (BHES 1992). The Order established numeric nondegradation limits for total dissolved solids, chromium, copper, iron, manganese, and zinc (both surface and ground water), as well as nitrate (ground water only), and total inorganic nitrogen (surface water only). Pursuant to BHES's Order, these nondegradation limits apply to all surface and ground water affected by the Montanore Project and remain in effect during the operational life of the mine and for so long thereafter as necessary (BHES 1992). The Order also adopted the modification developed in Alternative 3, Option C, of the Final EIS, addressing surface and ground water monitoring, fish tissue analysis, and in-stream biological monitoring. The Order is presented in Appendix A in the EIS.

In 1997, a Montana Pollutant Discharge Elimination System (MPDES) permit was issued to Noranda by the DEQ (MT-0030279) to allow discharges of water flowing from the Libby Adit to Libby Creek. Three outfalls were included in the permit: Outfall 001 – percolation pond; Outfall 002 – infiltration system of buried pipes; and Outfall 003 – pipeline outlet to Libby Creek. Surface discharge from the adit ceased in 1998 and water in the adit flowed to the underlying ground water.

Apart from the permitting process, Noranda filed an application for patent with the Bureau of Land Management (BLM) in 1991 for lode claims HR 133 and HR 134 (Patent Application MTM 80435). In 1993, a Mining Claim Validity Report was issued by BLM recommending that BLM issue patent to Noranda for HR 133 and HR 134. In 2001, a patent was issued to Noranda for the portion of HR 134 that lies outside the CMW (Patent Number 25-2001-0140) and a separate patent was issued to Noranda for the mineral deposits for HR 133 and the portion of HR 134 that lies inside the CMW (Patent Number 25-2001-0141).

As discussed above, Noranda conveyed its interests in lode claims HR 133 and HR 134 to Newhi in 2002. By that time, many of Noranda's permits for the Montanore Project terminated or expired, such as DEQ's air quality permit, the Corps' 404 permit, KNF's approval, and the State's certification of the transmission line. In 2002, Noranda notified the KNF it was relinquishing the authorization to operate and construct the Montanore Project. Noranda's DEQ Operating Permit #00150 and MPDES permit were not terminated because reclamation of the Libby Adit was not completed.

Proposed Action

In 2005, MMI submitted an application for a hard rock operating permit to the DEQ and a proposed Plan of Operations for the proposed Montanore Project to the KNF. MMI also submitted to the DEQ an application for a 230-kV transmission line certificate of compliance, an application for an air quality permit, and an application for a MPDES permit that covered additional discharges not currently permitted under the existing MPDES permit for the Libby Adit.

In 2006, Newhi acquired all of the issued and outstanding shares of Noranda pursuant to the terms of a Stock Transfer Agreement between Noranda Finance, Newhi, and MMI. Although the name of Noranda was changed to Montanore Minerals Corporation (MMC) immediately following Newhi's acquisition of Noranda's shares, MMC (formerly Noranda) remains the holder of DEQ Operating Permit #00150 and the MPDES permit for the Montanore Project.

MMI and MMC advised the agencies that MMC will be the owner and operator of the Montanore Project. Consistent with that indication, Newhi has re-conveyed HR 133 and HR 134 to MMC, and MMI and MMC have requested that the DEQ consider MMI's application for a hard rock operating permit as an application by MMC for modification to DEQ Operating Permit #00150. MMC submitted an updated Plan of Operations to the agencies in 2008 that clarified differences between the 2005 Plan of Operations and DEQ Operating Permit #00150. It also incorporated plans required by DEQ Operating Permit #00150 and additional environmental data collected since 2005. With minor exceptions, MMC proposes to construct, operate, and reclaim a new mine and transmission line in accordance with the terms and conditions of DEQ Operating Permit #00150 and in accordance with the terms and conditions of the other agencies' permits and

approvals issued to Noranda in 1992 and 1993. The requested changes to DEQ Operating Permit #00150 are:

- Construction of an additional underground ventilation infrastructure that would disturb about 1 acre of private land near Rock Lake
- Relocation of the concentrate loadout facility to the Kootenai Business Park located in Libby (private land) resulting in less than 1 acre of disturbance
- Installation of a buried powerline along the Bear Creek Road (NFS road #278), which would be reconstructed for access
- Construction of a temporary electrical substation adjacent to the Ramsey Creek Road (NFS road #4781), which would be reconstructed for access
- A change in the construction technique proposed for the Little Cherry Creek Impoundment from downstream to centerline
- Installation of a water pipeline from the Libby Adit to the land application and disposal (LAD) Areas

Other changes may be required to conform Operating Permit #00150 to the alternative selected by the KNF. MMC and the DEQ agreed to hold the request for modification to the permit in abeyance until completion of the environmental review process.

MMC's Plan of Operations is considered as a new Plan of Operations by the KNF because Noranda relinquished the federal authorization to construct and operate the Montanore Project in 2002. Both the KNF and the DEQ consider MMC's proposed 230-kV North Miller Creek transmission line to be part of the Proposed Action as the 1993 Certificate of Environmental Compatibility and Public Need for the 230-kV transmission line expired.

Libby Adit Evaluation Program

Following the acquisition of Noranda and DEQ Operating Permit #00150, MMC submitted, and the DEQ approved in 2006, two requests for minor revisions to DEQ Operating Permit #00150 (MR 06-001 and MR 06-002). The KNF has not approved any activities at the Libby Adit that may affect National Forest System lands. The revisions involved reopening the Libby Adit and re-initiating the evaluation drilling program that Noranda began in 1989. The key elements of the revisions include: excavation of the Libby Adit portal; initiation of water treatability analyses; installation of ancillary facilities; dewatering of the Libby Adit decline; extension of the current drift; and underground drilling and sample collection.

The KNF determined the activities associated with the Libby Adit evaluation drilling were a new proposed Plan of Operations under the Federal Locatable Minerals Regulations (36 CFR 228 Subpart A), and MMC needed KNF approval prior to dewatering and continuing excavation, drilling, and development work at the Libby Adit. Under the authority of Minor Revision 06-002 of the DEQ operating permit, MMC has installed a water treatment plant and is allowed to treat free flowing water from the adit.

In 2006, the KNF initiated a NEPA analysis that included public scoping for the proposed road use and evaluation drilling at the Libby Adit Site. In 2008, the KNF decided the best approach for disclosing the environmental effects of the Libby Adit evaluation program was to consider this

activity as the initial phase for the overall Montanore Project EIS. The Libby Adit evaluation program would be the first phase of the Montanore Project in Alternatives 3 and 4.

Purpose and Need

The Forest Service's and DEQ's overall purpose and need is to process MMC's Plan of Operations, permit applications and application for modification of DEQ Operating Permit #00150, and follow all applicable laws, regulations, and policies pertaining to each pending application. The need, from the perspective of the Forest Service, is to:

- Respond to MMC's proposed Plan of Operations to develop and mine the Montanore copper and silver deposit
- Ensure the selected alternative would comply with other applicable federal and state laws and regulations
- Ensure the selected alternative, where feasible, would minimize adverse environmental impacts on National Forest System surface resources
- Ensure measures would be included, where practicable, that provide for reclamation of the surface disturbance

In accordance with the Clean Water Act, the Corps is required to consider and express the activity's underlying purpose and need from the applicant's and public's perspectives. From the Corps' perspective, the underlying project purpose is to provide copper and silver from deposits contained in northwestern Montana in an economically viable manner to meet a portion of current and future public demands.

The MEPA and its implementing rules ARM 17.4.601 *et seq.*, require that EISs prepared by state agencies include a description of the purpose and benefits of the proposed project. MMC's project purpose is described below. Benefits of the proposed project include increased employment in the project area, increased tax payments, and the production of copper and silver to help meet public demand for these metals. The Major Facility Siting Act (MFSA) (75-20-101 *et seq.*, Montana Code Annotated (MCA) and an implementing rule, ARM 17.20.920, require that the DEQ determine the basis of the need for a facility and that an application for an electric transmission line contain an explanation of the need for the facility. No electrical distribution system is near the project area. The nearest electrical distribution line parallels U.S. 2 and it is not adequate to carry the required electrical power. A new transmission line is needed to supply electrical power to construct, operate, and reclaim the proposed mine facilities.

BPA's transmission system in northwestern Montana provides reliable power to BPA's customers. BPA has a need therefore to improve its transmission system to ensure continued reliable electrical power for all of its customers. BPA's purposes are goals to be achieved while meeting the need for the project; the goals are used to evaluate the alternatives proposed to meet the need.

MMC's project purpose is to develop and mine the Montanore copper and silver deposit by underground mining methods with the expectation of making a profit. MMC's need is to receive all necessary governmental authorizations to construct, operate, and reclaim the proposed Montanore Mine and the associated transmission line, and all other incidental facilities. MMC proposes to construct, operate, and reclaim the Montanore Project in an environmentally sound

manner, subject to reasonable mitigation measures designed to avoid or minimize environmental impacts to the extent practicable.

Decisions

The KNF Supervisor will issue a decision on MMC's proposal in a ROD. The decision objective is to select an action that meets the legal rights of MMC, while protecting the environment in compliance with applicable laws, regulations, and policy. The KNF Supervisor will use the EIS process to develop the necessary information to make an informed decision as required by 36 CFR 228, Subpart A. The Corps will decide whether to provide a 404 permit based on MMC's 404 permit application and information in this EIS. MMC will submit a Section 404 permit application to the Corps for the alternative selected by the lead agencies. The Corps will issue a ROD on its permit decision. Before deciding to provide a tap for electrical power for MMC's project, the BPA will prepare a decision document for its part of the project. The U.S. Fish and Wildlife Service (USFWS) will decide if implementation of the project would jeopardize the continued existence of any species listed or proposed as threatened or endangered under the Endangered Species Act (ESA), or adversely modify critical or proposed critical habitat for a threatened or endangered species, based on a biological assessment (BA) prepared by the KNF. The DEQ will issue a ROD containing its decisions pursuant to each of the project-related permit applications including MMC's MFSA certificate of compliance application, MPDES, air quality, and other permit applications, and a decision on MMC's application for modification of DEQ Operating Permit #00150.

Public Involvement

A Notice of Intent was published in the *Federal Register* on July 15, 2005. The Notice described KNF and DEQ's intent to prepare an EIS for the proposed Montanore Project, set the dates for public scoping meetings, and solicited public comments. In addition, as part of the public involvement process, the lead agencies issued press releases, mailed scoping announcements, and held three public meetings. Based on the comments received during public scoping, the KNF and the DEQ identified seven key issues that drove alternative development. The key issues that led the lead agencies to develop alternatives to the Proposed Action were:

- Issue 1: Potential for acid rock drainage and near neutral pH metal leaching
- Issue 2: Effects on quality and quantity of surface and ground water resources
- Issue 3: Effects on fish and other aquatic life and their habitats
- Issue 4: Changes in the project area's scenic quality
- Issue 5: Effects on threatened and endangered wildlife species
- Issue 6: Effects on wildlife and their habitats
- Issue 7: Effects on wetlands and non-wetland waters of the U.S.

Alternatives

Alternatives were developed based on requirements for alternatives under regulations implementing NEPA, MEPA, MFSA, and Section 404 of the Clean Water Act. To develop a reasonable range of alternatives, the agencies separated the proposed Montanore Project into components. Components are discrete activities or facilities (*e.g.*, plant site or tailings

impoundment) that, when combined with other components, form an alternative. Options were identified for each component. An option is an alternative way of completing an activity, or an alternative geographic location for a facility (component), such as alternative geographic locations for a tailings impoundment or transmission line, or an alternative method of tailings disposal, such as paste tailings. Options generate the differences among alternatives. An alternative is a complete project that has all the components necessary to fulfill the project purpose and need. The agencies considered options for the following project components:

- Underground mine
- Plant site and adits
- Tailings disposal methods and impoundment location
- Land application disposal areas
- Access road
- Transmission line

Besides a No Action and a Proposed Action for both the mine facilities and transmission line, the lead agencies analyzed in detail two mine alternatives and three transmission line alternatives.

Mine Alternatives

Alternative 1—No Action, No Mine

Under this alternative, MMC would not develop the Montanore Project, although it is approved under DEQ Operating Permit #00150. The Montanore Project cannot be implemented without a corresponding KNF approval of the Plan of Operations. The environmental, social, and economic conditions described in Chapter 3 would continue, unaffected by the construction and operation of the mine or a transmission line. The DEQ's approval of the mine, as permitted by DEQ Operating Permit #00150, would remain in effect. The DEQ's approval of revisions to DEQ Operating Permit #00150 (Minor Revisions 06-001 and 06-002) also would remain in effect. MMC could continue with the permitted activities on private land associated with the Libby Adit evaluation program that do not affect National Forest System lands. The conditions under which the KNF could select Alternative 1 or DEQ deny the MPDES and air quality permits, transmission line certificate, and MMC's operating permit modifications are described in section 1.6, *Agency Roles, Responsibilities, and Decisions* of Chapter 1 of the EIS.

Alternative 2—MMC's Proposed Mine

As proposed by MMC, the Montanore Project would consist initially of a 12,500-tons-per-day underground mining operation that would expand to a 20,000-tons-per-day rate. The surface mill (the Ramsey Plant Site) would be located on National Forest System lands outside of the CMW in the Ramsey Creek drainage. The proposed project also would require constructing about 16 miles of high-voltage electric transmission line from a new substation adjacent to BPA's Noxon-Libby transmission line to the project site. The 230-kilovolt (kV) transmission line alignment would be from the Sedlak Park Substation in Pleasant Valley along U.S. 2, and then up the Miller Creek drainage to the project site. The proposed transmission line is considered as a separate alternative below (see Alternative B). The location of the proposed project facilities is shown on Figure S-1.

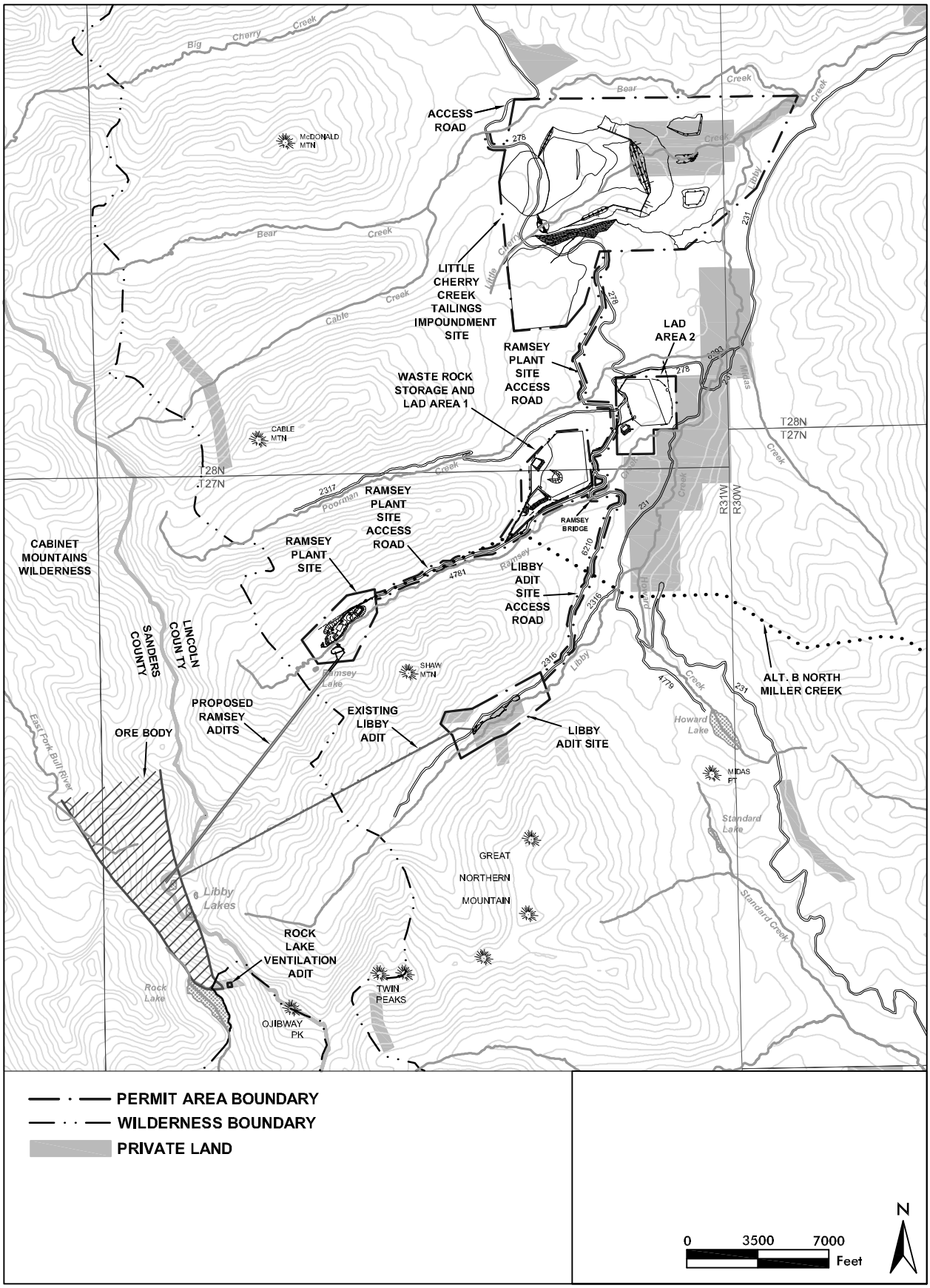


Figure S-1. Mine Facilities and Permit Areas, Alternative 2

The ore body would be accessed from two adits adjacent to the mill. Two other adits, an evaluation/ventilation adit and a ventilation adit, both with entrances located on private land, also would be used during the project. The evaluation/ventilation adit would be located in the upper Libby Creek drainage; the ventilation adit would be located on MMC's private land (patented claim HR 134) in the upper East Fork Rock Creek drainage near Rock Lake. The additional 1-acre disturbance for the ventilation adit is part of MMC's requested DEQ Operating Permit #00150 modifications.

The mineralized resource associated with the Montanore subdeposit is about 135 million tons. MMC anticipates mining up to 120 million tons. Ore would be crushed underground and conveyed to the surface plant located near the Ramsey Adits. Copper and silver minerals would be removed from the ore by a flotation process. Tailings from the milling process would be transported through a pipeline to a tailings impoundment located in the Little Cherry Creek drainage, about 4 miles from the Ramsey Plant Site.

Access to the mine and all surface facilities would be via U.S. 2 and the existing National Forest System road #278, the Bear Creek Road. (Road names and numbers are used interchangeably in this EIS; a complete list of all road names and numbers is in Appendix B in the EIS.) With the exception of the Bear Creek Road, all open roads in the proposed operating permit areas would be gated and limited to mine traffic only. MMC would upgrade 11 miles of the Bear Creek Road and build 1.7 miles of new road between the Little Cherry Creek Tailings Impoundment Site and the Ramsey Plant Site. Silver/copper concentrate from the plant would be transported by truck to a rail siding in Libby, Montana. The rail siding and Libby Loadout facility are near one of the facilities considered in the 1992 Final EIS. The concentrate would then be shipped by rail to an out-of-state smelting facility.

MMC would discharge excess mine and adit wastewater at one of two LAD Areas. Additional water treatment would be added as necessary prior to discharge at the LAD Areas. Water treatment also would continue at the Libby Adit Site, if necessary. MMC would be required to submit a complete MPDES application for all additional outfalls. Additional proposed discharges include the LAD Areas, the Ramsey Plant Site, and the Little Cherry Creek Tailings Impoundment Site should this alternative be selected.

Mining operations would continue for an estimated 16 years once facility development was completed and actual mining operations started. Three additional years may be needed to mine 120 million tons. The mill would operate on a three-shifts-per-day, seven-days-per-week, year-long schedule. At full production, an estimated 7 million tons of ore would be produced annually during a 350-day production year. Employment numbers are estimated to be 450 people at full production. An annual payroll of $12 million is projected for full production periods.

The operating permit area would be 3,628 acres and the disturbance area would be 2,582 acres (Table S-1). The operating permit area would encompass 433 acres of private land owned by MMC for the proposed mine and associated facilities. All surface disturbances would be outside the CMW. MMC has developed a reclamation plan to reclaim disturbed areas.

Table S-1. Mine Surface Area Disturbance and Operating Permit Areas, Alternatives 2-4.

Facility	Alternative 2		Alternative 3		Alternative 4	
	Disturbance Area† (acres)	Permit Area (acres)	Disturbance Area† (acres)	Permit Area (acres)	Disturbance Area† (acres)	Permit Area (acres)
Existing Libby Adit Site	22	219	22	219	22	219
Upper Libby Adit	0	0	1	1	1	1
Rock Lake Ventilation Adit	1	1	1	1	1	1
Plant Site and Adits	52	185	110	172	110	172
Tailings Impoundment	1,928	2,458	1,359	1,585	1,602	2,191
LAD Area 1 and Waste Rock Storage Area§	247	261	260	277	260	277
LAD Area 2	183	226	123	196	123	196
Access Roads†	149	278	135	155	135	188
Total	2,582	3,628	2,011	2,606	2,254	3,245

†Disturbance area shown for roads excludes 33 feet of existing disturbance along roads.
§Waste rock would be stored within the disturbance area of the tailings impoundment in Alternatives 3 and 4, and not at LAD Area 1.

Alternative 3—Agency Mitigated Poorman Impoundment Alternative

Alternative 3 would incorporate modifications and mitigating measures proposed by the agencies to reduce or eliminate adverse environmental impacts. These measures are in addition to or instead of the mitigations proposed by MMC. The Libby Adit evaluation program would be the initial phase of the project and would be completed before construction of any other project facility. All other aspects of MMC's mine proposal would remain as described in Alternative 2.

In Alternative 3, four major mine facilities would be located in alternative locations (Figure S-2). MMC would develop a Poorman Tailings Impoundment Site north of Poorman Creek for tailings disposal, use the Libby Plant Site between Libby and Ramsey creeks, construct two additional adits in upper Libby Creek, and modify the proposed operating permit and disturbance areas at LAD Areas 1 and 2 to avoid important resources (Figure S-3). The Poorman Tailings Impoundment Site was retained for detailed analysis because it would avoid the diversion of a perennial stream (Issue 2) and minimize wetland effects (Issue 7). In Alternative 2, MMC's proposed tailings impoundment would be in Little Cherry Creek, a perennial stream, and the impoundment would require the permanent diversion of the upper watershed of Little Cherry Creek. Numerous wetlands and springs are in the Little Cherry Creek Impoundment Site.

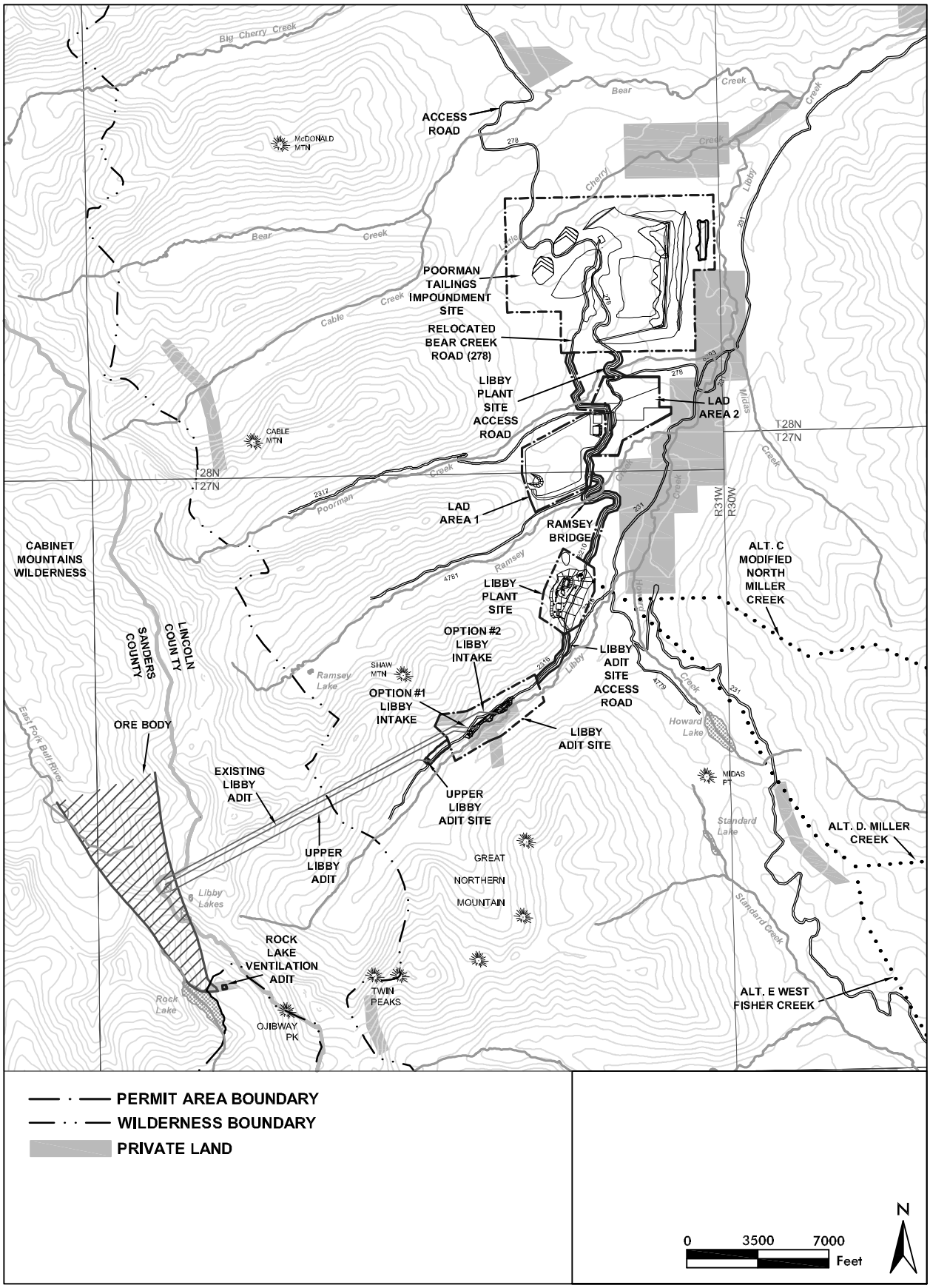


Figure S-2. Mine Facilities and Permit Areas, Alternative 3

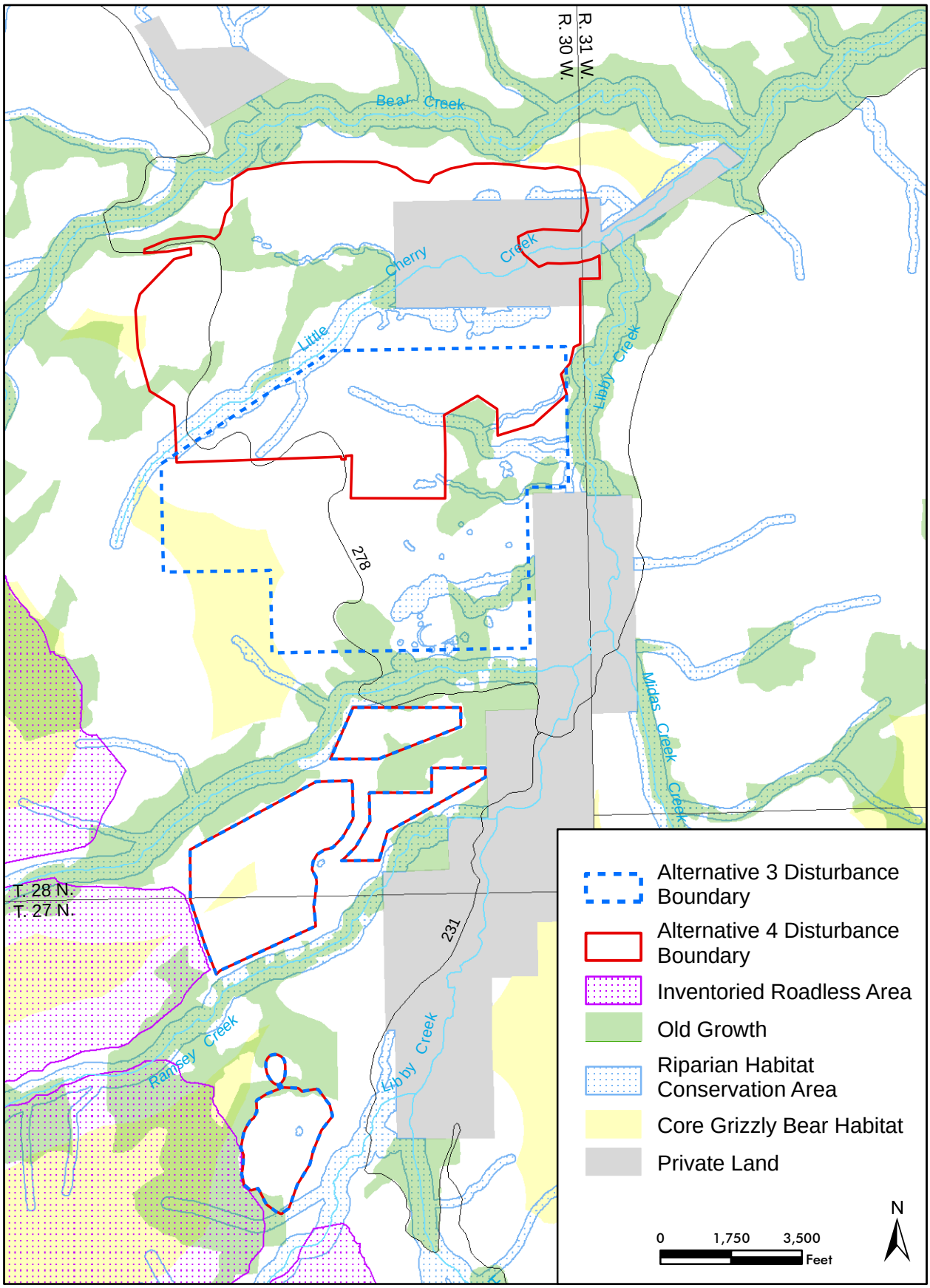


Figure S-3. Key Resources Avoided by Alternatives 3 and 4

MMC's proposed plant site in the upper Ramsey Creek drainage would affect Riparian Habitat Conservation Areas (RHCAs) (Issue 3), core grizzly bear habitat (Issue 5), and Inventoried Roadless Areas (IRAs). An alternative site on a ridge separating Libby and Ramsey creeks was retained for detailed analysis to address these issues. Preliminary evaluation indicates the Libby Plant Site could be built of fill material from the large cut on the west side of the plant site. The cut and fill materials would be balanced, and waste rock would not be used in plant site construction. Avoiding the use of waste rock in plant site construction would address acid rock drainage and metal leaching (Issue 1). To avoid disturbance in the upper Ramsey Creek drainage, the adits in Alternative 3 would be in the upper Libby Creek drainage. This modification would address the same issues as the alternate Libby Plant Site (Issues 3 and 5).

MMC's proposed LAD Area 1 would disturb RHCAs (Issue 3), old growth (Issue 6), and IRAs; LAD Area 2 would disturb old growth. In Alternative 3, the lead agencies modified the permit areas and disturbance areas for the LAD Areas to address these issues (Figure S-3).

In Alternative 2, MMC would discharge mine and adit wastewater from the Ramsey Adits at two LAD Areas. Water would be treated at the Libby Water Treatment Plant or a water treatment plant at the Ramsey Plant Site if necessary to meet MPDES discharge limitations. In Alternatives 3 and 4, the lead agencies modified the proposed water management plan to address the uncertainties about quality of the mine and adit inflows, the effectiveness of LAD for primary treatment, quantity of water that the LAD Areas would be capable of receiving and the effect on surface and ground water quality. In Alternatives 3 and 4, in addition to the existing water treatment plant at the Libby Adit, another water treatment system may be necessary at higher wastewater volumes to comply with water quality standards or BHES Order limits prior to disposal at the LAD Areas. These modifications would address Issue 2, water quality and quantity.

The operating permit area would be 2,606 acres and the disturbance area would be 2,011 acres (Table S-1). The operating permit area would encompass 83 acres of private land owned by MMC for the proposed mine and associated facilities.

MMC would plow the Libby Creek Road (NFS road #231) and the Upper Libby Creek Road (NFS road #2316) year-round during the 2-year evaluation program and the 1-year period during reconstruction of the Bear Creek Road. MMC would install a gate on the Libby Creek Road and maintain the gate and the KNF would seasonally restrict access on the two roads as long as MMC uses and snowplows the two roads.

In Alternative 3, MMC would use the same roads as Alternative 2 for main access during operations. About 13 miles of Bear Creek Road (National Forest System road #278), from U.S. 2 to the Poorman Tailings Impoundment Site, would be paved and upgraded to a roadway width of 26 feet. South of Little Cherry Creek, MMC would build 3.2 miles of new road west of Bear Creek Road that would connect Bear Creek Road with Ramsey Creek Road (NFS road #4781). The new road would be designated NFS road #278 (the new Bear Creek Road) and would generally follow the 3,800-foot contour to north of the Poorman Creek bridge. To maintain a public access connection between the Bear Creek Road and the Libby Creek Road (NFS road #231), the public would use the new Bear Creek Road, a segment of the Poorman Creek Road (NFS road #2317), and a segment of the Bear Creek Road south of Poorman Creek.

Alternative 4—Agency Mitigated Little Cherry Creek Impoundment Alternative

Alternative 4 would be similar to Alternative 3, but would have modifications to MMC's proposed Little Cherry Creek Tailings Impoundment as part of the alternative. All other modifications and mitigations described in Alternative 3, other than those associated with the Poorman Tailings Impoundment Site, would be part of Alternative 4. As in Alternative 3, the Libby Adit evaluation program would be the initial phase of the project and would be completed before construction of any other project facility.

In Alternative 4, MMC would use the Libby Plant Site between Libby and Ramsey creeks, construct two additional adits in upper Libby Creek, and modify the proposed permit and disturbance areas at the LAD Areas, as in Alternative 3 (Figure S-4). In addition to the modifications from Alternative 3, MMC would modify the proposed Little Cherry Creek Tailings Impoundment Site operating permit and disturbance areas to avoid RHCAs (Issue 3) and old growth (Issue 6) in the Little Cherry Creek drainage. Borrow areas would be reconfigured to maximize disturbance within the impoundment footprint, and to minimize disturbance of RHCAs (Issue 3), core grizzly bear habitat (Issue 5), and old growth (Issue 6) (Figure S-3). Waste rock would be stored temporarily within the impoundment footprint to address acid rock drainage and metal leaching (Issue 1) and water quality and quantity (Issue 2). The proposed permanent Little Cherry Creek Diversion Channel below the engineered upper section would be modified so it would adequately convey anticipated flows. At closure, surface water runoff would be directed toward the Little Cherry Creek Diversion Channel, and not Bear Creek, an important bull trout stream. The operating permit area would be 3,245 acres and the disturbance area would be 2,254 acres (Table S-1). The operating permit area would encompass 433 acres of private land owned by MMC for the proposed mine and associated facilities. All other aspects of MMC's mine proposal would remain as described in Alternative 2, as modified by Alternative 3.

A comparison of primary mine development and operation features that vary between each mine alternative is shown in Table S-2.

Transmission Line Alternatives

Alternative A—No Transmission Line, No Mine

In this alternative, MMC would not build a 230-kV transmission line to provide power. The BPA would not tap the Noxon-Libby 230-kV transmission line nor would it build the Sedlak Park Substation. The environmental, social, and economic conditions described in Chapter 3 would continue, unaffected by the construction and operation of the transmission line. The DEQ's approval of the mine, as permitted by DEQ Operating Permit #00150, would remain in effect. The DEQ's approval of revisions to DEQ Operating Permit #00150 (Minor Revisions 06-001 and 06-002) also would remain in effect. MMC could continue with the permitted activities on private land associated with the Libby Adit evaluation program that do not affect National Forest System lands.

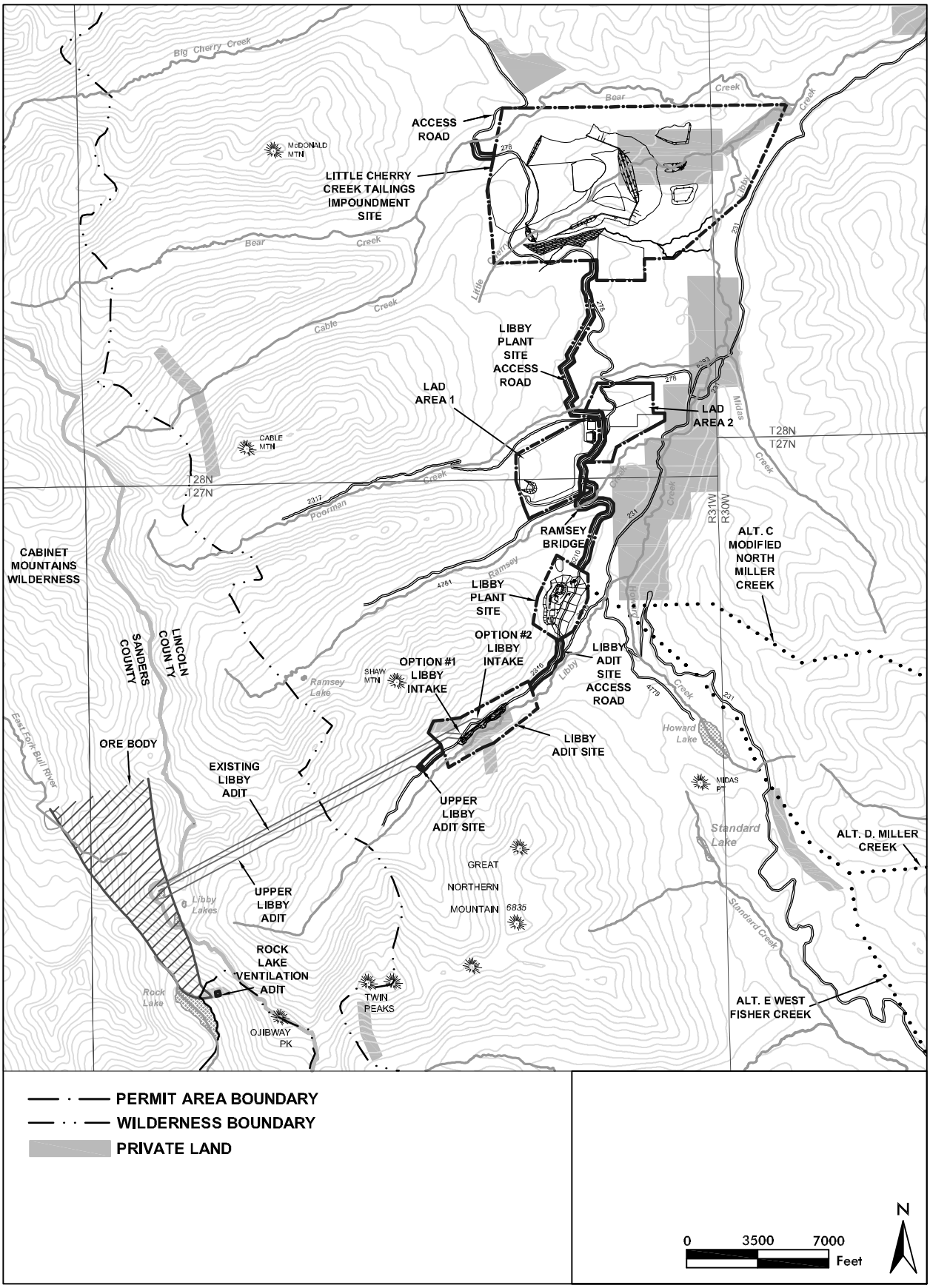


Figure S-4. Mine Facilities and Permit Areas, Alternative 4

Table S-2. Mine Alternative Comparison.

Project Facility or Feature	Alternative 2 MMC's Proposed Mine	Alternative 3 Agency Mitigated Poorman Impoundment Alternative	Alternative 4 Agency Mitigated Little Cherry Creek Impoundment Alternative
Operating Permit Areas	3,628 acres	2,606 acres	3,245 acres
Disturbance Areas	2,582 acres	2,011 acres	2,254 acres
Primary Facilities			
Mill site	Ramsey Plant Site in valley bottom in Upper Ramsey Creek	Libby Plant Site between Libby and Ramsey Creek drainages	Same as Alternative 3
Adits and portals	Existing Libby Adit; two Ramsey Adits; Rock Lake Ventilation Adit	Existing Libby Adit; two additional Libby Adits; Rock Lake Ventilation Adit	Same as Alternative 3
Above-ground conveyor	1,200 feet long between Ramsey Adit portal and mill	6,000 and 7,500 feet long (depending on the option) between Libby Adit Site and Libby Plant Site mill	Same as Alternative 3
Tailings impound-ment and seepage collection pond	628 acres in Little Cherry Creek	608 acres between Poorman and Little Cherry creeks	Same as Alternative 2
Perennial stream diversion	Diversion of Little Cherry Creek 10,800 feet long around impoundment to Libby Creek	None	Same as Alternative 2
Land application disposal areas	Two; one along Ramsey Creek and one between Ramsey and Poorman creeks	Two; similar to Alternative 2 with slight boundary modifications	Same as Alternative 3
Water treatment	Land application, Libby Adit Water Treatment Plant, or additional water treatment plant at plant site, as necessary	Same as Alternative 2	Same as Alternative 2

Project Facility or Feature	Alternative 2 MMC's Proposed Mine	Alternative 3 Agency Mitigated Poorman Impoundment Alternative	Alternative 4 Agency Mitigated Little Cherry Creek Impoundment Alternative
Primary access road	NFS road #278 (Bear Creek Road) plus new access road; 20 to 29 feet wide	NFS road #278 (Bear Creek Road) plus new access road; 26 feet wide; up to 56 feet wide to accommodate haul traffic and public traffic	Same as Alternative 3
Concentrate loadout location	Kootenai Business Park in Libby	Same as Alternative 2	Same as Alternative 2
Facility Details			
New adits:length, grade, and portal elevation	Ramsey Adits: 16,000 feet long, 8% decline; Elevation: 4,400 feet Rock Lake Ventilation Adit: Elevation: 5,560 feet	Upper Libby Adit: 13,700 feet long, 7% decline; Elevation: 4,100 feet New Libby Adit: 17,000 to 18,500 feet long, depending on option; 5% decline; Elevation: 3,960 feet	Same as Alternative 3
New access roads[†] To Plant Site:	1.7 miles connecting NFS roads #278 and #4781	Existing NFS road #6212 and 4781 used for plant site access	Same as Alternative 2
Realigned NFS road #278 at impoundment	1.8 miles	3.2 miles of new Bear Creek Road connecting existing NFS roads #278 and #4781	Same as Alternative 2
To Adit Portal:	0.3 mile to portal	None	Same as Alternative 3
To LAD Area 1	1.0 mile	0.7 mile	Same as Alternative 3
To LAD Area 2	0.2 mile	0.2 mile	Same as Alternative 3
Pipelines Tailings	Double-walled, high-density polyethylene adjacent to access road; 6.4 miles to impoundment	Double-walled buried adjacent to access road; 4.2 miles to impoundment	Same as Alternative 3; 6.4 miles to impoundment
Reclaim water	High-density polyethylene adjacent to access road	High-density polyethylene buried adjacent to access road	Same as Alternative 3
Tailings pump stations	At Poorman Creek crossing	At each crossing of Ramsey and Poorman creeks	Same as Alternative 3

Project Facility or Feature	Alternative 2 MMC's Proposed Mine	Alternative 3 Agency Mitigated Poorman Impoundment Alternative	Alternative 4 Agency Mitigated Little Cherry Creek Impoundment Alternative
Borrow areas	Four; 143 acres within impoundment footprint and 419 acres outside of impoundment footprint	Three; 124 acres within impoundment footprint and 92 acres outside of impoundment footprint	Five; 185 acres within impoundment footprint and 252 acres outside of impoundment footprint
Post-mining impoundment runoff	Riprapped channel to Bear Creek	Natural channel to Little Cherry Creek	Riprapped channel to Little Cherry Creek Diversion Channel

[†]Temporary roads within the disturbance area of each facility not listed.

Alternative B—MMC's Proposed Transmission Line (North Miller Creek Alternative)

The Ramsey Plant Site's electrical service would be 230-kV, 3-phase, and 60-cycle, provided by a new, overhead transmission line. BPA's proposed Sedlak Park Substation Site at the Noxon-Libby 230-kV transmission line is in an area known locally as Sedlak Park, 30 miles southeast of Libby on U.S. 2 (Figure S-5). The proposed Sedlak Park Substation Site is the same in all alternatives. MMC would be responsible for funding construction of the transmission line, substation, and loop line that would connect the substation to the Noxon-Libby 230-kV transmission line.

MMC's proposed transmission line alignment would be in the watersheds of the Fisher River, Miller Creek, a tributary to Miller Creek, Midas Creek, Howard Creek, Libby Creek, and Ramsey Creek (Figure S-5). The proposed alignment would head northwest from the substation for about 1 mile paralleling U.S. 2, and then follow the Fisher River and U.S. 2 north 3.3 miles. The alignment would then turn west and generally follow the Miller Creek drainage for 2.5 miles, and then turn northwest and traverse up a tributary to Miller Creek. The alignment would then cross into the upper Midas Creek drainage, and then down to Howard and Libby Creek drainages. The alignment would cross the low ridge between Libby Creek and Ramsey Creek, and then would generally follow Ramsey Creek to the Ramsey Plant Site. The maximum annual energy consumed by the project is estimated at 406,000 megawatts, using a peak demand of 50 megawatts. Access roads on National Forest System lands would be closed and reseeded after the transmission line was built, and reclaimed after the transmission line was removed at the end of operations.

Characteristics of MMC's proposed North Miller Creek Alternative (Alternative B) and the agencies' three other transmission line alternatives (Alternatives C, D, and E) are summarized in Table S-3. MMC's proposed alignment would end at a substation at the Ramsey Plant Site; the lead agencies' alternatives would end at a substation at the Libby Plant Site, which would result in the lead agencies' alternatives being shorter.

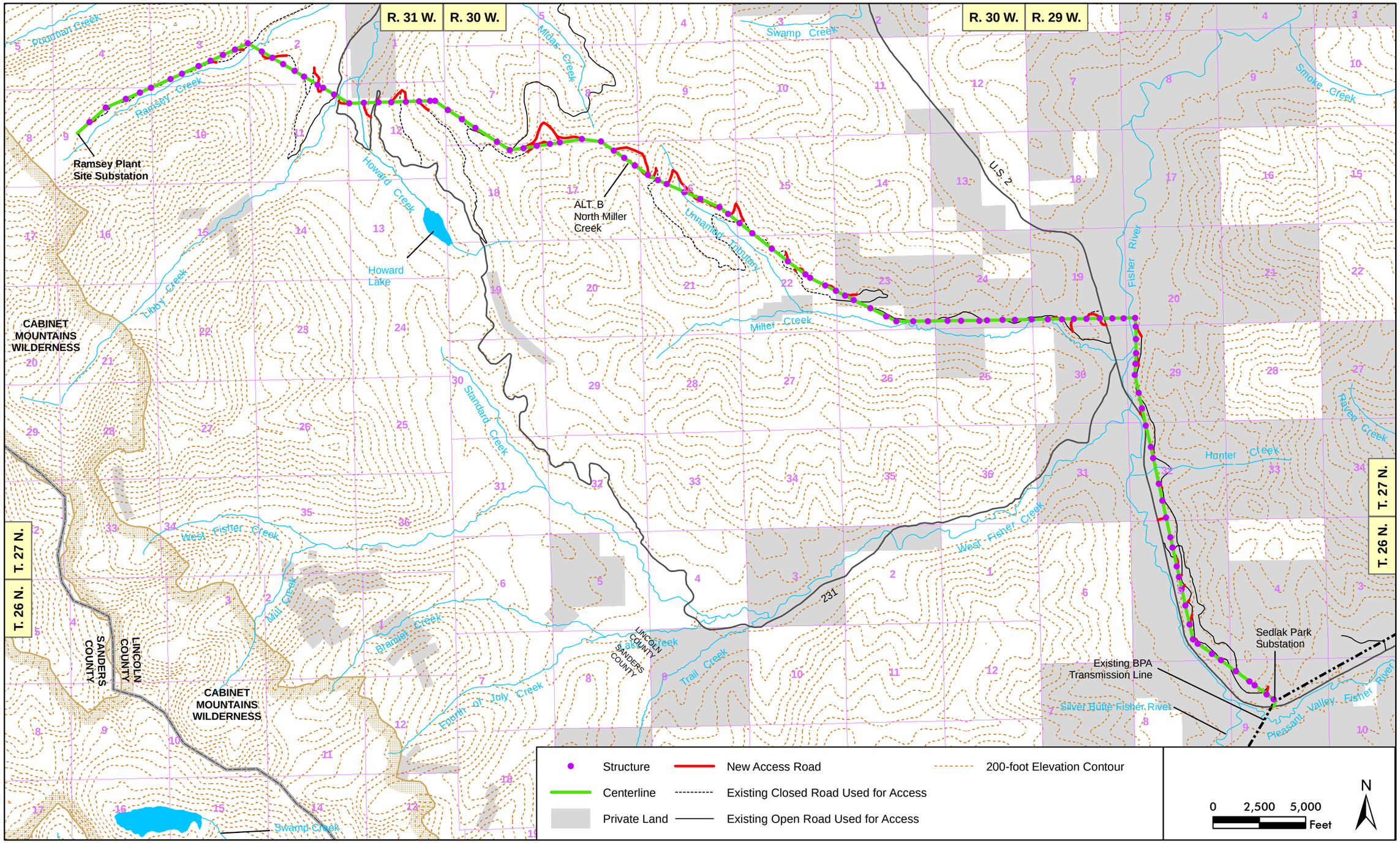


Figure S-5. North Miller Creek Alignment, Structures, and Access Roads, Alternative B

Table S-3. Transmission Line Alternative Comparison.

Characteristic	Alternative B – North Miller Creek	Alternative C – Modified North Miller Creek	Alternative D – Miller Creek	Alternative E – West Fisher Creek
Length (miles)[†]				
Steel monopole	16.4	0.0	0.0	1.4
Wooden H-frame	0.0	13.4	14.1	13.5
Total	16.4	13.4	14.1	14.9
Number of structures[‡]	108	80	95	101
Approximate average span length (ft)	800	885	785	780
Helicopter use				
Structure placement	At contractor's discretion	21 structures, primarily in upper unamed tributary of Miller Creek and Midas Creek	20 structures, primarily in upper Miller Creek	23 structures, primarily along West Fisher Creek
Vegetation clearing	At contractor's discretion	At selected locations; see Figure S-6	At selected locations; see Figure S-6	At selected locations; see Figure S-6
Line stringing	At contractor's discretion	Yes, entire line	Yes, entire line	Yes, entire line
Annual inspection	Yes	Yes	Yes	Yes
Estimated cost in millions of 2008 $[¶]				
Construction	$7.3	$5.4	$5.8	$6.0
Mitigation	$14.9	$14.4	$14.5	$15.0

[†]Length is based on line termination at the Ramsey Plant Site in Alternative B and the Libby Plant Site in the other three alternatives.
[‡]Number and location of structures based on preliminary design, and may change during final design. The lead agencies' analysis of MMC's preliminary design and structure locations indicates additional structures and access may be needed to avoid long spans.
[¶]Estimated cost used reasonable assumptions regarding costs of construction materials, clearing, land acquisition, and engineering. Final cost could vary from those shown. Estimated construction cost by HDR Engineering, Inc. 2008; estimated construction cost by ERO Resources Corp. 2008.

Alternative C—Modified North Miller Creek Transmission Line Alternative

This alternative includes modifications to MMC's transmission line proposal described under Alternative B. This alternative could be selected with any of the mine alternatives. For analysis purposes, this alternative would terminate at the Libby Plant Site.

The primary modification to MMC's proposed North Miller Creek alignment in Alternative B would be routing the line on an east-facing ridge immediately north of the Sedlak Park Substation instead of following the Fisher River (Figure S-6). This modification would address issues associated with water quality and aquatic life (Issues 2 and 3) by crossing less area with soils that are highly erosive and subject to high sediment delivery. The alignment also would be out of the Fisher River floodplain. The issue of scenic quality (Issue 4) was addressed by this modification by reducing the visibility of the line from U.S. 2. Fewer residences would be within 0.5 mile of the line. Other modifications to the alignment are relatively small shifts along Miller Creek and an unnamed tributary to Miller Creek. During final design, MMC would submit a final Vegetation Removal and Disposition Plan for lead agencies' approval. The plan's goal would be to minimize vegetation clearing. The modifications were made to avoid and minimize effects on RHCAs along drainages, and to avoid steep slopes in the headwaters of the unnamed tributary of Miller Creek (Issues 2 and 3).

Wooden H-frame structures, which generally allow for longer spans and require fewer structures and access roads, would be used on Alternative C. In some locations, a helicopter would be used for vegetation clearing and structure construction (Figure S-6). The lead agencies selected helicopter use so the need to use or construct roads in or adjacent to core grizzly bear habitat was eliminated. Helicopter use also would reduce effects on lynx habitat. Access roads on National Forest System lands would be placed into intermittent stored service after construction, and decommissioned after the transmission line was removed at the end of operations. These modifications would address issues associated with water quality, aquatic life, threatened and endangered species, and wildlife (Issues 2, 3, 5, and 6) by reducing clearing and wildlife displacement associated with new access roads. Modifications described under Alternative 3 for the mine, such as seed mixtures, revegetation success, and weed control, would be implemented in Alternative C.

The agencies developed mitigation measures that would reduce or minimize the effects of the transmission line in Alternatives C, D, and E. Snags and up to 30 tons per acre of coarse woody debris would be left in the clearing area. No transmission line construction in elk, white-tailed deer, or moose winter range would occur between December 1 and April 30 unless approved by the agencies. The KNF would change the access on five roads to provide big game security habitat. MMC would fund or conduct field and/or aerial reconnaissance surveys to locate any new bald eagle or osprey nests along specific segments of the transmission line corridor. MMC would complete surveys to locate active nests in appropriate habitat, or would not remove vegetation in the nesting season. To mitigate effects on the grizzly bear, MMC would secure or protect replacement grizzly bear habitat on 24 acres of private lands and enhance grizzly bear habitat on 11,324 acres of private lands in the Cabinet-Yaak Ecosystem. The KNF would change the access in 2.8 miles of NFS road #4725 in an unnamed tributary of Miller Creek in Alternative C and 4.2 miles in Alternatives D and E.

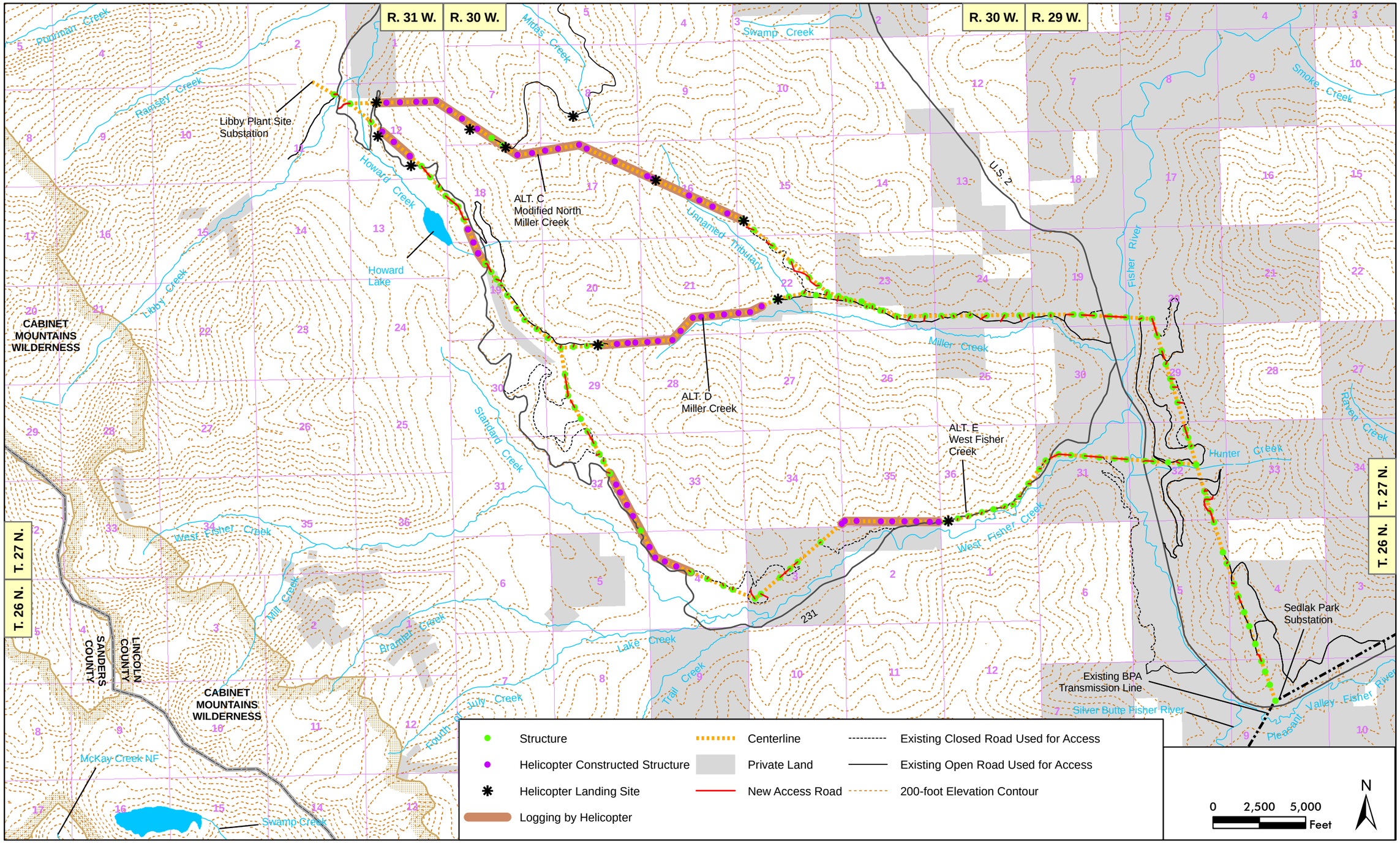


Figure S-6. Transmission Line Alignment, Structures, and Access Roads, Alternatives C-E

Alternative D—Miller Creek Transmission Line Alternative

This alternative includes modifications to MMC's transmission line proposal regarding H-frame structures, helicopter use, vegetation clearing, and other modifications described under Alternative C. This alternative could be selected with any of the mine alternatives. For analysis purposes, this alternative would terminate at the Libby Plant Site.

As in the Modified North Miller Creek Alternative (Alternative C), this alternative modifies MMC's proposed North Miller Creek alignment by routing the line on an east-facing ridge immediately north of the Sedlak Park Substation (Figure S-6). The development of a final Vegetation Removal and Disposition Plan would be the same as Alternative C. The modifications would address issues associated with water quality and aquatic life (Issues 2 and 3) by crossing less area with soils that are highly erosive and subject to high sediment delivery. The issue of scenic quality (Issue 4) was addressed by this modification by reducing the visibility of the line from U.S. 2. Fewer residences would be within 0.5 mile of the line. Other modifications to the alignment are relatively small shifts along Miller Creek to avoid RHCAs along drainages (Issue 3). The issue of effects on threatened or endangered species (Issue 5) was addressed by routing the alignment along Miller Creek and avoiding core grizzly bear and lynx habitat in North Miller Creek and the unnamed tributary of Miller Creek.

This alternative would use an alignment about 0.5 mile east of Howard Lake, a popular recreation facility in the project area. In the 1992 Final EIS, a similar alignment was considered, but was eliminated in part because of visual concerns from Howard Lake. The issue of scenic quality from Howard Lake was addressed by using H-frame structures, which would be shorter than steel monopoles. More detailed engineering was completed and H-frame structures would be used to minimize the visibility of the line from Howard Lake (Issue 4).

As in Alternative C, a helicopter would be used for timber clearing and structure construction in some locations (Figure S-6). New access roads on National Forest System lands would be managed in the same manner as Alternative C. These modifications would address issues associated with water quality, aquatic life, threatened and endangered species, and wildlife (Issues 2, 3, 5, and 6) by reducing clearing and wildlife displacement associated with new access roads.

Alternative E—West Fisher Creek Transmission Line Alternative

This alternative includes modifications to MMC's transmission line proposal regarding H-frame structures, helicopter use, vegetation clearing, and other modifications described under Alternative C. Some steel monopoles would be used in the steep section 2 miles west of U.S. 2 (Figure S-6). This alternative could be selected with any of the mine alternatives. For analysis purposes, the lead agencies assumed this alternative would terminate at the Libby Plant Site.

As in the Modified North Miller Creek Alternative, this alternative modifies MMC's proposed North Miller Creek Alignment by routing the line on an east-facing ridge immediately north of the Sedlak Park Substation. The modification would address issues associated with water quality (Issue 2) by crossing less area with soils that are highly erosive and subject to high sediment delivery. The issue of scenic quality (Issue 4) was addressed by this modification by reducing the visibility of the line from U.S. 2. Fewer residences would be within 0.5 mile of the line.

The primary difference between the West Fisher Creek Alternative (Alternative E) and the North Miller Creek Alternative (Alternative B) is routing the line on the north side of West Fisher Creek

and not up the Miller Creek drainage to minimize effects on core grizzly bear habitat. As in the Miller Creek Alternative (Alternative D), this alternative would use an alignment about 0.5 mile east of Howard Lake, a popular recreation facility in the project area. Wooden H-frame structures, which generally allow for longer spans and require fewer structures and access roads, would be used on this alternative in most locations to minimize the visibility of the line from Howard Lake (Issue 4). In some locations, a helicopter would be used for timber clearing and structure construction (Figure S-6). New access roads on National Forest System lands would be managed in the same manner as Alternative C. These modifications would address issues associated with water quality, aquatic life, threatened and endangered species, and wildlife (Issues 2, 3, 5, and 6) by reducing clearing and wildlife displacement associated with new access roads.

Forest Plan Amendment

Each mine and transmission line alternative would require an amendment to the 1987 Kootenai Land and Resource Management Plan, as known as the Kootenai Forest Plan (KFP) in order for the alternative to be consistent with the plan (USDA Forest Service 1987). The amendment would be completed in accordance with the regulations governing Forest Plan amendments found in 36 CFR 219 and Forest Service Manual 1921.03.

Mine Facilities

In the 1993 ROD approving the lead agencies' preferred alternative for Noranda's proposed Montanore Project, the KNF amended the KFP and reallocated an area surrounding the Little Cherry Creek Tailings Impoundment Site and the Ramsey Plant Site to Management Area 31 (MA 31). Maps showing existing MAs are available at the KNF. MA 31 is designed to accommodate the activities associated with mineral development on the KNF. Because of improved mapping capabilities between 1993 and 2007 and a slight change in the Little Cherry Creek Tailings Impoundment design from that approved in 1993, all areas currently proposed for disturbance at the Ramsey Plant Site and the Little Cherry Creek Tailings Impoundment Site were not previously reallocated to MA 31. In mine Alternatives 2, 3 and 4, the KNF would amend the KFP by reallocating to MA 31 all areas within the operating permit areas of the selected plant site, the tailings impoundment, and LAD Areas 1 and 2 that currently are not MA 31. In addition, a proposed road and facility corridor that would cross MA 13 (Designated Old Growth) would be reallocated to MA 31. This amendment would apply only to National Forest System lands disturbed by any mine alternative, and would not apply to private lands affected by the mine alternatives.

230-kV Transmission Line

In the 1993 ROD approving the lead agencies' preferred alternative for Noranda's proposed Montanore Project, the KNF amended the KFP and reallocated areas crossed by the transmission line classified as corridor avoidance areas (224 acres) to Management Area 23 (MA 23). Maps showing existing MAs are available at the KNF. MA 23 is designed to accommodate the activities associated with electric transmission corridors on the KNF (USDA Forest Service 1987). Because of improved mapping capabilities between 1993 and 2007 and slight changes in the North Miller Creek transmission line alignment from that approved in 1993, all areas currently proposed for disturbance by MMC's proposed transmission line alignment classified as corridor avoidance areas were not reallocated to MA 23. In transmission line Alternatives B, C, D, and E, the KNF would amend the KFP by reallocating certain areas within a 500-foot corridor of the selected 230-

kV transmission line on National Forest System lands as MA 23. This amendment would apply only to certain National Forest System lands currently not MA 23 disturbed by any transmission line alternative, and would not apply to private lands crossed by the transmission line alternatives. The amendment would apply to the following MAs if crossed by the transmission line under the conditions described:

- MAs 10 and 11 if the proposed corridor is within grizzly bear Management Situation 1 or 2
- MAs 2, 6, 12, 13, and 14

The KFP requires wildlife habitat and security be maintained in MAs 15, 16, 17, and 18 by limiting open road density (ORD) to less than or equal to 3.0 miles per square mile. ORD in MAs 15, 16, 17, and 18 is currently greater than the standard in the Crazy Planning Subunit (PSU), which is a KNF planning area potentially affected by the proposed project. In transmission line Alternatives B, C, D, and E, the KNF would amend the KFP by allowing the ORD to exceed the KFP standard in the Crazy PSU during and after the project.

Affected Environment

The project is in the KNF, 18 miles south of Libby, Montana. Elevation of the project area ranges from 2,600 feet along U.S. 2 to nearly 8,000 feet in the Cabinet Mountains. Most of the area is forested. Annual precipitation varies over the area, and is influenced by elevation and topography. Precipitation is between 30 and 50 inches where most project facilities would be located. Two tributaries of the Kootenai River, Libby Creek and the Fisher River, provide surface water drainage for most of the project area. The ore body is beneath the CMW and all access and surface facilities would be located outside of the CMW boundary. The analysis area is drained by East Fork Rock Creek, a tributary of the Clark Fork River, the East Fork Bull River, Libby Creek, and tributaries to the Fisher River. Most of the area is National Forest System lands managed in accordance with the KFP. Private land, most of which is owned by MMC or Plum Creek Timber Company, is found in the project area, particularly along the first 3 to 6 miles of the transmission line corridors. Recreation, wildlife habitat, and timber harvesting are the predominant land uses. Chapter 3 provides more information about the affected environment.

Environmental Consequences

The following two sections summarize the environmental consequences of the four mine and five transmission line alternatives. The effects of the mine alternatives are summarized for the seven key issues discussed in the previous *Public Involvement* section. For the transmission line, the DEQ requires a certificate of compliance for development of electric transmission lines. The DEQ must find that the selected alternative meets the set of criteria listed under 75-20-301, MCA to be eligible for transmission line certification. Findings for all criteria under each alternative are summarized in the following *Draft Findings for Transmission Line Certification Approval* section.

Mine Alternatives

Issue 1: Potential for Acid Rock Drainage and Near Neutral pH Metal Leaching

The mineral deposit proposed for mining is part of the Rock Creek-Montanore deposit. The Rock Creek-Montanore deposit has two sub-deposits, the Rock Lake sub-deposit and the Montanore sub-deposit. The Troy Mine, developed within the upper quartzites of the Revett Formation, is a depositional and mineralogical analog for the zone of quartzite to be mined within the upper-most part of the lower Revett Formation at the Montanore sub-deposit. Geological analogs are valuable techniques for predicting acid generation potential and/or water quality from a proposed mine site. This type of comparison is based on the assumption that mineralization formed under comparable conditions within the same geological formation, and that has undergone similar geological alteration and deformation, will have similar mineralogy and texture and, thus, similar potential for oxidation and leaching under comparable weathering conditions. The ability to study environmental geochemical processes in the same rocks at full scale and under real-time weathering conditions provides a valuable basis for evaluation of laboratory test results.

The risk of acid generation for rock exposed in underground workings or for tailings would be low, with some potential for release of select metals at a near-neutral pH (around pH 7) and a high potential for release of nitrogen compounds due to blasting. Low acid generation potential exists for a fraction of the total waste rock volume in portions of the Prichard Formation and moderate potential exists within the halo zones of the Revett Formation, which MMC proposes to mitigate through selective handling (particularly of the barren lead zone) and additional evaluation by sampling and characterization during mine development and operations. Portions of the waste rock at Montanore have the potential to release trace elements at a near-neutral pH.

Some additional sampling would be conducted during final exploration and operations, when a more representative section of waste rock would be available for sampling. Characterization of metal release potential for tailings and waste rock is limited and would be expanded in Alternatives 3 and 4. Descriptions of mineralogy in rocks exposed in the evaluation adit ore zone (for the Revett Formation) and development adits (for the Burke and Prichard Formations) would be used to identify subpopulations with sulfide halo zone overprints and their relative importance in terms of tonnage to be mined, to guide sampling density. If the Wallace Formation were intercepted, samples of this lithology would be collected and characterized. This information would be used to redefine geochemical units for characterization and evaluate potential selective handling and encapsulation requirements.

Although waste rock would only be stockpiled for a short period of time near LAD Area 1 in Alternative 2, and runoff from that pile would only be contained using stormwater controls, waste rock would be used throughout the site for construction purposes, using selective handling criteria that are not yet defined. It is therefore not clear which fraction of the Revett Formation waste rock would be brought to the surface. Once more detailed information about the Revett and Prichard Formations waste rock is available, along with updated predictions of metal loading for tailings, these source terms would be incorporated into updated mass load calculations.

Issue 2: Quality and Quantity of Surface and Ground Water Resources

Ground Water Levels-Mine Area. The No Mine alternative would not change ground water levels. Disturbances at the Libby Adit Site would remain until reclaimed in accordance with existing permits and approvals.

The agencies used a two-dimensional model to perform an analysis of the effects to mine area hydrology. A two-dimensional model was used because there were insufficient site data to support a three-dimensional model. The model required a number of simplifying assumptions described in section 3.10, *Ground Water Hydrology* section of Chapter 3.

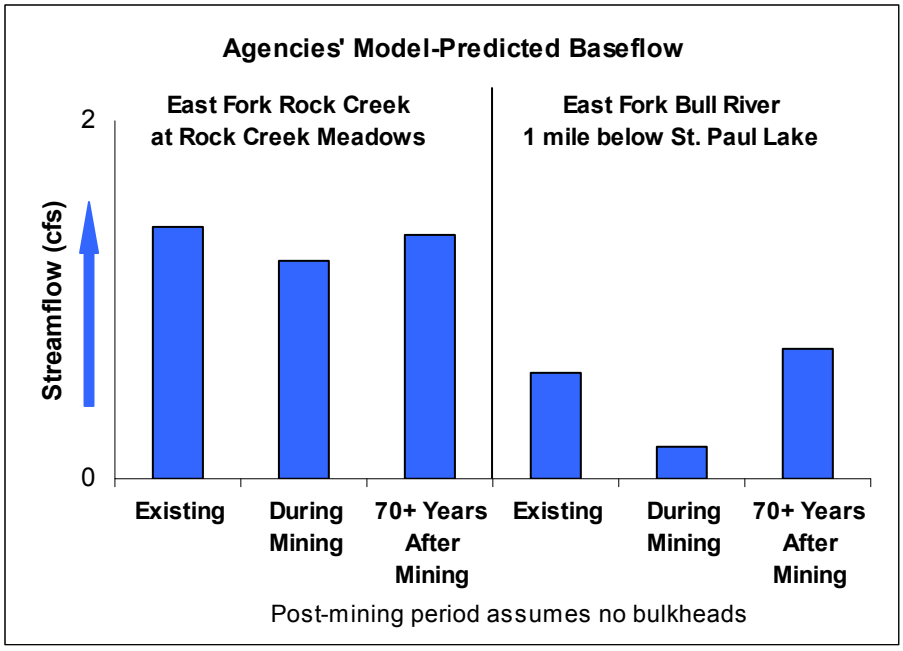
Based on the agencies' model, drawdown due to mine dewatering in Alternatives 2, 3, and 4 is predicted to extend about 2 miles from the mine void in all directions, but along the trend of the proposed adits, drawdown created by the mine void would merge with drawdown created by the adits. Given uncertainties associated with the model, the model cannot precisely predict the final configuration of the drawdown cone around the mine, but the model does provide an indication of the catchment area required to supply about 450 gallons per minute (gpm) to the mine and adits on a steady state basis. If steady state inflow to the mine were higher, a larger catchment would be required to supply that water at the calibrated infiltration rates and hydraulic conductivity. For example, if the steady state inflow were in the range of 800 gpm, as estimated by MMC, the catchment area would be about two times larger than predicted by the agencies' numerical ground water model (using the assumptions inherent in the calibrated version of the model).

An uncertainty in the final shape of the drawdown cone is the assumption in the agencies' numerical model that homogeneous conditions exist in the mine area. As a result of this assumption, the numerical model essentially distributes potential impacts from mine dewatering evenly in all directions. Actual site conditions may vary and ground water drawdown may be subject to some degree of heterogeneity, causing more drawdown along structural trends and less drawdown in other directions. Data are insufficient for the model to predict heterogeneous drawdown.

For those areas where the fractured bedrock water table is currently some depth below ground surface (for all areas above 5,600 feet elevation), ground water drawdown, as predicted by the agencies' numerical model, would not have a direct effect on surface water occurring above this elevation. Because surface and ground water above 5,600 feet elevation appear not to be hydraulically connected, ground water drawdown would not decrease flow to surface water (streams, springs and lakes) in areas above 5,600 feet elevation. Infiltration of precipitation is controlled by the nature of the surface material and overall hydraulic conductivity and, therefore, the infiltration rate would not change in these areas as a result of a lower water table. It is possible that random fractures exist above elevations of 5,600 feet that are saturated between the fractured bedrock water table and the shallow ground water flow path, hydraulically connecting the two ground water flow paths. If this condition were to exist, drawdown of the fractured bedrock water table by mine dewatering could reduce flow to unidentified springs or affect lake levels associated with this type of fracture, such as the Libby Lakes. However, there are no observations, data or numerical model results to indicate this condition exists.

For those areas where ground water is either at the surface or connected hydraulically to shallow ground water flow systems (below an elevation of about 5,600 feet), drawdown due to mine dewatering would decrease the volume of water available to the surface water system, such as springs, lakes, and creeks. The effects of ground water drawdown due to dewatering of the mine

can best be expressed by estimating changes to base flow in streams. Streams in the area flow at base flow for about 1 to 2 months between mid-July to early October; periods of base flow may also occur during November through March. The agencies' model predicts base flow would be reduced in East Fork Rock Creek, East Fork Bull River and Libby Creek in Alternatives 2, 3, and 4, and Ramsey Creek in Alternative 2.



The agencies estimate the area overlying the mine would require slightly more than 20 years to recover to steady state water level conditions after the mine void was filled with water. Based on an estimated inflow rate of about 450 gpm and estimated volume of the final mine void, the mine void would require about 50 years to refill. Ground water levels above the mine void are predicted to return to steady-state conditions about 70 years following mine closure and plugging of the portals. While water levels were recovering, the ground water flow direction in the region would be predominantly toward the mine void and adits and any change in base flow to streams would occur for much of this recovery period. Any change in ground water contribution to streams would decrease through the recovery period as the ground water head in the mine void increased and flow toward the mine void decreased. If necessary, one or more bulkheads would be installed in the mine to minimize post-mining effects to the East Fork Bull River and East Fork Rock Creek streamflow.

Ground Water Quality-Mine Area. The No Mine alternative would not change ground water quality in the mine area. During the mining period, the risk of measurable changes to ground water quality would be low in Alternatives 2, 3, and 4 because ground water would be moving toward the mine void and adits and then pumped to the surface for use in the ore processing. Any changes in water quality resulting from the mining process, such as an increase in the concentration of nitrogen compounds due to the use of explosives and ground water contact with oxidizing minerals in the ore body, would be removed from the mine void, used in mill processing, and eventually stored, treated, and discharged. Mine dewatering and the resulting drawdown of bedrock ground water could subtlely change water quality of various water bodies, such as Rock Lake, and unidentified springs and seeps. Assuming these water bodies receive water from both shallow and deep ground water sources, reducing the source of deeper ground water could reduce the introduction of certain minerals considered to be necessary for potential populations of organisms. If this water quality change were to occur, it may be difficult to detect or measure. The likelihood for this to occur would be minimized because MMC has committed to advanced

drilling and grouting fracture zones encountered in the mine that would reduce or eliminate the hydrologic impacts to any one area.

If ground water flowed from the filled mine void to the East Fork Bull River, attenuation and dilution of the dissolved metals as it moved about 3,000 feet vertically through fractures would likely reduce concentrations. The actual flow path may be longer than 3,000 feet. The fate and transport of dissolved metals within the flooded mine void cannot be predicted without significant uncertainty, particularly considering the relatively low surface water standards. MMC intends to construct a three dimensional ground water model during the mine development period when additional hydraulic data would be collected. A calibrated model could be used to evaluate the potential for the migration of dissolved metals from the mine void to surface water drainages such as the East Fork Bull River. If modeling were to indicate potential exceedances of surface water standards in nearby streams, various mitigation measures would have to be adopted prior to active mining. The agencies' numerical model indicates that during the post-mining period, there would be the potential for ground water to flow toward the mine void from the East Fork Rock Creek drainage (including Rock Lake). If this were to occur, there may be subtle changes in the water quality of Rock Lake, as described in the previous paragraph.

Ground Water Levels-Tailings Impoundment and LAD Areas. The Little Cherry Creek Tailings Impoundment in Alternatives 2 and 4 is designed with an underdrain system to collect seepage from the tailings impoundment and divert intercepted water to a Seepage Collection Pond below the impoundment. A pumpback well system also would be necessary to collect tailings seepage that reached underlying ground water. Similar underdrain and pumpback well systems would be used at the Poorman Impoundment in Alternative 3. The tailings are expected to be placed in the impoundment with a high water content and as they consolidate, water would pool in low areas at the surface and would percolate downward. Most of the percolating water would be captured by the underdrain system, but some would seep into the underlying fractured bedrock aquifer. Tailings seepage not collected is expected to flow to ground water at a maximum rate of 25 gpm, slowly decreasing to 5 gpm after operations cease. The saturated zone beneath the impoundment would be able to accommodate the addition of 25 gpm from seepage and would respond with a rising water table (increasing the hydraulic gradient or slope of the water table) to convey the additional water from beneath the impoundment. Seepage from the tailings impoundment would enter the ground water system beneath the impoundment and be intercepted by a pumpback well system.

Four known springs and seeps along Little Cherry Creek would be covered by impoundment facilities. Flow from the springs above and below the tailings impoundment would remain relatively stable through the life of the mine.

In Alternatives 2, 3, and 4, mine and adit inflows greater than that needed in the mill or that could be stored in the tailings impoundment would be discharged at two LAD Areas between Ramsey and Poorman Creek. Ground water levels in the LAD Areas would rise, and increase the hydraulic gradient. The flow rate from springs between the two LAD Areas may increase. The increase in ground water levels would be a function of the application rate used at the LAD Areas. The agencies' analysis indicates the rates proposed by MMC in Alternative 2 would likely result in surface water runoff or increased spring and seep flow on the downhill flanks of the LAD Areas. In Alternatives 2, 3, and 4, the maximum application rate would be determined on a performance basis by monitoring both water quality and quantity changes to ground water. It is possible that monitoring would determine that the maximum application rate is higher or lower

than estimated by the agencies' analysis. The LAD application rates would be selected to ensure that ground water did not discharge to the surface as springs between the LAD Areas and downgradient streams.

Ground Water Quality-Tailings Impoundment and LAD Areas. No ground water users have been identified in the analysis area. Private land immediately downgradient of the Little Cherry Creek Tailings Impoundment Site in Alternatives 2 and 4 is owned by MMC. Private land immediately downgradient of LAD Area 2 in all alternatives and downgradient of the Poorman Impoundment Site in Alternative 3 is not owned by MMC.

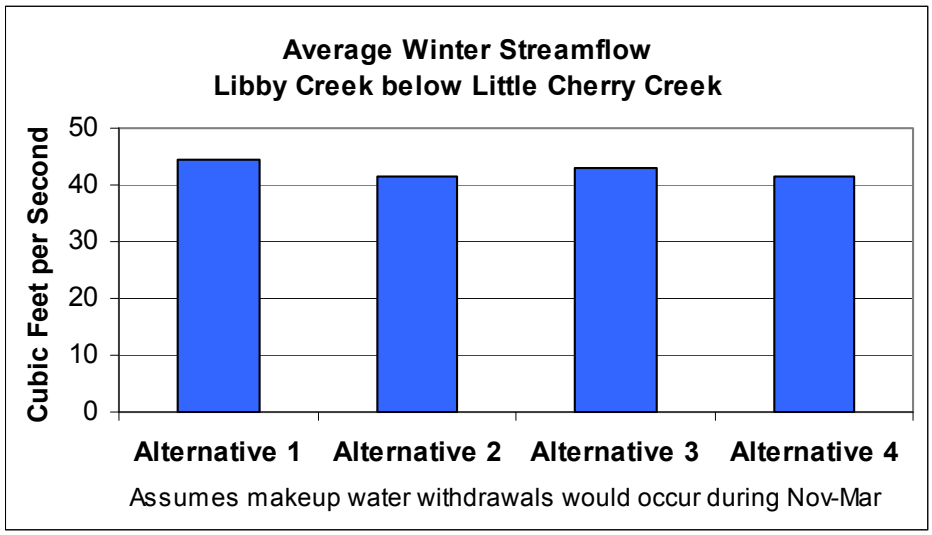
The BHES Order established numeric nondegradation limits for total dissolved solids, chromium, copper, iron, manganese, and zinc (both surface and ground water), as well as nitrate (ground water only), and total inorganic nitrogen (surface water only). These nondegradation limits apply to all surface water and ground water affected by the Montanore Project and remain in effect during the operational life of the mine and for as long thereafter as necessary.

In all alternatives, seepage not captured by the seepage collection system would mix with the underlying ground water. The existing ground water quality would be altered because the seepage water quality would have higher concentrations of nutrients, several metals, and total dissolved solids than existing water quality. Manganese concentrations are expected to be higher than the nondegradation limit set in a BHES Order in the mixing zone beneath the impoundment. Concentrations of all other parameters are predicted to be below ground water standards or BHES Order nondegradation limits. Concentrations of total dissolved solids, antimony, and manganese in all alternatives, nitrate in Alternative 2, and zinc in Alternatives 3 and 4 beneath the LAD Areas are predicted to exceed ground water standards or BHES Order nondegradation limits in one or more phases of mining. During the MPDES permitting process, the DEQ would determine if a mixing zone downgradient of the tailings impoundment or LAD Areas would be allowed and, if so, would determine the mixing zone's size, configuration, and location. MMC requested a source-specific mixing zone for the tailings impoundment. The DEQ would determine if a source-specific mixing zone should be granted in accordance with ARM 17.30.518. If DEQ granted a mixing zone, water quality changes may occur and certain water quality standards may be exceeded within the mixing zone. The DEQ also would determine where compliance with applicable standards would be measured.

Ground water beneath the LAD Areas would have higher concentrations of total dissolved solids, nutrients, and metals as long as the seepage collection facilities at the tailings impoundment operates and tailings water is discharged at the LAD Areas. The length of time these closure activities would occur is not known, but may be decades or more.

Surface Water Flows-During Mining. The analysis area is drained on the east by Libby Creek and its tributaries: Ramsey Creek, Poorman Creek, and Little Cherry Creek. Libby Creek flows north from the analysis area to its confluence with the Kootenai River near Libby. The analysis area is drained on the west by the East Fork Rock Creek and East Fork Bull River. The East Fork Rock Creek flows southwest into the Clark Fork River downstream of Noxon Reservoir. The East Fork Bull River flows northwest into the Bull River. The transmission line corridor area is drained by the Fisher River and its tributaries: Hunter Creek, Sedlak Creek, Miller and North Fork Miller creeks, Standard Creek, and West Fisher Creek; and by Libby Creek and its tributaries: Howard Creek, Midas Creek, and Ramsey Creek, all perennial streams. Numerous unnamed ephemeral streams also drain the analysis area. Snowmelt, rainfall, and ground water

discharge are the main sources of supply to streams, lakes, and ponds in the analysis area. High surface water flows typically occur during spring snowmelt, between April and July. Low flows typically occur during August and September.

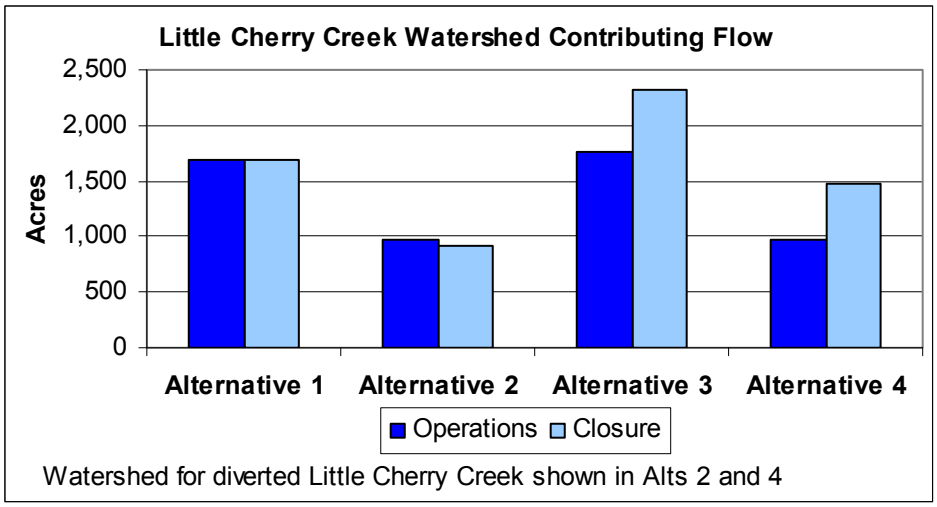


Alternative 1 would not affect surface water flow. All mine alternatives would reduce the flow in area streams during mining. The anticipated changes to base flow have been discussed in the preceding ground water section. Mine facilities would alter flow in Libby Creek and its tributaries through diversions, discharges, and make-up water wells. Changes in flow would not be measurable if withdrawals occur during high flow periods between April and July. In Alternatives 2 and 4, if withdrawals occur during November through March, average flow in Libby Creek below Little Cherry Creek during November through March would be reduced by 6 percent. Average flow in Alternative 3 would be reduced by 4 percent. Percent change in flow would be greater during lower flow periods and less in higher flow periods.

During operations in Alternatives 2 and 4, 13 percent of the Little Cherry Creek watershed would continue to contribute flow to the former Little Cherry Creek channel downstream of the Seepage Collection Dam; the estimated $7Q_{10}$ flow would be 0.01 cubic feet per second (cfs) and the estimated average annual flow would be 0.77 cfs. By intercepting ground water, the pumpback well system below the impoundment may further reduce base flow. The flow in Channel A would be about 60 percent of the flow of the original Little Cherry Creek.

In Alternative 3, any flow within the watershed above the impoundment would be routed to Poorman or Little Cherry creeks. Water from a 146-acre watershed above the Poorman Tailings Impoundment would be diverted to Poorman Creek, increasing the watershed of Poorman Creek by 4 percent. Water from an 80-acre watershed above the Poorman Tailings Impoundment would be diverted to Little Cherry Creek, an increase of 8 percent in the Little Cherry Creek watershed. The larger watershed would increase runoff during stormwater runoff and would not affect base flows.

Surface Water Flows-Post Mining. In Alternative 2, post-mining flows in Libby Creek above Bear Creek would be slightly reduced because surface water runoff from the impoundment would be routed to Bear Creek. The Bear Creek watershed area where runoff would meet the creek would increase by 560 acres, potentially increasing the flow in Bear Creek by 5 percent or less. The larger watershed would increase runoff during stormwater runoff and would not affect base flows.



The Little Cherry Creek Diversion Channel would remain in place, routing surface water runoff in the upper Little Cherry Creek watershed in the Diversion Channel to Libby Creek. After removal of the Seepage Collection Dam, runoff from the South Saddle Dam and the south Main Dam abutment would flow to the Diversion Channel. Runoff from the Main Dam face would flow to the former Little Cherry Creek drainage. Post-mining, 26 percent of the Little Cherry Creek watershed area would continue to contribute flow to former Little Cherry Creek downstream of the Seepage Collection Dam; the estimated $7Q_{10}$ flow of the creek would be about 0.02 cfs and the estimated average annual flow of the creek would be about 1.5 cfs. Average flows in the diverted Little Cherry Creek (Channel A) would be about 55 percent of the flow in the original Little Cherry Creek. For a short segment of Libby Creek between Channel A and Bear Creek, the change in the watershed areas that would contribute water to Libby Creek would be 3 percent or less. Below Bear Creek, flows in Libby Creek would return to pre-mine conditions, less any reduced base flows (predicted by the agencies to be immeasurable).

In Alternative 3, runoff from the reclaimed Poorman Tailings Impoundment surface would be routed toward Little Cherry Creek. The watershed area of Little Cherry Creek would increase by 644 acres, an increase of 38 percent. Average annual flows in Little Cherry Creek would increase by similar percentages. The larger watershed would increase runoff during stormwater runoff and would not affect base flows. Post-mining, changes in the watershed areas contributing water to Poorman and Libby Creek would be 3 percent or less. Below Little Cherry Creek, flows in Libby Creek would return to pre-mine conditions, less any reduced base flows (predicted by the agencies to be immeasurable).

After mining in Alternative 4, runoff from the reclaimed tailings impoundment surface would be routed via the permanent Diversion Channel and Channel A to Libby Creek. After the Seepage Collection Dam was removed, runoff from the South Saddle Dam and the south Main Dam abutment also would flow to the Diversion Channel. Consequently, the watershed of Channel A would increase by about 500 acres post-mining, compared to operational conditions. Average annual flow in the diverted Little Cherry Creek would be about five times the existing flow in Channel A, but about 10 percent less than the current flow of Little Cherry Creek. The larger watershed would increase runoff during stormwater runoff and would not affect base flows.

Runoff from the Main Dam would flow to the former Little Cherry Creek channel. Post-mining, the watershed area contributing water to the former Little Cherry Creek channel would decrease by 85 percent directly below the tailings impoundment and by 74 percent at the confluence of Little Cherry and Libby creeks. Changes in the watershed areas contributing flow to Bear and

Libby creeks would be 5 percent or less. Below Bear Creek, flows in Libby Creek would return to pre-mine conditions, less any reduced base flows (predicted by the agencies to be immeasurable). Bear Creek streamflow would not be affected.

Surface Water Quality. Water quality in analysis area streams is generally good. Total suspended solids, TDS, major ions, and nutrient concentrations are all low, frequently at or below analytical detection limits. Generally, TDS, major ion, and some minor ion concentrations (such as iron) increase downstream in Libby Creek and its tributaries. Some elevated metal concentrations can be attributed to local geology (mineralization).

In the analysis area, three stream segments are listed on Montana's 303(d) list of impaired streams. Libby Creek from 1 mile above Howard Creek to the U.S. 2 Bridge is listed. Use as a drinking water supply is not supported as a beneficial use, and aquatic life support and cold-water fishery uses are only partially supported for this reach. The Fisher River from the confluence of the Silver Butte Fisher River and the Pleasant Valley Fisher River to the confluence with the Kootenai River is also listed, with aquatic life support and cold-water fishery uses only partially supported. Rock Creek from the headwaters to the mouth below Noxon Dam is also listed, with aquatic life support and cold-water fishery uses only partially supported. Total Maximum Daily Loads (TMDLs) for the impairments have not been prepared by the DEQ.

Alternative 1 would not affect surface water quality. Alternatives 2, 3, and 4 would affect stream quality by changing dissolved solids, nutrients, and metals concentrations. Changes would occur in part due to reductions in streamflow contributions from deeper ground water, which contributes more total dissolved solids to streams than shallower sources of water. Water quality changes also would occur due to wastewater discharges at the LAD Areas. The agencies' analysis indicated that concentrations of total inorganic nitrogen and manganese in Ramsey and Poorman creeks may exceed BHES Order limits in all alternatives during one or more phases of mining. Antimony and zinc concentrations may also exceed surface water standards or BHES Order limits. With proposed treatment, instream concentrations following discharges would be at or below concentrations set in the BHES Order, surface water quality standards, or ambient concentrations. If land application of excess water would result in water quality exceedances, MMC would treat the water at the Libby Adit Water Treatment Plant prior to land application. If needed, an additional water treatment facility may be required. Water discharged from the treatment facilities to a nearby stream could not cause an exceedance in a BHES Order nondegradation limit or water quality standard for all parameters. Concentrations of total inorganic nitrogen in streams affected by the Montanore Project may increase to 1 mg/L, copper to 0.003 mg/L, and manganese to 0.05 mg/L, the limits set in the BHES Order.

Surface Water Quality-Sediment. In Alternatives B, C, and D, areas cleared of vegetation would be susceptible to erosive forces and soil loss. Loss of soil also would occur from the removal and storage of soils during mine operations and from erosion of exposed soils during reclamation and stabilization. Soil erosion caused by wind or water likely would occur during all phases of the project. Initial erosion rates would be moderate to high due to soil exposure, slope steepness, and precipitation patterns.

In Alternative 2, MMC proposed a 10,800-foot Little Cherry Creek Diversion Channel around the tailings impoundment that would flow into Libby Creek. The Diversion Channel would consist of two main sections: an upper engineered channel and two existing natural drainage channels tributary to Libby Creek. The lower channels are not large enough to handle the expected flow

volumes; these tributaries would undergo channel adjustments until they stabilized. These adjustments would include bank erosion, channel scouring, and sloughing of bank material, which would contribute sediment to Libby Creek. MMC would construct some bioengineering and structural features in the two unnamed tributary channels to reduce flow velocities, minimize erosion in the unnamed tributaries, minimize sedimentation to Libby Creek, and create fish habitat. In addition, MMC would evaluate potential locations for creating wetlands and ponds in low gradient areas to capture and retain most of the sediment generated from the unnamed tributaries and minimize sedimentation to Libby Creek. Bank erosion in the unnamed tributaries and possibly sedimentation to Libby Creek would continue until the tributaries adjusted to the increased flow volumes. If substantial erosion occurs once the diversion channel was operational, additional erosion control structures would be constructed as needed.

One of the possible fisheries mitigation projects proposed by MMC would be to conduct a sediment-source inventory in the watershed, and stabilize, recontour, and revegetate priority source areas, which are typically roadcuts in Libby, Hoodoo, Poorman, Midas, and Crazyman creeks. If implemented, this project would minimize the contribution of additional sediment to the Libby Creek watershed.

Alternative 4 would have similar effects as Alternative 2. The Diversion Channel in Alternative 4 would flow into a constructed channel that would be designed to be geomorphologically stable and to handle the 2-year flow event. A floodplain would be constructed along the channel to allow passage of the 100-year flow. Natural and biodegradable materials and vegetation would be used along stream banks and on the floodplain to minimize erosion, stabilize the stream channel and floodplain, and minimize sedimentation to the lower channel and Libby Creek. Following reclamation of the impoundment, the constructed channel would undergo an additional period of channel adjustment when runoff from the impoundment surface was directed to the Diversion Channel. The increase in flow would be about 50 percent higher than during operations, and would lead to new channel adjustments. This would likely cause short-term increases in sedimentation in the lower channel and Libby Creek.

Alternative 3 would result in less sedimentation of analysis area streams than Alternatives 2 or 4 because diversion of a perennial stream would not be needed. Effects of vegetation clearing for mine facilities and access roads would be similar to Alternatives 2 and 4.

In Alternatives 3 and 4, MMC would initially identify existing sediment sources in Libby Creek particularly near the plant site and then off-site in Ramsey, Poorman, or upper Libby creeks. After existing sediment sources were identified, MMC would develop sediment abatement and instream stabilization measures designed to reduce sediment contribution from the identified sources. This mitigation would minimize the contribution of additional sediment to the Libby Creek watershed.

Issue 3: Fish and Other Aquatic Life and Their Habitats

Aquatic habitat in most analysis area streams is good to excellent. The riparian habitat condition in Libby Creek between Poorman Creek and Little Cherry Creek is fair, reflecting the physical effects of abandoned placer mining operations. Overall, the analysis area streams score high on measures such as bank cover and stability, while measures of pool quality and quantity are typically lower, resulting in an overall reduction in stream reach scores for habitat condition. Most streams have a moderate susceptibility to habitat degradation.

Analysis area streams provide habitat for the federally listed bull trout, and Forest sensitive species westslope cutthroat trout and interior redband trout. Mixed redband rainbow, coastal rainbow, and westslope cutthroat/rainbow hybrids, Yellowstone cutthroat, brook trout, torrent and slimy sculpin, mountain whitefish, longnose dace, and largescale suckers are also in the drainages. In the mine analysis area, designated critical bull trout habitat is found in four segments of Rock Creek and three segments of Libby Creek. Bull trout are found in most streams, except where barriers have prevented their passage, such as Little Cherry Creek and Miller Creek. No pure westslope cutthroat trout populations have been found to inhabit stream reaches within the Libby Creek watershed. The hybrid trout populations in Ramsey Creek, Bear Creek, Little Cherry Creek, and segments of Libby Creek downstream of the mine area include coastal rainbow/westslope cutthroat and redband/westslope cutthroat trout hybrids. The East Fork Bull River has a pure westslope cutthroat trout population, and both pure and hybrid populations are found in East Fork Rock Creek. Miller Creek has a pure westslope cutthroat trout population. Pure populations of interior redband trout are found in Libby, Bear, Little Cherry Creek, Poorman, and Ramsey creeks and in the Fisher River.

In Alternative 1, No Mine, the Montanore Project would not be developed and existing disturbances would continue to affect aquatic habitats. Past activities, particularly timber harvest and road construction, and ongoing current activities have occurred in RHCAs, and would continue to decrease the quality of aquatic habitats. Productivity of fish and other aquatic life in analysis area streams would continue to be limited by past natural and human-caused adverse habitat changes, by naturally low nutrient concentrations, and by natural habitat limitations from periodic floods and other climate and geology influences.

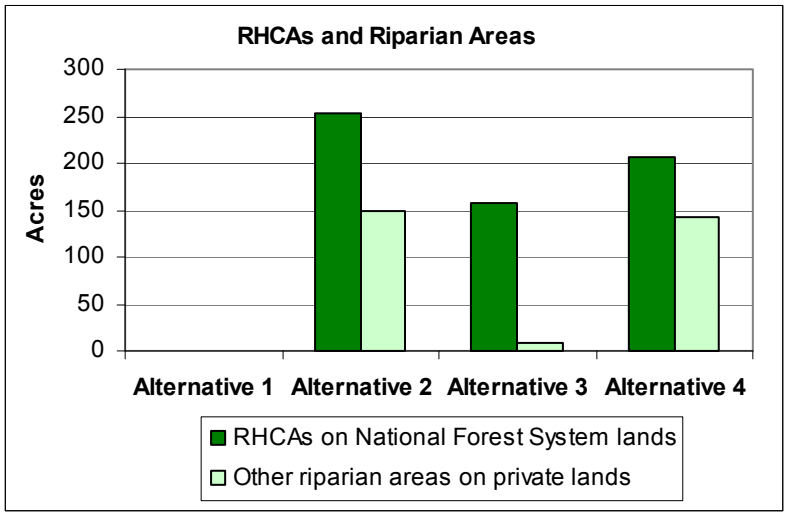
Bull trout populations would continue to be marginal and their habitat would continue to be in need of restoration work. Bull trout populations would be susceptible to decline or disappearance due to hybridization with the introduced brook trout, competition with brook trout and other trout present in the analysis area, or from other land use disturbances. Redband trout and westslope cutthroat trout also would continue to be subject to population declines, mainly due to the threat of hybridization from past introductions of non-native salmonids.

Sediment. Periodic short-term increases in the amount of sediment would occur in streams in the Libby Creek watershed in Alternatives 2, 3, and 4. An increase in the amount of sediment in streams can alter stream habitat by decreasing pool depth, affecting substrate composition, filling in interstitial spaces used by juvenile fish and invertebrates, and increasing substrate embeddedness. These habitat alterations in turn can adversely affect the invertebrate and fish populations within the streams. The abundance of fine sediment does not currently appear to be a limiting factor to trout populations within most stream reaches within the Libby Creek watershed. Competition with brook trout and other trout species is one of the larger threats to bull trout in the Libby Creek drainage, and there are indications that brook trout are more successful than native trout in degraded areas, including areas where fine sediment levels are increased. Slight increases in sediment in Libby Creek may give the brook trout present in this stream a competitive advantage over bull trout. The introduction of small amounts of additional small gravels and fine sediment from construction or operation of the mine would likely have few effects on macroinvertebrate and fish populations, and these effects would be short-term, as annual snowmelt runoff would flush most accumulated fine sediments downstream. The optional mitigation in Alternative 2 and the required mitigation in Alternatives 3 and 4 includes an inventory of existing sediment sources in the Libby Creek watershed and the implementation of sediment abatement and instream stabilization measures designed to reduce sediment contribution

from the identified sources. Alternatives 3 and 4 also would include the installation of grade control structures in a reach of Libby Creek between Little Cherry Creek and Bear Creek to decrease the width to depth ratio and increase the frequency of deep pool habitat. Grade control structures would improve bedload transport, decrease width to depth ratios, and reduce fine sediment accumulation.

Riparian Habitat Conservation Areas. RHCAs are protection zones adjacent to streams, wetlands, and landslide-prone areas. The KFP has standards and guidelines for managing activities that potentially affect conditions within the RHCAs, and for activities in areas outside RHCAs that potentially degrade RHCAs. These standards apply only to riparian areas on National Forest System lands. Similar riparian areas are found on private land. All riparian areas are covered by Montana's Streamside Management Zone law.

Alternatives 2, 3, and 4 would require construction of roads, waste disposal facilities, and other facilities in RHCAs. Protection of RHCAs was a key criterion in the alternatives analysis and development of alternatives. The lead agencies did not identify a practicable alternative that would avoid locating mine facilities in RHCAs. Alternative 2 would affect 253 acres of RHCAs and 148 acres of other riparian areas on private lands, primarily in the Little Cherry Creek Impoundment Site and the Ramsey Plant Site. Little Cherry Creek and Ramsey Creek are both fish-bearing streams. Effects of Alternatives 3 and 4 would be less than Alternative 2. Alternative 3 would affect 158 acres of RHCAs and 9 acres of other riparian areas on private lands. The RHCAs in the Poorman Tailings Impoundment Site in Alternative 3 are not adjacent to fish-bearing streams. The Libby Plant Site in Alternatives 3 and 4 would not affect RHCAs. The disturbance area at the Little Cherry Creek Impoundment Site would be changed in Alternative 4 to avoid RHCAs. Alternative 4 would affect 206 acres of RHCAs and 143 acres of other riparian areas on private lands, primarily in the Little Cherry Creek Impoundment Site. In Alternatives 3 and 4, MMC would develop and implement a final Road Management Plan to reduce effects on RHCAs. The plan would describe for all new and reconstructed roads criteria that govern road operation, maintenance, and management; requirements of pre-, during-, and post-storm inspection and maintenance; regulation of traffic during wet periods to minimize erosion and sediment delivery and accomplish other objectives; implementation and effectiveness monitoring plans for road stability, drainage, and erosion control; and mitigation plans for road failures.



Water Quantity. During operations, Alternatives 2, 3, and 4 would alter flow in Libby Creek and its tributaries through diversions, discharges and make-up water wells. Changes in flow would not be measurable if withdrawals occur during high flow periods between April and July. If withdrawals occur during November through March, average flow in Libby Creek below Little Cherry Creek would be reduced by 4 to 6 percent, depending on the amount of mine inflows and

the alternative. Percent change in flow would be greater during lower flow periods and less in higher flow periods. The inherent difficulties in accurately measuring low flows and the natural variability in low winter flow make the determination of impacts to fish habitat very difficult, but the decrease in flow would decrease available habitat. Except for Little Cherry Creek, changes in flow in Libby Creek tributaries would not affect aquatic life. Post-closure, a slight decrease in Libby Creek streamflow may decrease available habitat slightly during low flow periods, adversely affecting salmonids in the stream. During the post-mining period, water would continue to be released from tailings consolidation and discharged at the LAD Areas. Discharges at the LAD Areas would continue to increase Libby Creek streamflows. This additional flow in Libby Creek below the LAD Areas would partially offset the reduction in base flow when discharges occurred. Aquatic habitat would not be affected as long as discharges continue. The installation of 25 structures in Libby Creek in Alternatives 3 and 4 would offset the reduction of fish habitat in the creek.

In Alternatives 2 and 4, Little Cherry Creek would be diverted permanently around the tailings impoundment, resulting in a loss of 13,000 feet of aquatic habitat in the existing Little Cherry Creek. The diverted Little Cherry Creek would be shorter (9,500 feet) and consequently steeper. In Alternative 2, average flow in the diverted Little Cherry Creek during operations would be about 60 percent of the average flow in the existing Little Cherry Creek, and about 55 percent after closure. Alternative 4 would have similar effects on flow during operations. After closure, flow in the diverted Little Cherry Creek in Alternative 4 would be about 90 percent of the average flow in the existing Little Cherry Creek because flow from the impoundment surface would flow to the diverted creek and not to Bear Creek. The agencies' analysis assumed the engineered diversion channel would not provide any fish habitat, while the two channels would eventually provide marginal fish habitat for either redband trout or bull trout. Effects on the redband trout population in Little Cherry Creek would be minimal but would persist long-term.

In both alternatives, MMC would collect all fish in the existing stream section and move the fish to the newly constructed diversion channel. While MMC would remove redband trout safely from the section of Little Cherry Creek to be diverted and then place them in the new diversion drainage, some fish mortality due to handling stress may occur from removal, storage, or replacement methods. MMC would design the Little Cherry Creek Diversion Channel, to the extent practicable, for fish habitat and passage. MMC's survey of the unnamed tributary to Libby Creek that would receive diverted water (Channel A) shows that most of the drainage would develop habitat comparable to Little Cherry Creek.

During operations, Alternatives 2, 3, and 4 would reduce flow in East Fork Rock Creek and East Fork Bull River. These flow changes would affect aquatic habitat in the East Fork Rock Creek between Rock Lake and Rock Creek Meadows, a distance of about 0.75 mile. Trout habitat may be reduced during low flows from August to April. This habitat loss would be detrimental to the resident westslope cutthroat trout populations in the higher elevations of East Fork Rock Creek. Changes in flow from Rock Creek Meadows downstream would not likely be measurable, but would contribute to the dewatered sections and lower habitat in lower Rock Creek. Changes in flow in the East Fork Bull River below St. Paul Lake during mine operations may be difficult to separate from the natural variability of low flows. Flow reductions in the upper river may result in habitat loss and adversely affect the bull trout population that spawns in East Fork Bull River.

For fisheries mitigation in Alternatives 3 and 4. MMC would complete a comprehensive aquatic habitat assessment from the confluence of the East Fork Bull River and Snake Creek up to the

extent of fish habitat in the East Fork Bull River (~1.3 miles past the CMW boundary). Following completion of the habitat inventory, MMC would construct instream structures forming pools and deep water habitat (>1.5 feet depth) from Snake Creek to a location 0.5 mile into the CMW. Trail #935 leading to Rock Lake would be converted from a motorized trail to a non-motorized trail, reducing its sediment contribution and increasing riparian habitat along the trail. These measures would improve aquatic habitat in Rock Creek and the East Fork Bull River.

Water Quality. Alternatives 2, 3, and 4 would increase concentrations of nutrients, such as nitrates, and some metals in Ramsey, Poorman, and Libby creeks. Presently, low nutrient concentrations contribute to the naturally limited aquatic productivity. If the total organic nitrogen concentration in Libby Creek surface water increases to the allowable concentration of 1 mg/L set in the BHES Order, this would be an increase over existing concentrations in Libby Creek by a factor of 2 to 5. Increases in total organic nitrogen concentrations to 1 mg/L would be more likely near the discharge areas (LAD Areas and the Libby Adit), as total organic nitrogen concentrations would decrease downstream due to dilution with higher streamflows. The total organic nitrogen concentration increase may cause an increase in algal growth in Libby Creek, but algal growth would more likely be limited by factors other than nitrogen, such as phosphorus, temperature, flow, and light. Although the projected total organic nitrogen concentration would be greater than existing conditions, the ammonia component of total organic nitrogen would remain well below the applicable standard.

The BHES Order would allow an increase of copper up to 0.003 mg/L in all project waters. About half the surface water samples from Libby Creek had copper concentrations below the detection limit, 15 percent were greater than 0.003 mg/L, and the remaining samples were 0.003 mg/L or less. The enrichment for copper may increase up to a factor of 3 or more, depending on the actual copper concentration of samples with below detection limit values, and the actual instream copper concentration after discharge of wastewater. Potential effects to aquatic life from an increase in copper concentrations are difficult to determine given the uncertainty with the protectiveness of the hardness-modified copper standard and existing copper concentrations. Measured copper concentrations are either at or near minimum laboratory detection limits, creating some uncertainty with the projected change in concentrations from existing conditions.

Issue 4: Scenic Quality

The existing scenery from Key Observation Points (KOPs) would not change in the No Mine Alternative. The existing Libby Adit Site would remain, and would be visible only from one KOP in a montane forest at a National Forest System road #231 pullout. Disturbances on private land at the Libby Adit Site would remain until reclaimed in accordance with existing permits and approvals.

Construction of all proposed mine facilities would alter the scenic integrity from KOPs. The relatively large size of the tailings impoundment in Alternatives 2, 3, and 4 in all views would create noticeable contrasts in landscape character and significant alterations in scenic integrity. The tailings impoundment in Alternatives 2 and 4 would cover Little Cherry Creek, altering the area's scenic integrity. In addition, there would be the short-term effects from the presence of fugitive dust from construction activities, night lighting for construction operations, and vehicle traffic. The agencies' mitigations in Alternatives 3 and 4 would reduce the visual contrasts at most facility locations. Long-term effects on scenery would be loss of vegetation and landform changes at all mine facilities. Following mine closure, landscape reclamation at all mine facilities, except

the tailings impoundment, would create areas similar in appearance to abandoned roads and timber harvest areas. The tailings impoundment would have physical characteristics significantly contrasting with the surrounding landscape. The scenic integrity and landscape character changes at the impoundment site would be noticeable indefinitely.

In Alternatives 2, 3, and 4, the KNF would amend the KFP by reallocating to MA 31 all areas within the operating permit areas of LAD Areas 1 and 2, and portions of the plant site and tailings impoundment currently not in MA 31. In addition, a proposed road and facility corridor that would cross MA 13 would be reallocated to MA 31. MA 31 has a Visual Quality Objective (VQO) of Maximum Modification. All mine facilities would be in compliance with a VQO of Maximum Modification.

Issue 5: Threatened and Endangered Wildlife Species

The mine area provides habitat for three threatened and endangered wildlife species: the grizzly bear, the gray wolf, and the Canada lynx. This summary provides a brief discussion of effects on threatened and endangered wildlife species; the reader is referred to section 3.24.5, *Threatened, Endangered, and Proposed Species* in the *Wildlife Resources* of Chapter 3 for a complete analysis of effects on threatened and endangered wildlife species. Bull trout, which is also a threatened and endangered species, was discussed previously under Issue 3, Effects on Fish and Other Aquatic Life and Their Habitats.

Grizzly Bear. The agencies used five criteria to assess effects on the grizzly bear: percent core habitat, percent open motorized route density (OMRD), percent total motorized route density, linear open road density, and percent habitat effectiveness (HE). Because percent OMRD, percent total motorized route density, and linear open road density are all a function of open roads, only percent OMRD is discussed in this Summary.

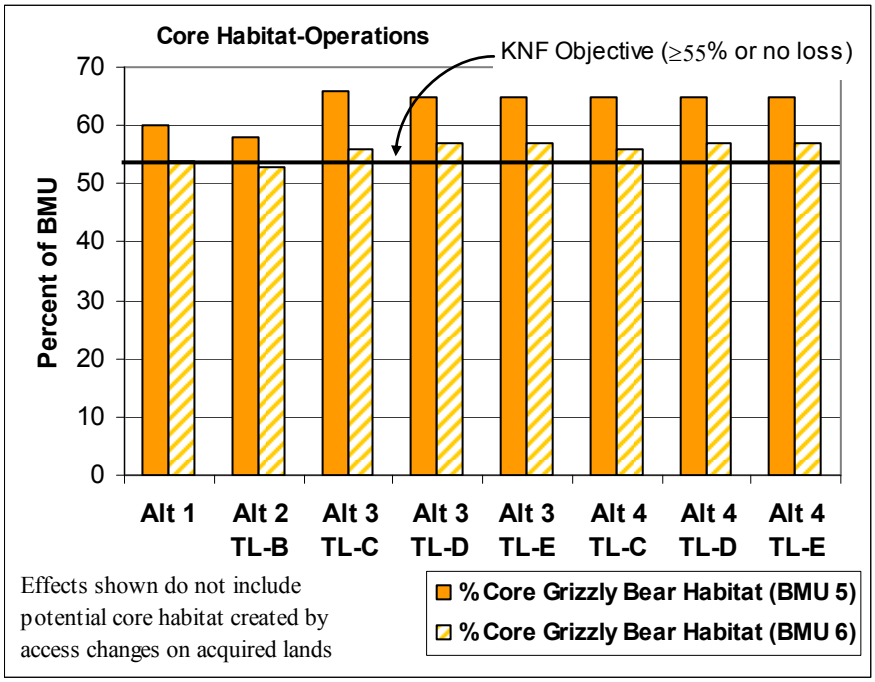
These criteria are evaluated within a planning area called a Bear Management Unit, or BMU. A BMU is an area of land containing sufficient quantity and quality of all seasonal habitat components to support a female grizzly. The project would affect habitat in two BMUs: BMU 5, St. Paul, and BMU 6, Wanless.

Because of the complexity of the analysis, the agencies did not complete separate analyses for criteria dependent on open roads for the mine alternatives and transmission line alternatives. Instead, the agencies analyzed combinations of mine and transmission line alternatives, which would compose a complete project. Alternative 2-TL B is MMC's proposed mine (Alternative 2) and its proposed North Miller Creek transmission line alternative (Alternative B). Six other mine and transmission line alternative combinations were analyzed: mine Alternative 3 with the three agencies' transmission line alternatives (Alternatives C, D, and E); and mine Alternative 4 with the three agencies' transmission line alternatives (Alternatives C, D, and E). These combinations are discussed in the following sections on effects to grizzly bear.

Percent Core Habitat. A core area or core habitat is an area of high quality grizzly bear habitat within a BMU that is greater than or equal to 0.31 mile from any road (open or restricted), or motorized trail open during the active bear season. Core habitat may contain restricted roads, but such roads must be effectively closed with devices, including but not limited to, earthen berms, barriers, or vegetative growth. Federal agencies will work toward attaining a core area of at least 55 percent in the BMU and will allow no loss of core areas on federally-owned land within the BMU.

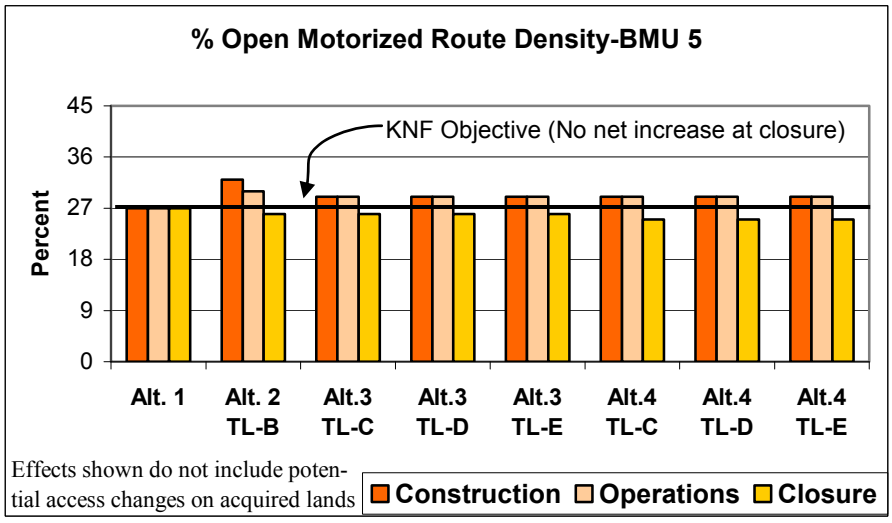
Alternative 2 TL-B would reduce core habitat from 60 percent in BMU 5 to 58 percent during construction and operations, and to 59 percent at closure. Access changes proposed by the KNF would create core habitat in the agencies' alternatives, and core habitat in the other six alternative combinations would increase to 65 or 66 percent during construction, operations, and closure.

Core habitat in BMU 6 (54 percent) currently is below the goal of 55 percent and would remain so in Alternative 1. During construction, operations, and closure, Alternative 2-TL B would reduce core habitat from 54 percent in BMU 6 to 53 percent. Core would increase through access changes to between 55 and 57 percent in all other alternative combinations during all three periods.

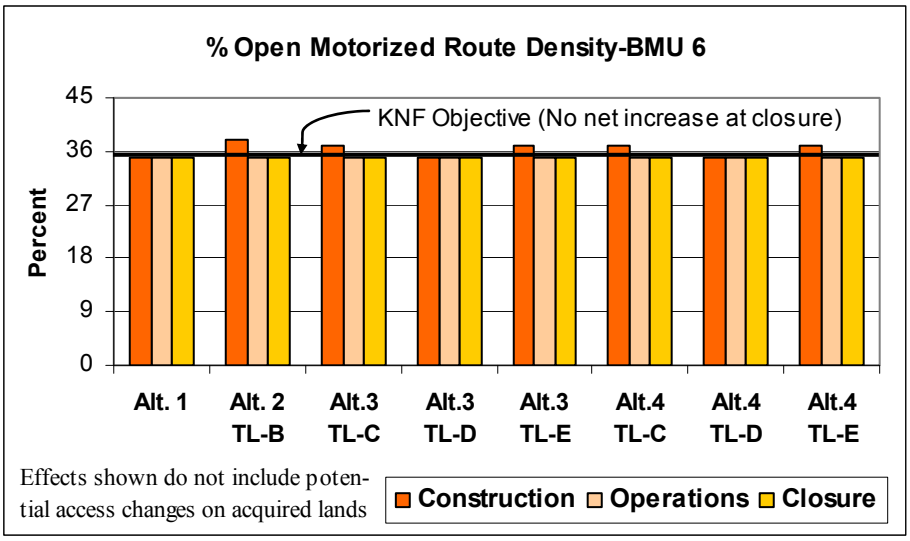


For all combined mine-transmission line alternatives, impacts to core habitat would be reduced through MMC's or the agencies' proposed land acquisition programs. Parcels that might otherwise be developed in a manner inconsistent with bear needs would be acquired by MMC, conveyed to the KNF, and managed for grizzly bear use in perpetuity. The agencies anticipate additional land acquisition beyond that proposed by MMC would be necessary to mitigate all effects. The agencies' proposed land acquisition program has the potential to increase core habitat through access changes on acquired land. The potential increase in core habitat from acquired lands is not shown in the above chart.

Open Motorized Route Density. OMRD is a measure of the density of roads or trails in a BMU that are open for motorized access. Best science indicates that OMRD greater than 1 mi/mi^2 should not exceed



33 percent of a BMU. Federal agencies will allow no net increase in OMRD on federally-owned land within the BMU.



All combined alternatives would increase OMRD in BMU 5 during construction and operations. OMRD in BMU 5 would be better than existing densities after closure for all Alternatives. Compliance with OMRD direction is based on densities at mine closure.

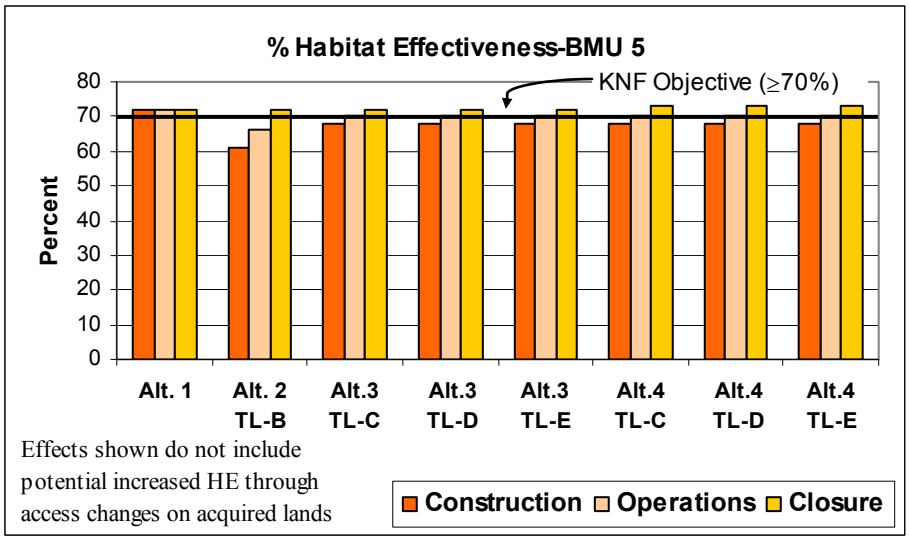
OMRD in BMU 6 during construction would be worse than existing densities in all combined alternatives, and would return to existing densities during operations and after closure for all combined alternatives. The agencies' proposed land acquisition program has the potential to improve OMRD in BMUs 5 and 6 through access changes on acquired land.

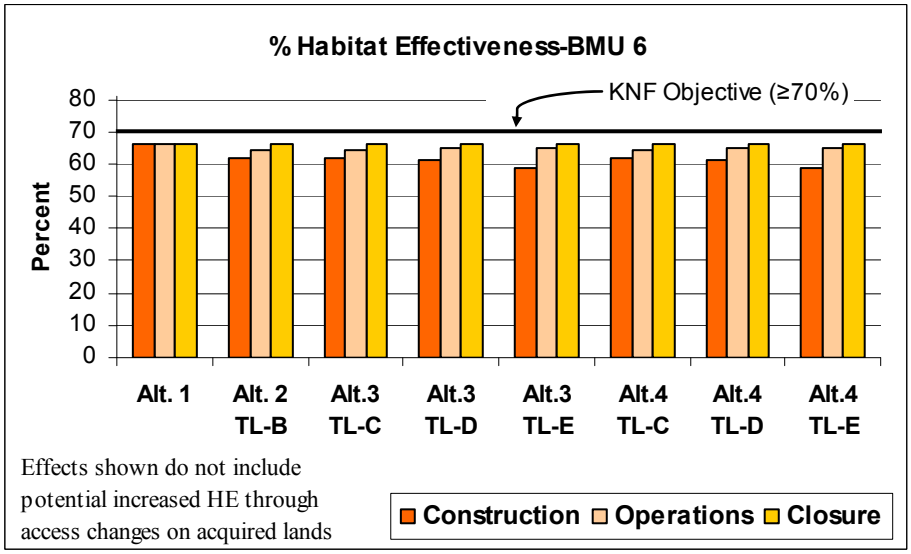
Habitat Effectiveness. HE is the amount of secure grizzly bear habitat (habitat at least 0.25 mile from open roads, developments, and high levels of human activity during the active bear year) remaining within a BMU after affected areas and Management Situation 3 lands (where grizzly bear presence is possible but infrequent) are subtracted from the total habitat in the BMU. Management Situation 3 lands are areas of high human use where grizzly bear presence is possible but infrequent and where conflict minimization is a high priority management consideration. Grizzly bear presence and factors contributing to their presence will be actively discouraged.

HE is calculated for all lands within an affected BMU, regardless of ownership. In calculating HE, the extent of a zone of influence depends on the type of activity. HE should be maintained equal to or greater than 70 percent of the BMU.

For all combined mine-transmission line alternatives, impacts to HE during all three phases would be reduced through MMC's (Alternatives 2 and B) and the agencies' proposed land acquisition programs (all other alternatives). Acquired parcels that might otherwise be developed in a manner inconsistent with bear needs would be managed for grizzly bear use in perpetuity. The agencies anticipate additional land acquisition beyond that proposed by MMC would be necessary to mitigate all effects. The agencies' proposed land acquisition program would likely result in a net gain in grizzly bear habitat effectiveness, through access changes and elimination of sources of grizzly bear disturbance, where possible. Potential increased HE through land acquisition is not shown in the charts or discussed in the following paragraphs.

Alternative 2 TL-B would have greater effect to HE in BMU 5 than the other alternatives, reducing HE to 61 percent during construction and 66 percent during operations, primarily because effects of the Ramsey Plant Site would occur in a separate drainage than other mine facilities. The combined agencies' alternatives would have the same effects on HE in BMU 5, reducing HE to 68 percent during construction and 70 percent during operations. At closure, HE would be 72 to 73 percent in all combined alternatives.





In BMU 6, Alternatives 3 TL-E and 4 TL-E would reduce HE to 59 percent during construction, due to a larger extent of helicopter activity. The other combined alternatives would reduce HE in BMU 6 to 61 or 62 percent during construction. During operations, all alternatives would be similar, reducing HE to 64 or 65 percent. At closure, HE would return to 66 percent in all combined alternatives.

Gray Wolf. The agencies evaluated impacts to the gray wolf based on three criteria: year-round prey base, suitable denning and rendezvous sites, and sufficient space with minimal exposure to humans. The condition of the prey base is evaluated based on KFP management standards for white-tailed deer and elk. Sufficient space with minimal exposure to humans is generally measured by maintaining ORD standards required by the KFP as well as maintaining any security habitat recommended in the big game habitat recommendations. The Fishtrap pack is the only known wolf pack potentially affected by the Montanore Project. At least two wolves use portions

of the analysis area on a regular basis. No wolf packs or den sites have been confirmed in this general area.

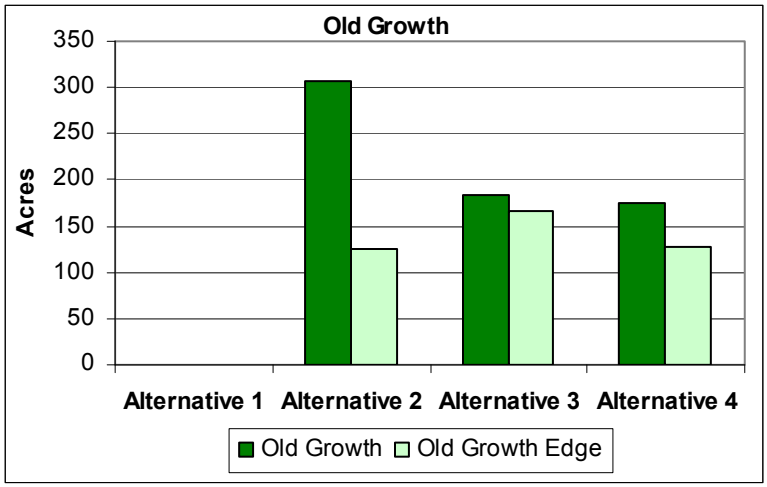
Alternative 1 would not affect the gray wolf and would not change existing conditions for prey base, denning and rendezvous sites, or space with minimal exposure to humans. For all mine alternatives, sufficient populations of elk, deer and other prey species would continue to be maintained, and would continue to provide a good year-round prey base for wolves, and no known den or rendezvous sites would be affected by any of the mine alternatives. All mine alternatives would increase road densities, resulting in increased potential for human disturbance and an increased risk of human-caused wolf mortality. Road densities would increase more for Alternative 2 in the Crazy Planning Subunit, and would remain worse than existing densities until after mine closure.

For all alternatives, impacts to the gray wolf would be reduced through MMC's or the agencies' proposed land acquisition programs. Acquired parcels would be managed for grizzly bear use in perpetuity, and could contribute additional wolf habitat where roads could be closed. For the agencies' alternatives, potential impacts to wolves also would be minimized through road access changes that would create security habitat for prey species and reduce motorized access of wolf habitat, prohibiting employees to carry firearms, removing road-killed big game animals, implementing a transportation plan to reduce mine traffic, and monitoring road-killed animals. Overall, all mine alternatives would have a minimal effect on the gray wolf.

Canada Lynx. The impacts analysis for the Canada lynx follows the objectives, standards, and guidelines established in the Northern Rockies Lynx Management Direction (Lynx Amendment). Standards are evaluated for Lynx Analysis Units (LAUs) that approximate a lynx home range size. Alternatives B, C, and D would comply with Lynx Amendment standards with the following exception. All mine alternatives would affect multi-story or late-successional forest snowshoe hare (lynx denning) habitat and would not meet this standard. Impacts to multi-story or late-successional forest snowshoe hare habitat from mine alternatives would occur only in LAU 14504, and would range from 167 acres for Alternative 3 to 391 acres for Alternative 2.

Issue 6: Other Wildlife and Key Habitats

Old Growth. Alternative 1 would have no direct effect on designated old growth or associated plant and wildlife. All old growth areas would maintain their existing conditions and continue to provide habitat for those species that use the area over a long term. Alternatives 2, 3, and 4 would reduce the amount of old growth in the Crazy Planning Subunit. Old growth removed for mine facilities would range from 175 acres in Alternative 4 to 307 acres in Alternative 2. Alternatives 2, 3, and 4 would reduce the quality of old growth by creating openings in old growth, or



creating an "edge effect." Edge effects would range from 125 acres in Alternatives 2 and 4, to 167 acres in Alternative 3.

Mine Alternatives 2, 3, and 4 would require a project-specific amendment to allow harvest within designated old growth stands (MA 13). The project-specific amendment would change the current MA 13 (Designated Old Growth) designation of all harvested stands to MA 31 (Mineral Development). In Alternatives 3 and 4, the KNF would designate 587 acres in Alternative 3 and 657 acres in Alternative 4 of additional old growth on National Forest System lands. Designation of additional areas of old growth would not create new old growth, but would ensure that these areas are managed to retain or develop old growth characteristics. Losses and degradation of old growth habitat may be offset by land acquisition associated with grizzly bear habitat mitigation if old growth habitat characteristics were present on the acquired parcels. Sufficient designated old growth would be present below 5,500 feet in all alternatives to be consistent with the KFP direction regarding old growth.

Pileated Woodpecker. In Alternative 1, natural successional processes would continue to occur throughout old growth stands and habitat would continue to be provided for pileated woodpecker nesting pairs where feeding and breeding conditions are suitable. There would be no direct or indirect impacts to pileated woodpecker (old growth habitat) from Alternative 1, and no change in potential population index. The effects on old growth in Alternatives 2, 3, and 4 would reduce nesting and foraging habitat and habitat quality for the pileated woodpecker. The potential population index in Alternatives 2, 3, and 4 would not be affected. Alternatives 2, 3, and 4 would result in the loss of snags and downed logs greater than 10 inches diameter at breast height that provide potential nesting and foraging habitat for pileated woodpeckers. Snag densities and quantities of down wood would remain above KNF-recommended levels and would continue to be sufficient to sustain viable populations of cavity-dependent species in the KNF.

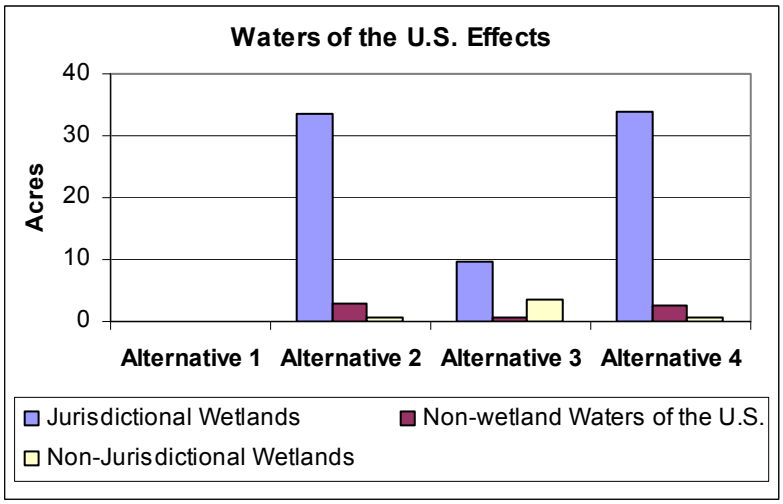
Issue 7: Wetlands and Non-Wetland Waters of the U.S.

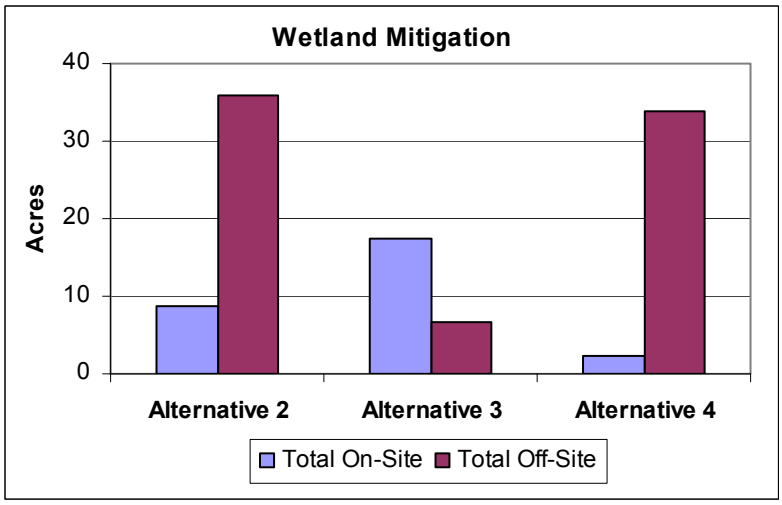
The No Mine Alternative would not disturb or affect any wetlands or waters of the U.S. Any existing wetland disturbances would be mitigated in accordance with existing permits and approvals.

Alternatives 2, 3, and 4 would require the unavoidable filling of jurisdictional wetlands, non-jurisdictional wetlands, and other waters of the U.S. The Corps determines a water to be subject to its jurisdiction if the water body is a traditionally navigable water, relatively permanent, or a wetland that directly abuts a traditionally navigable or relatively permanent water body, or, in combination with all wetlands adjacent to that water body, has a significant nexus with traditionally navigable waters. All waters of the U.S. as well as activities that require the discharge of fill material into wetlands or waters of the U.S. are regulated by the Corps. Based on a Supreme Court 2001 ruling, wetlands that are isolated from other waters of the U.S., and whose only connection to interstate commerce is use by migratory birds, do not fall under Corps' jurisdiction. The terms "isolated" and "non-jurisdictional" wetlands are used synonymously.

Effects of Alternatives 2 and 4 would be similar, affecting 34 acres of jurisdictional wetlands, about 1 acre of non-jurisdictional wetlands, and about 3 acres of other waters of the U.S. Alternative 3 would have less effect than Alternatives 2 and 4. Alternative 3 would affect 9.7 acres of jurisdictional wetlands, 3.4 acres of non-jurisdictional wetlands, and less than 1 acre of other waters of the U.S. In all alternatives, mitigation measures for wildlife and fisheries include

activities in waters of the U.S. Any wetlands and waters of the U.S. disturbed during the implementation of these measures are not accounted for in the acreage listed above. In the short term, these activities would increase sedimentation in area streams and adjacent wetlands and waters of the U.S. After the activities were completed, and the roads became stabilized, these mitigation measures would increase the function and values of any associated wetlands and would decrease sediment delivery to waters of the U.S.





MMC proposes to replace forested and herbaceous wetlands at a 2:1 ratio and herbaceous/shrub wetlands at a 1:1 ratio. On-site mitigation opportunities would involve wetland restoration and wetland creation. A total of 8.8 acres of on-site mitigation is proposed for Alternative 2. Off-site mitigation would occur outside the permit area boundary. A total of 35.8 acres of off-site mitigation would mitigate for effects associated with Alternative 2. Most mitigation sites would be located in the Poorman Creek area. The Corps would be responsible for developing final mitigation ratios, depending on the function and values of the affected wetlands. Replacing herbaceous/shrub wetlands at a 1:1 ratio would not meet the minimum Corps mitigation ratio. Annual monitoring of mitigation sites would ensure mitigation sites were dominated by appropriate vegetation and had comparable function and value to the affected wetlands.

In Alternatives 3 and 4, jurisdictional wetlands would be replaced at a ratio described in Alternative 2 while non-jurisdictional wetlands would be replaced at a 1:1 ratio. Where feasible, wetland soil, sod, and shrubs would be excavated from existing wetlands prior to filling during construction, and placed in the wetland mitigation areas. Sufficient mitigation sites have been identified for Alternative 3 to achieve the Corps' minimum ratios. Mitigation sites identified for Alternative 4 are insufficient to achieve the Corps' minimum ratios, and additional mitigation sites would be necessary if this alternative were permitted.

The effect on wetland, spring, and seep habitat overlying the mine would be the same in Alternatives B, C, and D. The effect on wetlands, springs, and seeps overlying the mine and

downstream of the tailings impoundment is difficult to predict. The effect on plant species, functions, and values associated with the affected wetlands, springs, or seeps by a change in water level would be best determined by relating plant species with water abundance and quality for monitoring and evaluation. Alternative 2 does not include a survey of plant species abundance (all species) prior to activity and subsequent plant species abundance and water monitoring of ground water-dependent ecosystems overlying the mine. Without this type of monitoring, mining-induced changes in water level or quality may result in a loss of species, functions, and values associated with the affected wetlands, springs, or seeps. Additional monitoring of wetlands, springs, and seeps overlying the mine area and tailings impoundment sites would be conducted in Alternatives 3 and 4.

Draft Findings for Transmission Line Certification Approval

This section summarizes the effects of the transmission line and serves as the draft findings for transmission line certification approval. The DEQ will approve a transmission line facility as proposed or as modified or an alternative to the proposed facility if it finds and determines:

- The need for the facility
- The nature of probable environmental impacts
- That the facility minimizes adverse environmental impact, considering the state of available technology and the nature and economics of the various alternatives
- What part, if any, would be located underground
- That the facility is consistent with regional plans for expansion of the appropriate grid of the utility systems serving the state and interconnected utility systems
- That the facility will serve the interests of utility system economy and reliability
- That the location of the proposed facility conforms to applicable state and local laws
- That the facility will serve the public interest, convenience, and necessity
- That DEQ has issued all necessary decisions, opinions, orders, certifications, and permits
- That the use of public lands for location of the facility was evaluated, and public lands were selected whenever their use is as economically practicable as the use of private lands (75-20-301[1], MCA)

Need

In order to determine that there is a need for the proposed electric transmission line, the DEQ must make one of the findings enumerated in ARM 17.20.1606. No electrical distribution system is near the project area. The nearest electrical distribution line parallels U.S. 2 and it is not adequate to carry the required electrical power. The lead agencies considered, but eliminated from detailed analysis, alternatives other than a new transmission line. A new transmission line is needed to supply electrical power to construct, operate, and reclaim the proposed mine facilities.

Probable Environmental Impacts

The probable environmental impacts of the transmission line are described in Chapter 3. The following sections summarize selected effects of the North Miller Creek Alternative (Alternative B) as proposed by MMC along with the agencies' alternatives: Modified North Miller Creek

Alternative (Alternative C), Miller Creek Alternative (Alternative D), and West Fisher Creek Alternative (Alternative E) using the preferred location criteria listed in DEQ Circular MFSA-2, section 3.1. These criteria are:

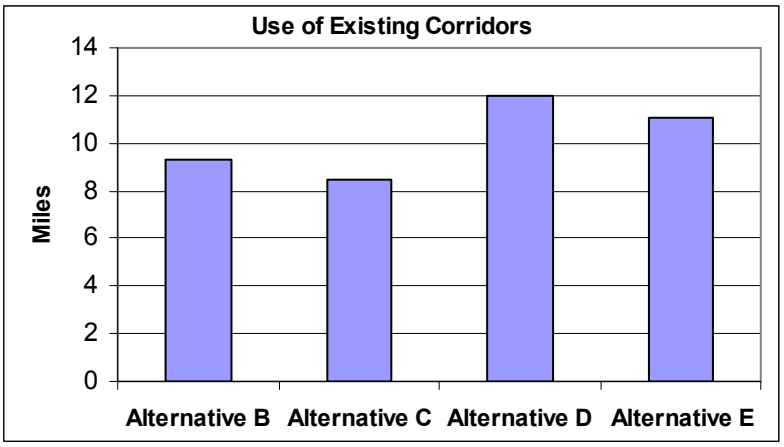
- Where there is the greatest potential for general local acceptance of the facility
- Where they use or parallel existing utility and/or transportation corridors
- Locations in non-residential areas
- Locations on rangeland rather than cropland and on non-irrigated or flood irrigated land rather than mechanically irrigated land
- Locations in logged areas rather than undisturbed forest
- Locations in geologically stable areas with non-erosive soils in flat or gently rolling terrain
- Locations in roaded areas where existing roads can be used for access to the facility during construction and maintenance
- Structures not located on a floodplain
- Where the facility will create the least visual impact
- A safe distance from residences and other areas of human concentration
- In accordance with applicable local, state, or federal management plans when public lands are crossed

None of the transmission line alternatives would cross rangeland or cropland. This preferred criterion is not discussed further. Alternative A, No Transmission Line, would not require the construction and operation of a transmission line. Electrical power would be provided by generators. The No Transmission Line Alternative would not provide a safe and reliable source of electrical power for the mine. Alternative A is not discussed in the following sections on the preferred location criteria.

General Local Acceptance. Issues and concerns about the proposed transmission line were identified during the public involvement process, discussed in Chapter 1. A public meeting on the proposed 230-kV transmission line was held in May 2005 to identify resources potentially affected by the proposed transmission line, suggested locations for the proposed line, alternatives to the proposed line, and mitigation measures for the proposed line. At the meeting, MMC presented information on the need for the proposed facility. Before making its minimum impact determination, the DEQ has solicited additional public comments on impacts of the alternatives as well as the balancing of preferred location criteria, possible impacts resulting from each alternative, and the use of public lands with project costs.

Use of Existing Corridors. No existing transmission line corridors are found in the analysis area. Existing transportation corridors consist of U.S. 2 and open roads on National Forest System lands, such as National Forest System road #231 or #278, and open roads on Plum Creek lands. Alternatives B through E would use or parallel existing road corridors. Alternatives B and C would be similar, with 8 to 9 miles of centerline within 1,000 feet of an existing open road. Alternatives D and E would make greater use of existing corridors, with between 11 and 12 miles centerline within 1,000 feet of these roads.

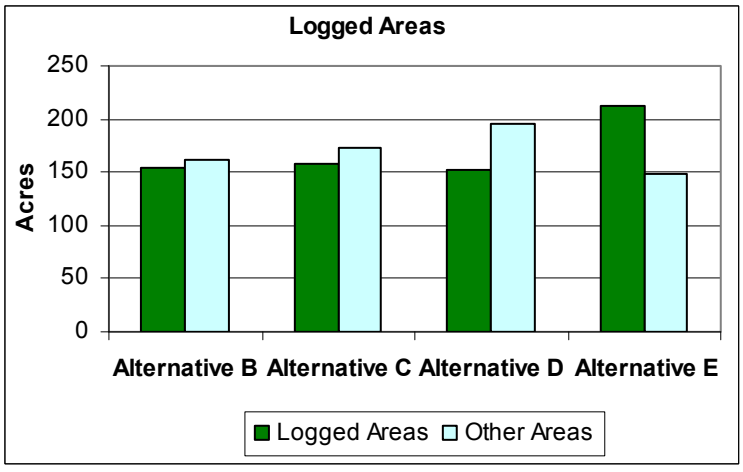
Location in Non-residential Areas. Most of the transmission line corridors are National Forest System lands or private lands owned by Plum Creek Timber Company. Residential areas are not found on either type of land. Fourteen residences are within 1 mile of the four transmission line alternatives. Most of these properties are within 0.5 mile of U.S. 2. Alternative B would be close to more residences than the other three alternatives. Fourteen residences are within 0.5 mile of Alternative B, of which 11 are greater than 450 feet from the centerline of the ROW and the remaining three are within 450 feet.



The seven residences within 0.5 mile of Alternatives C and D are more than 450 feet from the centerline. Six residences are within 0.5 mile of Alternative E, of which four are more than 450 feet from the line and the remaining two are within about 450 feet of the centerline. Montana regulations allow the final centerline to vary by up to 250 feet of the centerline analyzed in this EIS (ARM 17.20.301 (21)), unless there is a compelling reason to increase or decrease this distance. The centerline during final design of this alternative would be no closer than 200 feet of these residences.

Expected noise levels at a residence 400 feet from the centerline during a light rain or wet snows would be between 40 and 45 decibels. This sound level would be slightly above naturally occurring levels and would be faintly discernible. The sound level would be less than 20 decibels during fair weather, and would not be audible over existing sounds. Because BPA's Sedlak Park Substation would not contain a transformer, there would be no audible hum emanating from the substation.

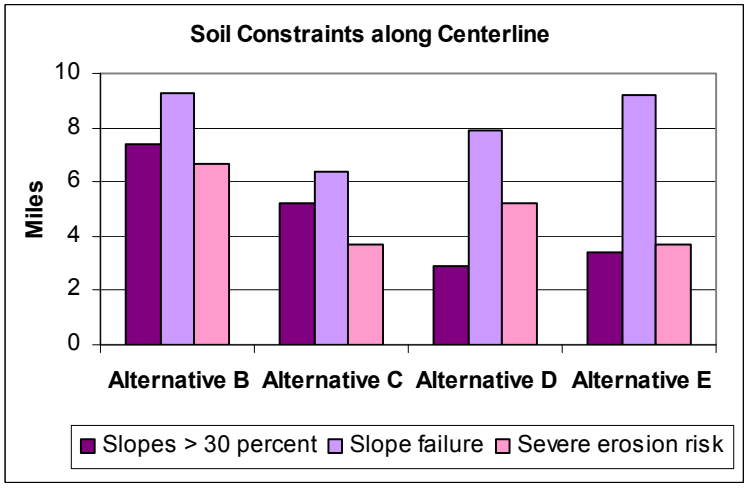
Logged Areas rather than Undisturbed Forest. Alternatives B through E would cross both logged areas and undisturbed forest, riparian, and other areas. About half the area crossed by Alternatives B and C has been logged. Alternative E would cross the most logged areas (210 acres) and least undisturbed areas (150 acres). Alternative D would cross the least logged areas (150 acres) and most undisturbed areas (195 acres).



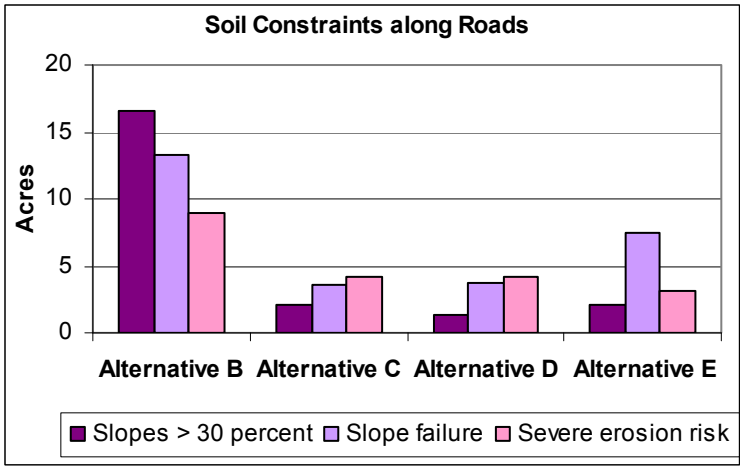
Geologically Stable Areas with Non-erosive Soils in Flat or Gently Rolling Terrain. The terrain in the transmission line analysis area consists of relatively flat alluvial valleys along major creeks and rivers, such as the Fisher River, Miller Creek and West Fisher Creek, or steep hillsides with

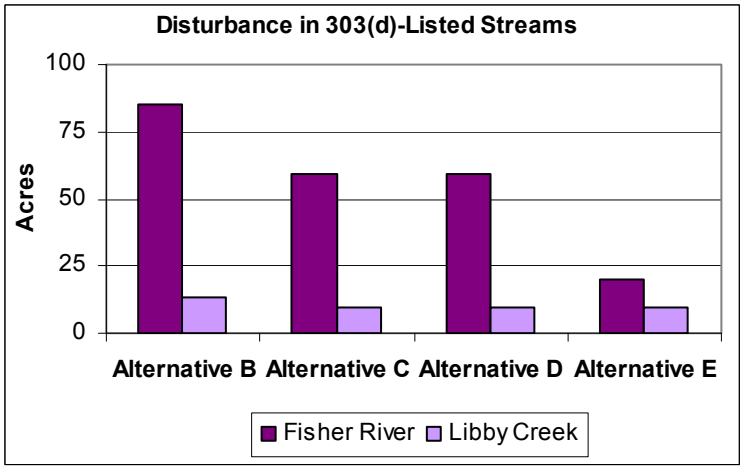
slopes greater than 30 percent. Soils subject to slope failure are found throughout the analysis area, primarily on lower hillslopes. Erosive soils are found along the Fisher River, Miller Creek, and West Fisher Creek.

Of the four alternatives, the centerline of the transmission line of the Alternative B would cross more steep areas (7.4 miles), more soils with a severe erosion hazard (6.7 miles), and more soils subject to failure (9.3 miles) than the other three alternatives. The centerline of Alternatives D and E would cross the least amount of steep slopes, crossing 3 miles of such slopes. The centerline of Alternative C would cross the least amount of soils subject to slope failure.



New or reconstructed access roads also would be needed on all transmission line alternatives. Alternative B would have more access roads than the other alternatives. In Alternatives C through E, the need for access roads would be reduced by using a helicopter to set structures in areas of poor accessibility. The access roads in Alternative B would disturb 8.9 acres of soil having severe erosion risk, 13.3 acres of soil having potential for slope failure, and 16.5 acres of slopes greater than 30 percent. Because of the fewer roads in the other alternatives, roads would disturb less than 5 acres of soils with these constraints in Alternatives C and D; Alternative E would disturb 7.4 acres of soils with risk of slope failure.

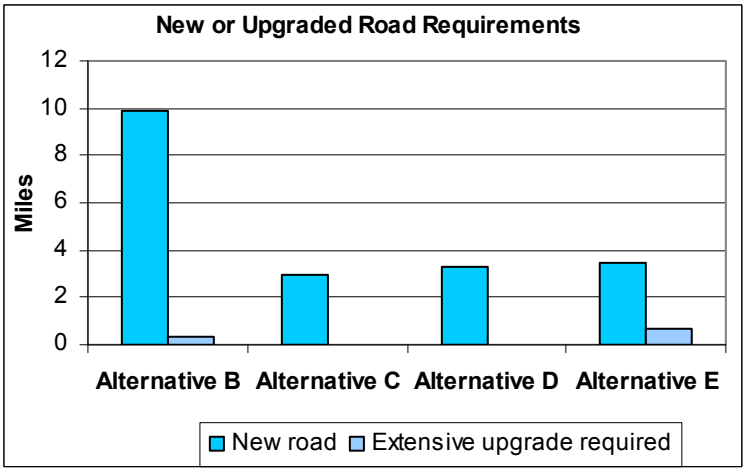




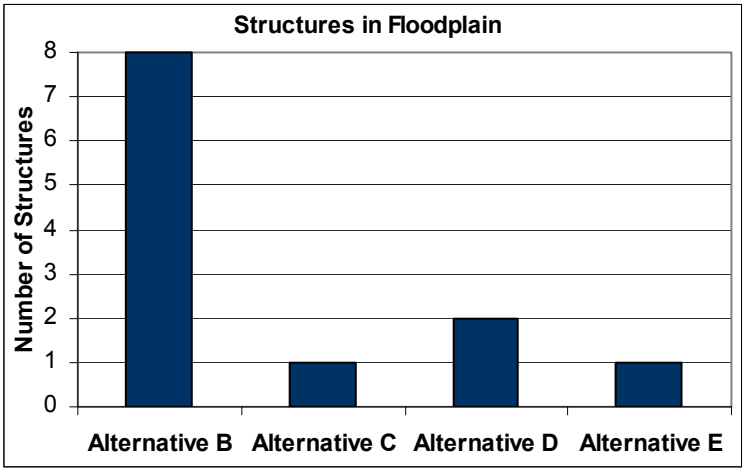
A segment of Libby Creek and the Fisher River are on Montana's list of impaired

streams. Alternative 2 would have 4.7 miles of line paralleling the Fisher River, where soils with severe erosion risk and high sediment delivery are found. Clearing for the transmission line and new or upgraded roads would disturb 85 acres in the watershed. Alternative 2 also would disturb 13 acres in the Libby Creek drainage. The soils at the Libby Creek crossing have severe erosion risk and high sediment delivery. Alternatives C and D would have fewer disturbances in the watersheds of 303(d)-listed streams, disturbing 59 acres in the Fisher River watershed and 10 acres in the Libby Creek watershed. Alternative E would have fewer disturbances in the Fisher River and Libby Creek watersheds than the other alternatives, disturbing 20 acres in the Fisher River watershed, and 10 acres in the Libby Creek watershed. Based on the use of best management practices (BMPs), Environmental Specifications, and other design criteria, these sediment increases would have minimal effects on analysis area streams under most conditions.

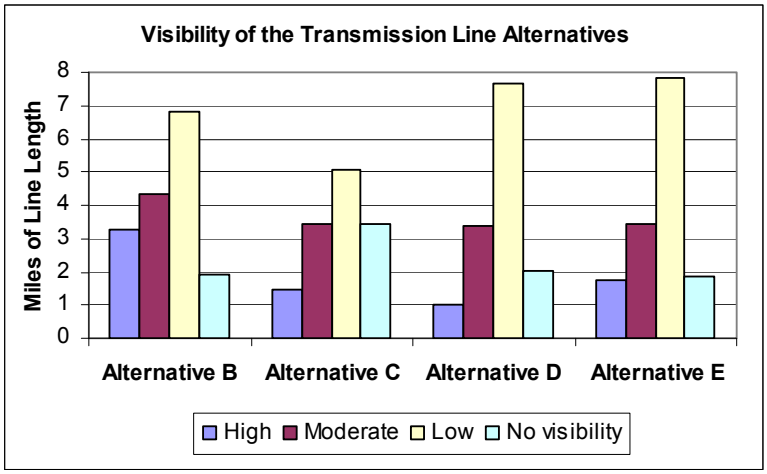
Roaded Areas. Existing roads are found throughout the transmission line analysis area. Most of the roads were used for timber harvest and are currently closed. Four open roads would be used as primary access by one or more the transmission line alternatives: U.S. 2, National Forest System road #231 (Libby Creek Road), National Forest System road #385 (Miller Creek-West Fisher Road), and National Forest System road #4724 (South Fork Miller Creek Road). Alternative B would require about 10 miles of new or roads with extensive upgrade requirements. In Alternatives C through E, the need for access roads would be reduced by using a helicopter to set structures in areas of poor accessibility. These alternatives would need 3 to 4 miles of new or upgraded roads.



Structures in a Floodplain. One-hundred-year floodplains have been designated along the Fisher River, Miller Creek, an unnamed tributary to Miller Creek, Ramsey Creek, and Libby Creek. Eight structures in Alternative B would be located in a designated 100-year floodplain, primarily along the Fisher River. One or two structures would be located in a designated 100-year floodplain in the other three alternatives.

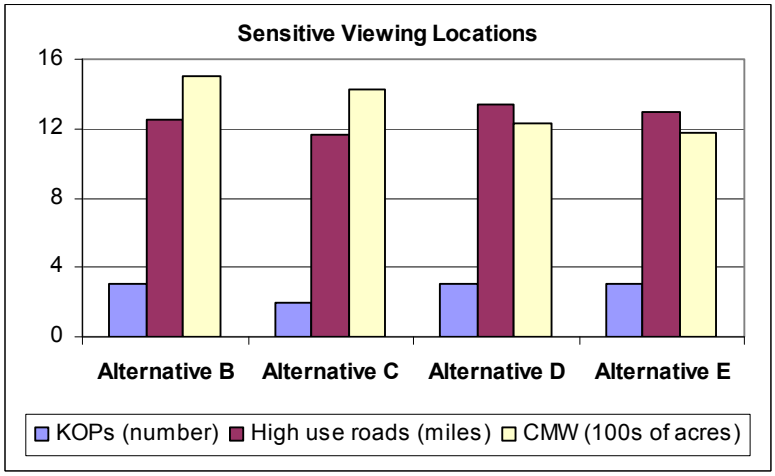


Visual Impact. The analysis area is characterized visually by the summit peaks of the Cabinet Mountains surrounded by the adjacent densely forested mountains and valleys, with some flat, open creek or stream valleys of dense low-growing herbaceous vegetation interspersed with the forest. The four transmission line alternatives would be located in montane forest and valley characteristic landscapes within the KNF.



About 3.3 miles of Alternative B would have a high visual impact and 4.4 miles would be moderate. Two miles of Alternative B would not be visible. Alternatives C, D, and E would have similar lengths of high and moderate visibility. Alternative C would have the greatest length of transmission line without any visibility at 3.4 miles.

All alternatives would be visible from KOPs, high use roads, and the CMW. Alternative C would be visible from the fewest KOPs (2) and high use roads (12 miles). Alternatives B, D, and E would be visible from two KOPs. Visibility from high use roads would be the greatest in Alternative D. Effects of views from the CMW would be the greatest in Alternative B and the least in Alternative E.



Safe Distance from Residences and Other Areas of Human Concentration. Fourteen residences are present within 0.5 mile of Alternative B, of which 11 are greater than 450 feet from the centerline of the right-of-way and the remaining three are within 450 feet. Because the final alignment could vary by up to 250 feet of the centerline analyzed in this EIS (ARM 17.20.301 (21)), three residences may be within 200 feet of the centerline depending on final transmission line alignment. At lateral distances from the edge of the right-of-way (50 feet from the centerline) to 200 feet away, the electric field strength would range from about 0.75 kV/m (kilovolt/meter) at 50 feet to about 0.05 kV/m (or 50 V/m) at 200 feet. The magnetic field strength would be about 4 milligauss (mG) at 50 feet and less than 1 mG at 200 feet. This maximum electric strength at 50 feet would be below the level set by Montana regulation for electric field strength, and both the electric and magnetic field strengths at 50 feet would be below the exposure levels for the general public recommended as reference levels or maximum permissible levels.

The seven residences along Alternative C and the eight residences along Alternative D within 0.5 mile are greater than 450 feet from the centerline. Seven residences are within 0.5 mile of Alternative E centerline, of which five are more than 450 feet from the centerline and the remaining two are within 450 feet of the centerline. As part of this alternative, the centerline would be not closer than 200 feet from any residence during final design. The electric field strength would be less than 0.05 kV/m (or 50 V/m) and the magnetic field strength would be less than 1.0 mG. Based on the electric and magnetic field strengths recommended in guidelines as reference levels or maximum permissible levels for the general public, and the current state of scientific research on electric and magnetic fields, these alternatives would be a safe distance from residences and other areas of human concentration.

If approved, the DEQ would require that the project meet minimum standards set forth in the National Electrical Safety Code and Federal Aviation Administration requirements for marking the line.

Compliance with Local, State, or Federal Management Plans. The KFP guides all natural resource management activities and establishes management direction for the KNF in the form of prescriptions consisting of goals, objectives, standards, and guidelines. This direction may be established to apply throughout the forest plan area (forest-wide direction), or it may be established for only a part of the forest plan area, a MA. The Montanore Project is being evaluated under the 1987 KFP. Unincorporated Lincoln County has no comprehensive or general plan, zoning regulations, or growth policies.

The Montana Fish, Wildlife and Parks (FWP) holds a conservation easement on some lands owned by Plum Creek Timber Company where the transmission line may be located. Under the terms of the conservation easement, the FWP has reserved the right to prevent any inconsistent activity on or use of the land by Plum Creek Timber Company or other owners and to require the restoration of any areas or features of the land damaged by such activity or use. Activities and uses prohibited or restricted include installing any natural gas or other pipelines or power transmission lines greater than 25-kV unless the prior written approval is given by the FWP.

Alternative B would not be in compliance with all goals, objectives, standards, and guidelines of the KFP. For example, Inland Native Fish Strategy standard Minerals Management (MM-2) requires all structures, support facilities, and roads be located outside RHCAs. Where no alternative to siting facilities in RHCAs exists, operators are to locate and construct the facilities in ways that avoid impacts to RHCAs and streams and adverse effects on inland native fish. MMC's Alternative B would locate roads and transmission line structures in RHCAs. The lead agencies' modifications to MMC's proposed alignment and structure placement are incorporated into Alternative C, which would reduce the number of roads and transmission line structures in RHCAs. Compliance with the KFP is discussed in each resource section of Chapter 3. If the selected transmission line were approved by the FWP, it would be in compliance with the FWP-Plum Creek conservation easement.

Minimized Adverse Environmental Impact

The MFSA requires a finding that the facility as proposed or modified or an alternative to the facility must minimize adverse environmental impacts, considering the state of available technology and the nature and economics of the various alternatives(75-20-301(1)(c), MCA). ARM 17.20.1607 outlines additional requirements before this finding can be made. In addition,

the final location for the facility must achieve the best balance among the preferred site criteria discussed in the previous section.

In addition to the DEQ's preferred location criteria listed in DEQ Circular MFSA-2, section 3.1, transmission line impacts also were evaluated based on criteria listed in DEQ Circular MFSA-2, sections 3.2(1)(d)(iii) through (xi) and 3.4(1)(b) through (w) (see Appendix J) and other criteria established to meet Forest Service and NEPA requirements. Alternative A, No Transmission Line, would not have additional effects beyond that described for the mine, and is not discussed further. Impacts of transmission line alternatives are summarized below, based on the criteria listed in Appendix J. Other key issues addressed as required by the Forest Service or NEPA are discussed where they relate to DEQ Circular MFSA-2 criteria. Additional Forest Service or NEPA issues that do not fit in the context of MFSA criteria are discussed at the end of this section. Of the key issues identified by the KNF and the DEQ, the transmission line alternatives would have no effect on acid rock drainage, metal leaching, ground water quality or quantity, or surface water quantity, and these issues are not discussed further. The proposed transmission line would have no effect for the following resources listed in DEQ Circular MFSA-2 criteria: national primitive areas; national wildlife refuges and ranges; state wildlife management areas and wildlife habitat protection areas; national parks and monuments; state parks; national recreation areas; designated or eligible wild and scenic river systems; specifically managed buffer areas; state or federal waterfowl production areas; designated natural areas; national historic landmarks, districts, or sites; municipal watersheds; sage and sharp-tailed grouse breeding areas and winter range; high waterfowl population areas; areas of unusual scientific, educational, or recreational significance; areas of high probability of including significant paleontological resources; water bodies; potable surface water supplies, or active faults.

National Wilderness Areas. None of the alternatives would directly affect the wilderness attributes of the Cabinet Mountains Wilderness. Indirect effects to the Cabinet Mountains Wilderness are discussed below for Scenic Quality.

Roadless Areas over 5,000 acres. Alternative B would physically disturb 2 acres of the Cabinet Face East IRA in the Ramsey Creek drainage. Timber harvest for line clearing would occur in the IRA, and 0.1 mile of new roads would be constructed in the IRA under Alternative B. Alternatives C, D, and E would avoid physical disturbance in the Cabinet Face East IRA. No road construction or timber harvest would occur in the IRA.

Rugged Topography, Soil Erosion, and Sediment Delivery. The centerline of Alternative B would cross more areas with slopes greater than 30 percent (7.4 miles), more soils with a severe erosion hazard (6.7 miles), and more soils with high sediment delivery (5.1 miles) than the other three alternatives. The total disturbance for access roads, which would be either new roads or closed roads requiring upgrades, would be greater in Alternative B (30.9 acres) than the other alternatives, followed by Alternative E (12.7 acres). Of the agencies' alternatives, Alternative C would cross the most areas with slopes greater than 30 percent (5.2 miles), Alternative D would cross the most soils with a severe erosion hazard (5.2 miles), and Alternatives C and D would cross the most soils with high sediment delivery (1.5 miles). Slopes greater than 30 percent, areas with severe erosion hazard, and areas with high sediment delivery are shown for all transmission line alternatives in Appendix J.

To minimize erosion risk and sediment delivery, Alternative B would include implementation of erosion and sediment control BMPs; interim reclamation (replacing soil where it was removed

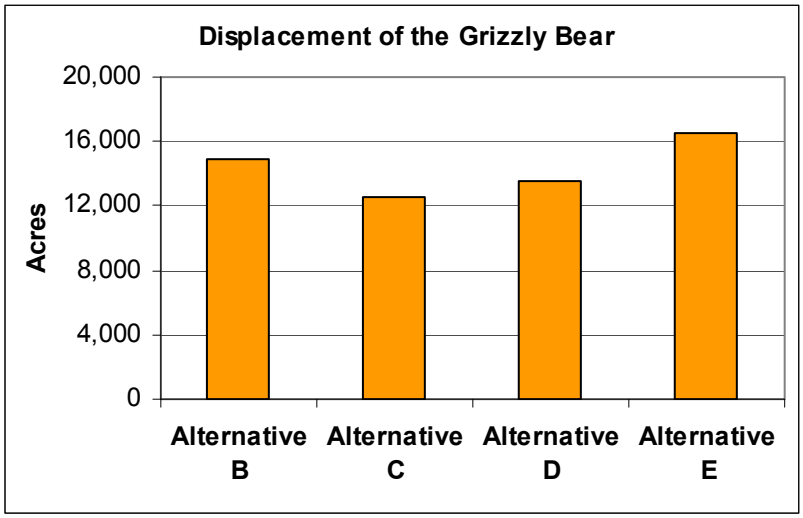
and reseeding) of access roads; immediate stabilization of cut-and-fill slopes; seeding, application of fertilizer, and stabilization of road cut-and-fill slopes and other disturbances along roads as soon as final post-construction grades were achieved; at the end of operations, decommissioning of new roads and reclamation of most other currently existing roads to pre-operational conditions; ripping of compacted soils prior to soil placement, and disking and harrowing of seedbeds. In addition to measures listed for Alternative B, Alternatives C, D, and E would minimize erosion risk and reduce sediment delivery through: re-routing to avoid highly erosive soils; use of H-frame poles, allowing longer spans and fewer structures and access roads; helicopter construction in grizzly bear core habitat to decrease number of access roads; and implementation of a Road Management Plan. For all transmission line alternatives, with implementation of mitigation measures there would be no severe reclamation constraints, no significant adverse impacts to the soil resources, and the soil losses along access roads would likely be minor until vegetation was re-established in most areas after 3 to 5 years. Vegetation re-establishment on steep areas, particularly on south- and west-facing slopes, would take longer.

Bull Trout Critical Habitat and Occupied Habitat and other Fisheries. The Fisher River, West Fisher Creek, Libby Creek, and Ramsey Creek in the transmission line analysis area provide habitat for bull trout, listed as threatened under the ESA. Critical bull trout habitat is found in two segments of West Fisher Creek, 1 to 2 miles west of U.S. 2. Because of barriers, bull trout are not found in Miller Creek or its tributaries.

Bull trout could be affected by increased sedimentation caused by clearing, road construction, and other disturbance associated with the transmission line. All alternatives may affect bull trout and designated critical habitat. All alternatives would cross Howard and Libby creeks 0.3 to 0.4 mile upstream of designated critical habitat on Libby Creek. Alternative E would parallel the designated critical bull trout habitat in West Fisher Creek. The existing Libby Creek Road (National Forest System road #231) would be between the line in Alternative E and any new roads, and West Fisher Creek. As shown in Appendix J, Alternative E would have the most structures within 1 mile of bull trout critical habitat (28), and Alternative B would disturb the most habitat for road construction and upgrades within 1 mile of bull trout critical habitat (3.5 acres). Alternative D would have the fewest structures within 1 mile of bull trout critical habitat (6), and disturb the least habitat for road construction and upgrades within 1 mile of bull trout critical habitat (0.6 acres). Alternative B would result in the most disturbance from clearing and road construction or upgrades in watersheds of occupied bull trout streams (181 acres), followed by Alternative E (179 acres). Alternative D would result in the least disturbance in watersheds of occupied bull trout streams (84 acres).

Three Montana fish Species of Concern are found in the transmission line analysis area streams: interior redband trout, westslope cutthroat trout, and torrent sculpin. Pure populations of interior redband trout are found in the Fisher River, West Fisher Creek, Ramsey Creek, a short segment of Libby Creek below Ramsey Creek, and Midas Creek. Torrent sculpin are found in Libby Creek and Miller Creek. Both torrent and slimy sculpin are found in analysis area streams and cannot be readily identified based on external morphology. Westslope cutthroat trout are found in Howard Creek and Miller Creek. Fish species of concern also are found in Midas Creek and Standard Creek. The transmission line alternatives would result in only minor disturbance in these watersheds, which is unlikely to affect aquatic life. None of the transmission line alternatives would likely contribute to a trend toward federal listing or cause loss of viability of the population of westslope cutthroat trout or interior redband trout.

In addition to mitigation measures described above to minimize erosion and sediment delivery, Alternative B would include implementation of a Storm Water Pollution Prevention Plan and structural and non-structural BMPs; construction of stream crossings per KNF and DEQ requirements; minimization of disturbance on active floodplains; and curtailment of construction activities during heavy rains. Alternatives C, D, and E also would include the following measures: where feasible, location of structures outside of riparian areas; installation of new culverts to allow fish passage; design of stream-crossing structures to withstand a 100-year flow event; and the completion of a habitat inventory and development of instream structures in Libby Creek. Based on the use of BMPs, Environmental Specifications, and other design criteria, sediment increases would have minimal effects on analysis area streams under most conditions.



Grizzly Bear. As discussed in the previous summary of the mine alternatives, an analysis of the independent effects of the transmission line alternatives on the grizzly bear was not completed because of the analysis' complexity. The effects of the combined mine and transmission line alternatives have been discussed previously. The following is an estimate of the effects of the transmission line alternatives. The physical loss of grizzly bear habitat would be low, ranging from 13 to 14 acres in Alternatives C, D, and E to 40 acres in Alternative B. Physical loss would be primarily from construction of roads and the Sedlak Park Substation. The grizzly bear would be displaced temporarily from habitat in all alternatives, ranging from 12,582 acres in Alternative C to 16,501 acres in Alternative E. Some areas affected by displacement from transmission line activities are currently being affected by other activities, such as road use. In all alternatives, displacement effects would be primarily due to helicopter activity. In all alternatives, helicopters would be used for line stringing, which would last about 10 days. In Alternatives C, D, and E, helicopters also would be used in some segments for vegetation clearing and structure construction, prolonging disturbance for up to 2 months. For all alternatives, disturbance of a similar duration also would occur during other transmission line construction activities in areas where helicopters were not used, and would be more extensive for Alternative B than Alternative C, D, or E. For all transmission line alternatives, except for annual inspection and infrequent maintenance operations, helicopter use and other transmission line construction activity would cease after the transmission line was built until decommissioning. Helicopter use and other transmission line construction activities would cause similar disturbances with similar durations during line decommissioning. Alternatives B and C would follow similar routes, with the exception of the segment of Alternative B in the Ramsey Creek drainage. Alternative C would increase short-term helicopter displacement effects during construction but would reduce road requirements relative to Alternative B. Effects on the grizzly bear would be mitigated through habitat acquisition, access changes, and habitat enhancement.

Small, isolated blocks of core habitat may provide lower quality habitat than large, interconnected blocks. Research suggests that grizzly bears prefer larger blocks of core, although a minimum block size was not determined due to small sample sizes (Wakkinen and Kasworm 1997). During transmission line construction, new road construction in Alternative B would divide and reduce a block of core habitat in the northeast portion of BMU 6, where a narrow band of core habitat occurs, resulting in one large block and two smaller blocks. Core habitat fragmentation would continue until the transmission line was decommissioned in Alternative B. The transmission line alignment in Alternative C would cross the block of core habitat in the northeast portion of BMU 6, but would not reduce core habitat because helicopters would be used for construction in or adjacent to core habitat. Displacement effects from helicopter activity during construction, annual maintenance throughout the project, and transmission line decommissioning in Alternatives B and C would reduce effectiveness of this core habitat block. In Alternatives B and C, core habitat would be altered with a linear transmission line corridor, reducing cover and increasing forage habitat. Clearing of the transmission line corridor could result in improved hunter access, increasing mortality risk.

Alternatives C, D, and E include an access change in NFS road #4725 that would enlarge a block of core habitat in the northeast portion on BMU 6. In Alternatives D and E, the access change would be in the entire length of NFS road #4725 and would be implemented before transmission line construction started. In Alternative C, the additional core habitat created by the access change in NFS road #4725 would be 320 acres smaller and would occur later than in Alternatives D and E. The entire length of NFS road #4725 would be used during construction of Alternative C, and the access change would occur in the upper 2.8 miles of NFS road #4725 after it was no longer needed for transmission line construction.

Canada Lynx. Impact evaluation criteria for the Canada lynx have been discussed in the previous summary of the mine alternatives. All transmission line alternatives would comply with Lynx Amendment standards with the following exception. All transmission line alternatives would affect multi-story or late-successional forest snowshoe hare (lynx denning) habitat and would not meet this standard. Impacts to lynx denning habitat would range from 19 acres for Alternatives C and D, to 31 acres for Alternative B (see Appendix J). Overall lynx habitat disturbed in the transmission line clearing area or for road construction or improvement would range from 79 acres for Alternative C to 193 acres for Alternative D. All transmission line alternatives may affect the Canada lynx. Land acquired for grizzly bear mitigation for the transmission line alternatives would likely improve habitat conditions for lynx and their prey.

Gray Wolf. Impact evaluation criteria for the gray wolf have been discussed in the previous summary of the mine alternatives. The Fishtrap pack is the only known wolf pack potentially affected by the Montanore Project. At least two wolves use portions of the analysis area on a regular basis. No wolf packs or den sites have been confirmed in this general area.

For all transmission line alternatives, sufficient populations of elk, deer and other prey species would continue to be maintained, and would continue to provide a good year-round prey base for wolves, and no known den or rendezvous sites would be affected by any of the transmission line alternatives. Only the outer edge of the Fishtrap pack territory extends to the extreme southeast portion of the analysis area and the Fishtrap pack would not likely be affected by any of the transmission line alternatives. High road densities and transmission line construction activities could have short-term effects on other wolves using the analysis area. Increased road densities, could result in increased potential for human disturbance and an increased risk of human-caused

wolf mortality. During transmission line construction, all transmission line alternatives except Alternative D would increase road densities in the analysis area. Road densities would increase the most for Alternative B. For all transmission line alternatives, open road densities on National Forest System lands would return to existing densities during transmission line operations and after reclamation. Helicopter use and other transmission line construction and ground construction activities could temporarily displace wolves from surrounding habitat. Impacts to wolf habitat would be somewhat reduced through the land acquisition programs proposed by MMC and the agencies especially where roads could be closed. In Alternatives C, D, and E, potential impacts to wolves would be minimized through road access changes that would create security habitat for prey species and reduce motorized access of wolf habitat, prohibiting employees to carry firearms, removing road-killed big game animals, implementing a transportation plan to reduce mine traffic, and monitoring road-killed animals. Overall, all transmission line alternatives would have a minimal effect on the gray wolf.

Cultural Resources. Four eligible cultural sites would be located in the Alternative B alignment and 500-foot buffer, while the buffer area for Alternatives C, D, and E would include three eligible cultural sites. Details about these sites are explained in Chapter 3. For all transmission line alternatives, consultation with the SHPO would be conducted to receive consensus determinations and to develop a plan of action for site 24LN1818. Site 24LN1818 is a portion of U.S. 2 that crosses Alternatives B, C, and D. Because of the ongoing highway modifications, the resource has not been evaluated for the National Register of Historic Places. Additional fieldwork would be necessary prior to SHPO consultation.

Surface Water Quality. Libby Creek, Ramsey Creek, Poorman Creek, Little Cherry Creek, Bear Creek, Howard Creek, and Midas Creek are rated as outstanding (Class 1) for fisheries habitat by the FWP. Clearing within watersheds of Class I or Class II streams would range from 47 acres for Alternatives C and D to 107 acres for Alternative B. Road construction and improvement would disturb less than 1 acre in watersheds of Class I or Class II streams for Alternatives C, D, and E, and 7 acres for Alternative B (see Appendix J).

Stream segments on Montana's 303(d) list of impaired streams in the analysis area are described in the previous summary of the mine alternatives. Clearing within watersheds of 303(d)-listed streams would range from 29 acres for Alternative E to 95 acres for Alternative B. Road construction and improvement disturbance in watersheds of 303(d)-listed streams would range from less than 1 acre for Alternative E to 4 acres for Alternative B (see Appendix J).

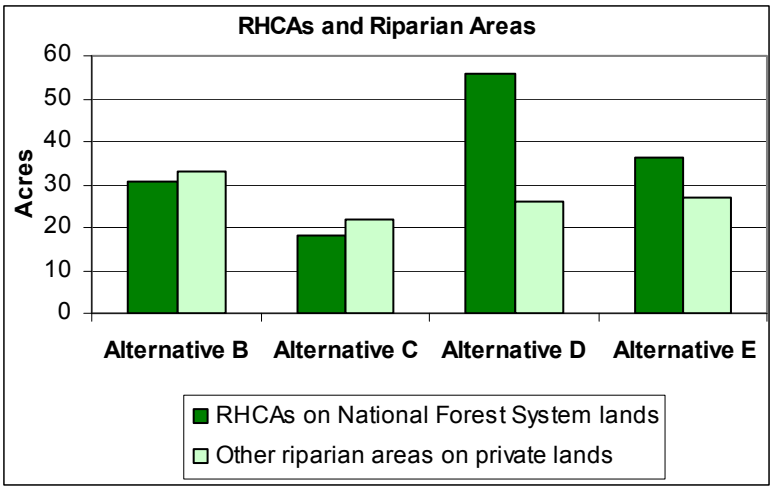
Scenic Quality. In transmission line Alternatives B, C, D, and E, the KNF would amend the KFP by reallocating certain areas disturbed by the 230-kV transmission line on National Forest System lands as MA 23. MA 23 has a Visual Quality Objective (VQO) of Maximum Modification. The MAs that would not be reallocated to MA 23 currently have a VQO of Maximum Modification. All transmission line facilities would be in compliance with a VQO of Modification or Maximum Modification. Some segments of all transmission line alternatives would be visible from some locations within the Cabinet Mountains Wilderness, as shown in Appendix J.

Big Game Winter and Security Habitat. All transmission line alternatives would disturb winter habitat for moose, elk, and white-tailed deer and security habitat for elk. Security habitat offers elk refuge and reduces their vulnerability during the hunting season. For this analysis, elk security habitat is defined as areas that are larger than 250 contiguous acres and more than 0.5 mile from an open road. Alternative C would disturb the most elk winter range (174 acres), and Alternative

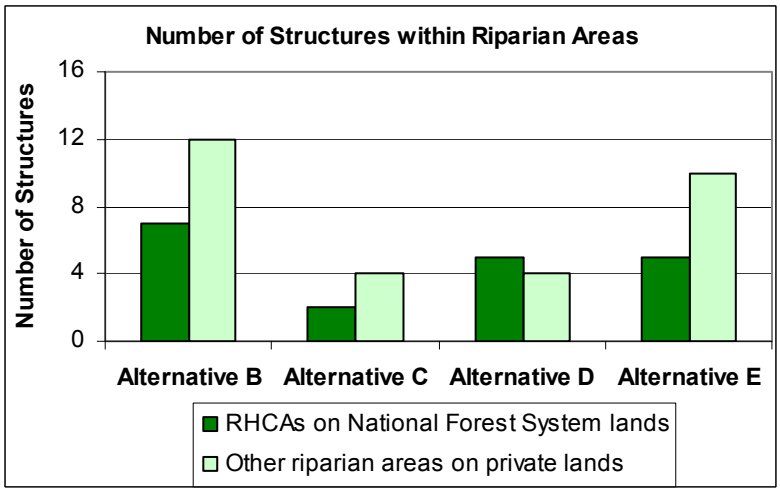
E would disturb the least (93 acres) (see Appendix J). Disturbance impacts to white-tailed deer winter range would range from 149 acres for Alternative B to 208 acres for Alternative D. The most moose winter range would be disturbed by Alternative E (210 acres) and the least by Alternative B (146 acres). Only Alternatives B and C would affect elk security habitat, disturbing 49 acres and 84 acres, respectively. For all transmission line alternatives, impacts to big game winter habitat would be mitigated through winter construction timing restrictions in white-tailed deer winter range. Land acquisition programs proposed by MMC and the agencies, especially where roads could be closed, also would mitigate impacts to big game. Additional mitigation measures included in Alternatives C, D, and E would be the creation of security habitat through road access changes and monitoring road-killed animals to determine if improved access results in increased wildlife mortality.

Mountain Goat. Only Alternative B would physically disturb mountain goat habitat, affecting 47 acres. Helicopter use and other transmission line construction activities associated with the transmission line alternatives are described above for grizzly bear. Helicopter and other transmission line construction activities could temporarily displace goats from suitable habitat or reduce their ability to effectively use the available habitat in the short term. Individual goats could suffer increased stress levels from helicopter and construction disturbance. During the construction phase, Alternative B would result in additional short-term disturbance to 3,877 acres of goat habitat, primarily due to helicopter line stringing in the Ramsey Creek area. Additional disturbance effects would be less for Alternatives C, D, and E, ranging from 624 acres for Alternative C to 729 acres for Alternatives D and E. Impacts to mountain goats could be reduced through land acquisition programs proposed by MMC and the agencies, if acquired land provides suitable goat habitat and could be managed to benefit mountain goats.

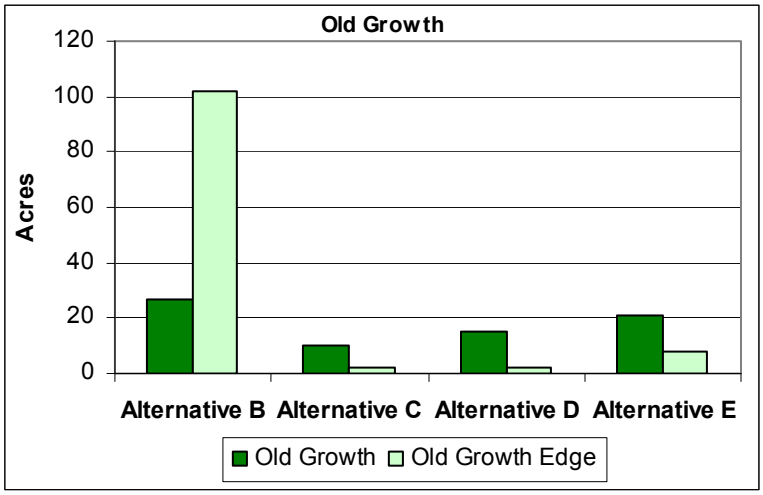
Riparian Habitat Conservation Areas. Alternatives B through E would require construction of roads and other facilities in RHCAs and other riparian areas. Protection of RHCAs was a key criterion in the alternatives analysis and development of alternatives. The lead agencies did not identify a practicable alternative that would avoid locating transmission line facilities or timber harvest in RHCAs. Effects on RHCAs would range from 18 acres in Alternative C to 56 acres in Alternative D; effects on riparian areas on state and private land would range from 22 acres in Alternative C to 33 acres in Alternative B. In Alternatives C, D, and E, MMC would develop and implement a final Road Management Plan to reduce effects on RHCAs. The plan would describe for all new and reconstructed roads criteria that govern road operation, maintenance, and management; requirements of pre-, during-, and post-storm inspection and maintenance; regulation of traffic during wet periods to minimize erosion and sediment delivery and accomplish other objectives;



implementation and effectiveness monitoring plans for road stability, drainage, and erosion control; and mitigation plans for road failures.



A KFP standard is to locate structures and support facilities, such as transmission line, outside of RHCAs, unless no alternative exists. Alternative B would have more structures located in RHCAs and other riparian areas, with seven structures on RHCAs and 12 structures on riparian areas on state and private land. Structures in RHCAs in the other alternatives would be fewer, ranging from two in Alternative C and five in Alternatives D and E. Similarly, fewer structures would be located in other riparian areas in the other alternatives, ranging from four in Alternatives C and D, and 10 in Alternative E. Effects on RHCAs in Alternatives C, D, and E would be minimized by development and implementation of a Vegetation Removal and Disposition Plan. Heavy equipment use in RHCAs would be minimized. Shrubs in RHCAs would be left in place unless they had to be removed for safety reasons.



Old Growth Habitat. Old growth in the transmission line corridors is found in small blocks along the Fisher River, Miller Creek, West Fisher Creek, and Libby Creek. Alternatives B through E would remove old growth and reduce the effectiveness of old growth adjacent to new disturbances. Loss of old growth would range from 10 acres in Alternative C to 27 acres in Alternative B. Edge effects would range from 102 acres in Alternative B to 2 acres in Alternatives C and D. Increased new road construction contributes to the edge effect of Alternative B. The reduction of old growth on National Forest System lands would be mitigated in Alternatives C, D, and E by the designation of undesignated old growth to designated old growth (MA 13).

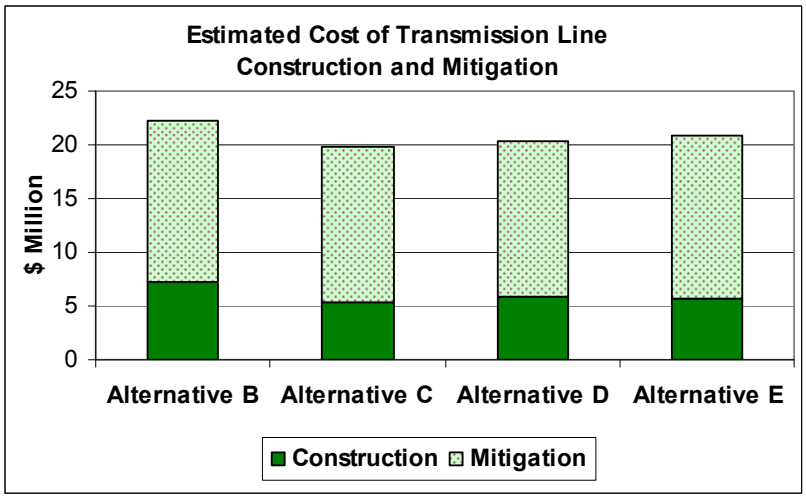
Transmission line Alternatives B through E would require a project-specific amendment to allow harvest within designated old growth stands (MA 13). The project-specific amendment would change the current MA 13 designation of all harvested stands to MA 23. Designation of additional areas of old growth would not create new old growth, but would ensure that these areas are managed to retain or develop old growth characteristics. Losses and degradation of old growth

habitat may be offset by private land acquisition associated with grizzly bear habitat mitigation, if old growth habitat characteristics were present on the acquired parcels. All alternatives would be consistent with KFP direction to maintain a minimum of 10 percent old growth below 5,500 feet in elevation in each 3rd-order drainage or compartment, or a combination of compartments.

Pileated Woodpecker. The pileated woodpecker is a Management Indicator Species (MIS) for old growth and snag habitat in the KNF. The effects on old growth in the transmission line alternatives, especially edge effects, would reduce nesting and foraging habitat and habitat quality for the pileated woodpecker. The potential population index in the transmission line alternatives would not be affected. All transmission line alternatives would result in the loss of snags and downed logs greater than 10 inches diameter at breast height that provide potential nesting and foraging habitat for pileated woodpeckers. Snag densities and quantities of down wood would remain above KNF-recommended levels and would continue to be sufficient to sustain viable populations of cavity-dependent species in the KNF. Loss of old growth providing potential pileated woodpecker habitat may be offset by private land acquisition associated with grizzly bear habitat mitigation, if old growth habitat characteristics were present on the acquired parcels and they could be managed to benefit pileated woodpeckers.

Wetlands. Direct effects to wetlands and waters of the U.S. are expected to be mostly avoided by placement and location of the transmission structures outside of wetlands and waters of the U.S. The BPA would avoid all wetlands at the Sedlak Park Substation Site. Unavoidable wetland direct effects would be determined during final design. No isolated wetlands were identified within the clearing area of any transmission line alternative. About 1.6 acres of wetlands would be within the Alternative B transmission line clearing area. No wetlands would be in the clearing area for Alternatives C, D, and E. Waters of the U.S. within the clearing area would range from 1.2 acres for Alternative C to between 8.2 and 10.2 acres for Alternatives B, D, and E. For all transmission line alternatives, new or upgraded road construction would affect less than 0.2 acre of wetlands and waters of the U.S. Indirect effects to wetlands from road construction, such as sediment or pollutant delivery, would be minimized through implementation of BMPs and appropriate stream crossings.

Transmission Line Construction Costs. Resource-specific impacts and cumulative impacts are described in the previous section and discussed in Chapter 3. Monetary values of these impacts cannot reasonably be quantified. Many potential adverse environmental impacts would be minimized through measures proposed by MMC and the application of the agencies' proposed measures that would be included in Environmental Specifications. Agency proposed mitigation measures would be included as conditions in the certificate should the DEQ approve the transmission line. Proposed Environmental Specifications for the transmission line, including environmental protection and monitoring measures, are described in Appendix D and are further detailed in ARM 17.20.1901.



Estimated transmission line construction costs range from $7.3 million for Alternative B to $5.4 million for Alternative C. High steel costs would make the steel monopoles proposed in Alternative B considerably more expensive than the wooden H-frame structures proposed in the other alternatives. The lower cost of wooden H-frame structures in Alternatives C, D, and E would offset the cost of helicopters to set structures and clear timber in these alternatives. Estimated mitigation costs range from $14.4 million for Alternative C to $15.0 million for Alternative E. Cost estimates are based on preliminary design and material costs in early 2008.

Locating Transmission Lines Underground

No part of the transmission line would be built underground. Digging trenches to bury the lines would require greater construction disturbance and would require longer time to install. The need for access roads and the associated surface disturbance would be greater. Except along the drainage bottoms, the analysis area is steep, with slopes greater than 30 percent common. Underground line installation and access road construction on steep slopes would have more environmental impact than above-ground construction. Above-ground access vaults would need to be constructed as well as above-ground structures at line termination points. Vegetation would likely have to be restricted to avoid reducing soil moisture needed to cool the transmission line. Problems with an underground system also would be more difficult to locate and repair. An underground transmission line would cost between 1.5 and 5 times the amount required to build an overhead line (Electric Power Research Institute 2006). Locating the transmission line underground was dismissed because of the greater surface disturbance and cost.

Consistency with Regional Plans for Expansion

The transmission line would allow the mine to connect to the regional electrical transmission grid. While there is no single formal published plan for expansion of the regional grid, the line would be consistent with plans for expansion of the BPA grid in the area. The line would not significantly add to the ability of the grid as a whole to deliver electricity because the purpose of the line would be to serve only the mine loads. The BPA has completed the studies necessary to interconnect the proposed line to BPA's Libby-Noxon 230-kV line. BPA's study indicated the proposed line would not have a significant effect on the interconnected system (Bonneville Power Administration 2006).

Utility System Economy and Reliability

The BPA has completed the study indicating that the proposed interconnection would not adversely affect BPA's system (Bonneville Power Administration 2006). Operating the proposed line at 230 kV would help ensure low line losses.

Conformance with Applicable State and Local Laws

The location of the facility would conform to applicable state and local laws and regulations either as a permitting or certification condition or in compliance with project-specific Environmental Specifications (see Chapter 1).

Public Interest, Convenience, and Necessity

The proposed transmission line would be built to meet the need for additional transfer capacity to the mine. Benefits to MMC would be the monetary profit from operating the mine and transmission line. Benefits to the state include local tax revenues to counties in which the line and mine are located, state tax revenues from the line and mine, a short-term beneficial effect on local economies from construction of the line and mine, and a long-term beneficial effect on local economies from maintenance of the line.

Economic impacts due to the proposed transmission line would be minimal at a state level. Construction benefits due to the line would be short-term. Line maintenance employment benefits and tax benefits would be long-term but small at both a county and state level. Total costs include mine and transmission line construction and operation costs and costs due to environmental impacts described in Chapter 3. Costs of these environmental impacts cannot be reasonably quantified in monetary terms.

The proposed transmission line is unlikely to have adverse affects on public health, welfare, and safety because the line would conform to the requirements of the National Electrical Safety Code and DEQ standards for electric field strength in residential or subdivided areas and at road crossings. Sensitive receptors such as residences would be located at distances sufficient that even the most restrictive suggested standards for magnetic fields would be met under normal operating conditions. Alternatives C, D, and E would be constructed in a manner that minimizes adverse impacts to soil, water, and aquatic resources.

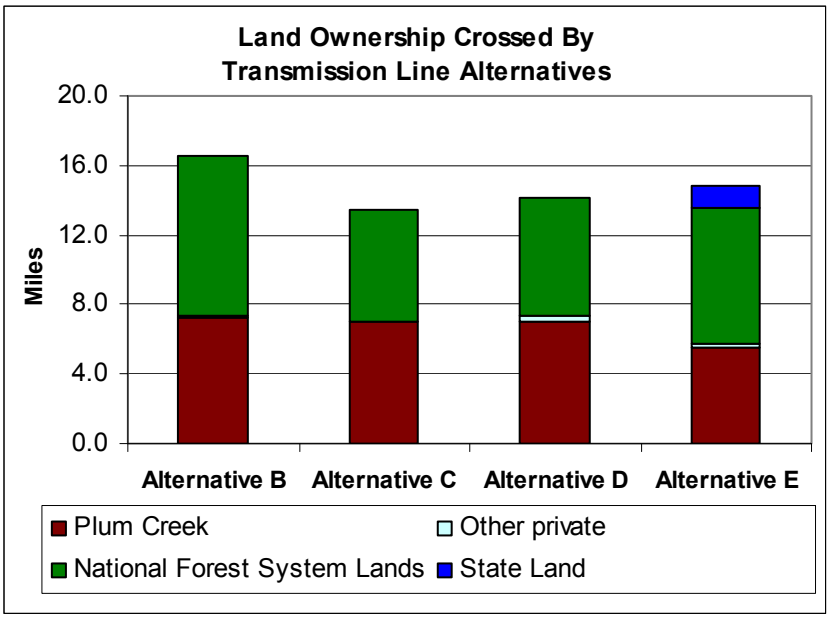
The DEQ will consider additional comments on the benefits and costs of the Montanore line, and will make a final determination on public interest, convenience, and necessity after comments on this Draft EIS are analyzed.

Public and Private Lands

The use of public lands for location of the facility was evaluated, and public lands were incorporated into alternatives whenever their use was as economically practicable as the use of private lands (75-20-301(1)(h), MCA). All of the transmission line alternatives would be located primarily on National Forest System lands and private land owned by Plum Creek. Alternative B, C, and D would cross between 7 and 7.4 miles of private and Plum Creek land. Alternative E would cross the least amount of private land (5.7 miles). The agencies did not identify an alternative that would avoid the use of private land.

DEQ Issuance of Necessary Decisions, Opinions, Orders, Certifications, and Permits

As appropriate, the DEQ would issue all necessary environmental permits for the transmission line at the time the decision is made on whether to grant a certificate for the facility.



Where to Obtain More Information

More information on the proposed Montanore Project can be found on the KNF's website: www.fs.fed.us/r1/kootenai/projects/projects/montanore/index.shtml, or the DEQ's website: http://www.deq.mt.gov/eis.asp. If you have any additional questions or concerns, please contact the individuals listed below.

Bobbie Lacklen
Kootenai National Forest
31374 U.S. 2 West
Libby, MT 59923-3022
(406) 293-6211

Bonnie Lovelace
Montana Department of Environmental Quality
PO Box 200901
Helena, MT 59620-0901
(406) 444-1760

Gene Lynard
Bonneville Power Administration
PO Box 3621
Portland, OR 97208-3621
(503) 230-7334