

Draft Environmental Impact Statement

Troy Mine Revised Reclamation Plan

May 2011



**Kootenai National Forest
Three Rivers Ranger District**

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Draft Environmental Impact Statement

Troy Mine Revised Reclamation Plan

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Abstract: This Draft Environmental Impact Statement for the Troy Mine Revised Reclamation Plan describes the land, people, and resources potentially affected by the proposed revised reclamation activities. The purpose of the proposed revision is to return lands disturbed by mining to a condition appropriate for subsequent use of the area. Alternatives considered in detail include a No Action Alternative (the previously approved 1978 reclamation plan), the Proposed Action (Troy Mine, Inc.'s Revised Reclamation Plan), and an Agency-Mitigated Alternative (the Agencies preferred alternative). This Draft EIS analyzes Troy Mine, Inc.'s revised plan as well as agency-proposed modifications (*e.g.* adit closure, mine water management, water treatment and monitoring, reclamation cover requirements, subsidence monitoring, debris disposal, and road closures). The major state and federal actions include approval of a reclamation plan and any necessary permits to implement the reclamation activities including construction and long-term monitoring.

Reviewers should provide their comments to either KNF or DEQ during the review period of the Draft EIS. The KNF and the DEQ will analyze and respond to the comments jointly and will use the information acquired in the preparation of the final environmental impact statement (Final EIS). Reviewers have an obligation to structure their participation in the National Environmental Policy Act (NEPA) and Montana Environmental Policy Act (MEPA) process so that it is meaningful and alerts the agencies to the reviewers' position and contentions [Vermont Yankee Nuclear Power Corp. v. Natural Resource Defense Council, 435 U.S. 519, 553 (1978)]. Environmental objections that could have been raised at the Draft EIS stage may be waived if not raised until after completion of the Final EIS. [City of Angoon v. Hodel (9th Circuit, 1986) and Wisconsin Heritages, Inc. v. Harris, 490 F. Supp. 1334, 1338 (E.D. Wis. 1980)]. Comments on the Draft EIS should be specific and should address the adequacy of the statement and the merits of the alternatives discussed (40 Code of Federal Regulations (CFR) 1503.3).

Send Comments To: Bobbie Lacklen (Kootenai National Forest) email: TroyMineReclamation@fs.fed.us or Emily Corsi (MT DEQ) email: deqTroyMine@mt.gov or postal addresses listed above.

Comments Due: 45 days after the Notice of Availability is published in the *Federal Register*, which will be on or about May 20, 2011.

Executive Summary

This Executive Summary provides an overview of the contents of the Draft Environmental Impact Statement (EIS) for the Troy Mine Revised Reclamation Plan. The Draft EIS describes the land, people, and resources potentially affected by the proposed revised reclamation activities. This summary does not provide all of the information contained in the Draft EIS. If more detailed information is desired, please refer to the Draft EIS, its appendices, or referenced reports.

ES.1 Introduction

The United States Department of Agriculture (USDA) Forest Service (USFS) Kootenai National Forest (KNF) and the Montana Department of Environmental Quality (DEQ) have prepared this EIS in compliance with the National Environmental Policy Act (NEPA), the Montana Environmental Policy Act (MEPA), the Metal Mine Reclamation Act (MMRA), and with other relevant federal and state laws and regulations.

In 1978, the Montana Department of State Lands (DSL) and KNF issued a Draft and Final EIS that addressed potential impacts from both the operation and reclamation of the Troy Mine, which is operated by Troy Mine, Incorporated (Troy Mine, Inc.). Troy Mine, Inc. was formerly known as Genesis, Incorporated, and documents prepared under the earlier name referenced in this Draft EIS are attributed to Genesis.

In the fall of 1999, DEQ and KNF (the Agencies) initiated a review of the Troy Mine reclamation bond. DEQ and KNF notified the mining company that the approved 1978 reclamation plan needed to be revised and a substantial bond increase would be required. The mining company prepared a revised reclamation plan and the final draft was submitted to the Agencies in March of 2006 (Genesis 2006). The 2006 Revised Reclamation Plan is the subject of this Draft EIS and is referred to as the Proposed Action.

ES.1.1 Project Area Description

The Troy Mine is located about 15 miles south of Troy, Montana, in Lincoln County (Figure ES-1). The nearest towns to Troy are Libby, Montana, located 18 miles to the east and Bonners Ferry, Idaho (ID), located 33 miles to the west. The project area lies within the KNF immediately west and north of Bull Lake and is within the Stanley, Lake, and Ross creek drainages.

The Troy Mine is accessible from Montana Highway 56 (MT 56) and National Forest System Road (NFSR) 4626. The mine permit area covers 2,782 acres of public, private, and patented land. Approximately 57 percent of the project area is on private and patented land, and the other 43 percent is on the KNF.

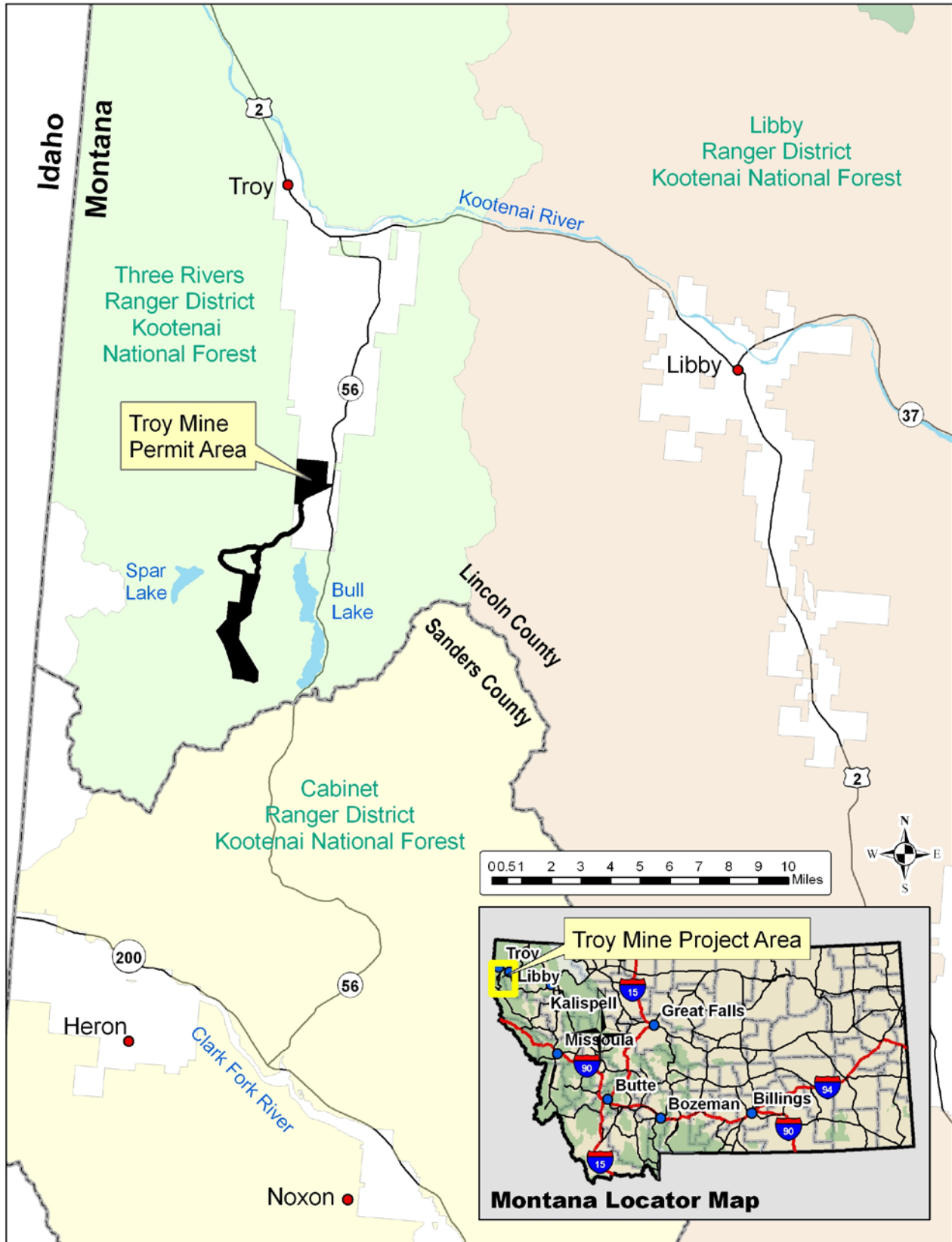


Figure ES-1. Project Area

The mine facilities consist of an underground mine, the mill, and various office facilities; the tailings and reclaim water pipelines; a power line; a tailings impoundment; and associated support facilities. The tailings facility and associated disturbances are on approximately 430 acres of disturbed area on private land owned by Troy Mine, Inc. Both the tailings and reclaim water pipelines and the power line are on National Forest System Lands (NFSL), private, and patented land. The South Adit portal is located on patented land, while the North Adit portal and the mill and office/shop facilities are located on unpatented claims on NFSL. There are approximately 15.6 acres of disturbed land at the portal patios and 34 acres of disturbed lands at the mill site. Associated roads, pipelines and other small disturbed areas exist throughout the project area.

ES.2 Purpose and Need

The purpose of the proposed reclamation plan is to return lands disturbed by mining to a condition appropriate for subsequent use of the area. The approved 1978 reclamation plan does not meet state or federal requirements for mine water discharge. The need for the revised reclamation plan stems from several objectives that need to be met after mine closure:

- Reclamation plans must meet state and federal requirements;
- Protection of surface and groundwater quality;
- Protection of public health and safety;
- Minimization of environmental risk; and
- Restoration of productive land use.

ES.3 Scope of Decisions To Be Made

The major state and federal actions include approval of a reclamation plan and any necessary permits to implement the reclamation activities including construction and long-term monitoring.

ES.3.1 Kootenai National Forest

KNF's required action is to respond to Troy Mine, Inc.'s request to approve the proposed Revised Reclamation Plan for the Troy Mine. To satisfy this request, KNF must:

- Select an alternative that meets the requirements of 36 Code of Federal Regulations (CFR) 228.8 which directs that all mining operations shall be conducted to minimize adverse environmental impacts on National Forest surface resources where feasible;
- Ensure implementation of the selected alternative would assist in preserving and maintaining forest resources to meet the long-term management goals of the 1987 Land and Resource Management Plan (Forest Plan), as amended; and
- Ensure compliance with other applicable federal laws.

KNF also has responsibility jointly with DEQ to review, analyze, and calculate the reclamation bond amount.

The KNF Forest Supervisor will use the EIS process to develop the information necessary to make an informed decision as required by 36 CFR 228, Subpart A. Based on the information presented and alternatives developed in this EIS, the KNF Forest Supervisor will issue a Record of Decision (ROD) on Troy Mine, Inc.'s proposal.

The ROD would document the Forest Supervisor decision on one of the following:

- No Action Alternative
- Approval of the Revised Reclamation Plan as submitted (the Proposed Action) as an amendment to the existing Plan of Operations for the Troy Mine, or
- Approval of a Revised Reclamation Plan (Agency-Mitigated Alternative), as an amendment to the existing Plan of Operations for the Troy Mine. The amendment would incorporate mitigations and stipulations to meet the mandates of applicable laws, regulations, and policies.

ES.3.2 Montana Department of Environmental Quality

DEQ's required action is to respond to Troy Mine, Inc.'s request to approve the proposed Revised Reclamation Plan for Troy Mine. To satisfy this request, DEQ must determine whether the Revised Reclamation Plan satisfies the requirements of the MMRA, Title 82, Chapter 4, Part 3, Montana Code Annotated (MCA).

The DEQ Director will use the EIS process to develop the information necessary to determine whether the Proposed Action meets the performance standards of the MMRA, including but not limited to:

- The removal of buildings and other structures at closure consistent with the post-mine land uses;
- Post-closure environmental monitoring programs and contingency plans;
- Compliance with state air and water quality standards.

The DEQ Director would issue a ROD documenting the decision on the reclamation proposal.

ES.4 Public Involvement

At the beginning of the NEPA/MEPA process, the Agencies conducted scoping to solicit public input on the purpose and need and the Proposed Action. A public scoping meeting was held in October 2007. The scoping process is described in a Scoping Report for the project. Based on the comments received during agency and public scoping, a number of major issues were identified that drove the development of alternatives to the Proposed Action.

At the time of the scoping, the project team determined that an environmental assessment (EA) would be produced to document the analysis. During the course of preparing the EA, several potential water quality issues were identified that are of sufficient significance to warrant the preparation of an EIS. These issues include the potential for mine water discharge to impact surface water and potentially

exceed aquatic life standards; the potential for the tailings pipeline to fail potentially resulting in erosion and discharge of contaminants into Stanley or Lake creeks; and issues related to the long-term maintenance of the pipeline. Given these potential issues, the Agencies issued a Notice of Intent to prepare an EIS in the Federal Register on April 14, 2011.

ES.5 Issue Identification and Alternative Development

Issues were identified through the agency and public scoping process, through the Agencies' review of the *2006 Revised Reclamation Plan*, and through interagency discussions on the development of alternatives. Issues were evaluated to determine whether the proposed action or an alternative would result in significant impacts. The Council on Environmental Quality (CEQ) regulations define significant impacts in terms of both context and intensity (40 CFR 1508.27). MEPA also provides direction on determining the significance of impacts similar to the definitions used under NEPA (ARM 17.4.608(1), MCA 75.1.201).

Major issues are those for which:

- there may be potentially significant impacts;
- there is a concern about potential effects directly or indirectly resulting from implementation of the Proposed Action; or
- there is a concern about the effectiveness of proposed mitigation measures.

The major issues identified include:

Water Management

- Adit closure and mine water distribution;
- Water treatment and disposal;
- Groundwater quality;
- Surface water quality; and
- Long-term monitoring of water quality

Reclamation

- Reclamation materials;
- Subsidence;
- Revegetation;
- Infrastructure (buildings and other structural materials and how they will be removed or reclaimed); and
- Topography (disturbed areas)

ES.6 Alternatives

Three alternatives were developed and evaluated in this EIS. The No Action Alternative consists of the 1978 Reclamation Plan that was previously approved and the reclamation work that has been

completed through August of 2010 by Genesis (now Troy Mine, Inc.). The Proposed Action describes the Revised Reclamation Plan submitted by Genesis to the Agencies in March of 2006. The Agency-Mitigated Alternative was developed by the Agencies and is based on issues derived from interagency and public scoping comments on the Proposed Action.

ES.6.1 No Action Alternative

The original reclamation plan was first analyzed in the *1978 Draft Environmental Impact Statement* (DSL and KNF 1978) and later approved by the Agencies. It does not directly address many of the issues identified through scoping.

ES.6.1.1 Water Management

Adit closure and mine water distribution

The No Action Alternative proposes to close the adits by plugging them with concrete. After mine closure, surface and groundwater would be expected to accumulate in the mine, eventually discharge onto the portal patios and infiltrate into groundwater, and ultimately enter Stanley Creek.

Water treatment and disposal

The No Action Alternative does not address water treatment.

Toe ponds at the base of the tailings impoundment capture seepage and embankment runoff which is then pumped to the impoundment. This pumping would not continue long-term after reclamation. Surface drainage would be from the low point of the impoundment surface to an appropriate natural drainage.

Groundwater quality

The No Action Alternative does not address groundwater quality beyond operational monitoring. Groundwater would enter the mine, flood the workings, and eventually exit the mine and discharge into the groundwater system and Stanley Creek.

Surface water quality

Under the No Action Alternative, seven existing water quality monitoring stations on Stanley, Fairway, and Lake creeks would continue to be sampled post-reclamation for flow and water quality three times per year until the Agencies agree that monitoring is no longer necessary.

Other than monitoring, management of water quality is not addressed under the No Action Alternative. Precipitation would enter the mine through fractures, the workings would flood, and the water would eventually exit the mine and discharge into Stanley Creek.

Long-term monitoring of water quality

Monitoring includes periodic water level and water quality sampling of monitoring wells, springs, and areas of groundwater expression in the vicinity of the mine.

As part of the baseline sampling program, two test wells were drilled in July of 1976. Surface water quality has been monitored at seven sites on Stanley, Fairway, and Lake creeks since 1986. Five

additional surface water sites are sampled and represent the farthest upgradient expressions of groundwater in drainages around the mine. These sites were chosen to monitor changes in the quality of groundwater discharging to surface drainages. These monitoring wells and sites would continue to be evaluated to determine potential mine water influence on surface and groundwater under the No Action Alternative.

Surface water quality monitoring as described above would continue post-reclamation three times per year until the Agencies agree that monitoring is no longer necessary.

ES.6.1.2 Reclamation

Reclamation materials

Soil salvaged from the west side of the tailings impoundment would be used to provide an average 12-inch cover over the portal patio at the mine and at those areas where buildings and facilities would be removed.

The surface of the tailings impoundment and the embankment would be covered with 18 inches of stockpiled soil and revegetated. The No Action Alternative does not specifically identify the source of these stockpiled soils. The soil needed to complete reclamation would likely come from the soil stockpiled from the construction of the tailings facility.

Subsidence

Subsidence was not addressed as part of the original 1978 reclamation plan. However, during operations, two surface subsidence features developed along the East Fault and a permit revision was issued to address these subsidence issues. Although the Agencies currently hold a bond for reclamation of possible future surface subsidence, it may not be sufficient to cover mitigation for surface subsidence on steep slopes.

Revegetation

The No Action Alternative proposes a mixture of introduced grasses and legumes, native shrubs, and trees to cover all disturbed areas upon reclamation. Soils would be seeded during the first appropriate growing season after necessary surface grading and preparation has been completed. Areas would be fertilized at 200 lb/acre and mulched on south-facing slopes.

Slopes and benches of the tailings embankment would be capped with an average of 18 inches of reclamation material. The tailings impoundment surface would have 18 inches of stockpiled lacustrine and volcanic ash-derived soil materials spread on the surface.

Ponderosa pine, Douglas-fir, western larch, and shrubs would be planted on embankment benches and the tailings impoundment. A grass and legume seed mix would be applied to provide complete vegetative cover. Container-grown tree seedlings would be planted (680 trees/acre density) with container-grown shrubs interspersed among the trees. In 1997 and 1999, 3,750 trees were planted on the northeast face of the slope below the North Adit.

The No Action Alternative calls for stockpile sites to be revegetated and planted with trees and shrubs after the soil has been used for reclamation.

Fertilization and irrigation would depend on reclamation progress. The operational irrigation system includes large irrigation sprinklers and aluminum sprinkler pipe.

Noxious weeds have invaded disturbed sites at the mill site, the tailings line corridor on road cuts and fills, and along the periphery of the tailings facility. There is a current noxious weed control plan approved by Lincoln County and KNF in place. The No Action Alternative would continue the current noxious weed control plan which includes chemical weed control.

Under the No Action Alternative, there is no provision to monitor dust or to minimize the potential for blowing dust through irrigation or revegetation.

Infrastructure

Buildings and all materials would be removed from the project area under the No Action Alternative including removal of the tailings pipelines, the reclaim water line, and the 115 kV transmission line. Disposition of underground equipment is not addressed in the No Action Alternative.

The No Action Alternative would leave the main mine access road (NFSR 4626) open for public recreation access to Spar Lake and Mt. Vernon although the gate would remain at the mill site limiting motorized access. All other roads would be removed and reclaimed, pending approval of KNF.

Topography

Under the No Action Alternative, the surface of the tailings impoundment would be graded and reworked to provide areas suitable for revegetation, but no changes in the configuration of the tailings embankment are proposed.

The benches at the mill site would be left flat or nearly flat. The cut and fill slopes would be regraded and re-established at 1.5 horizontal to 1 vertical (1.5H:1V) slopes. The northeast face of the slope below the North Adit has already been recontoured and revegetated.

At the mine itself, the slopes of the development rock fill patio would remain at their existing angle-of-repose. The surface and edges of the patios would be graded to both distribute surface water runoff and to prevent erosion.

Regrading of the borrow sites once excavations are complete is not addressed in the No Action Alternative.

ES.6.2 Proposed Action

The Revised Reclamation Plan, which is the Proposed Action under this EIS, was submitted to DEQ and KNF in March of 2006. The Proposed Action would reclaim the land to allow current or historic activities to continue or resume once reclamation has been completed.

Under the Proposed Action, the proposed reclamation would be accomplished in three phases: pre-closure, closure, and post-closure. Pre-closure tasks include on-going monitoring, testing, and evaluations necessary to complete design of reclamation elements. Closure tasks would take place two years after final cessation of mining and would include facility removal, regrading, revegetation, and maintenance of short-term components of the water management plan. Adit plugs would be installed during the closure period. Post-closure tasks would include management of mine water flowing through pipelines, maintenance of pipelines, and monitoring of water quality (mine water and surface/groundwater). Under the Proposed Action, the post-closure phase is estimated to last two to five years after mining ends.

ES.6.2.1 Water Management

Adit closure and mine water distribution

The Proposed Action would seal all mine openings against entry by backfilling with mine development rock or with material obtained during regrading of the portal areas. Backfill would be placed from the adit opening back 30 feet into the adits and tight to the roof. Rock remaining after adit plugging would be graded against the side of the slope to form a wedge. Two concrete non-hydraulic plugs would be constructed in the Service and Conveyor adits to funnel water into the collection pipe for conveyance to the decant ponds. No access to this pipe intake would be provided. No concrete plugs are proposed for the remaining adits.

Under the Proposed Action, the two tailings pipelines would be retained to convey water from the mine site to the decant ponds. Once the mine water is of sufficient quality for direct discharge to Stanley Creek, the portions of the tailings pipelines that are buried less than three feet deep would be removed. In the event that the pipeline in use needs repair, water would be diverted through the other pipeline until the first pipeline is repaired or replaced.

Two separate stream channels would be constructed across the mill pad and down the fill slope. Channels would be armored with coarse rock sides to provide stability in 100-year, 24 hour storms. An energy dissipation basin would be created at the toe of the fill slope.

Drainage from the tailings impoundment would continue to the decant ponds and would not be directed to a natural drainage.

Water treatment and disposal

The Proposed Action would route mine pool water through the tailings pipelines to the decant ponds until natural attenuation processes remove nitrogen and copper compounds to an acceptable background quality. The Proposed Action would also continue to use the toe ponds to capture seepage and embankment runoff. After reclamation, snowmelt and runoff from the toe ponds would be pumped to the impoundment to supply irrigation water for the newly-reclaimed surface, if needed, or directly to the decant ponds.

Groundwater quality

The Proposed Action includes continued use of the decant water disposal system to passively and effectively achieve metal attenuation in the mine water. The monitoring plan would include groundwater monitoring to evaluate potential sources of groundwater seepage from the mine as it floods.

Surface water quality

The Proposed Action water quality monitoring plan includes both annual macroinvertebrate monitoring and water quality and flow monitoring three times per year. This water quality monitoring program would continue under the Proposed Action until such time as the Agencies agree that monitoring is no longer necessary. The surface water quality monitoring sites that would be sampled are the same sites as those identified under the No Action Alternative.

The Proposed Action would also retain the toe ponds as permanent features to provide wildlife and wetlands habitat. After operations have ceased, the toe ponds would be connected by inter-pond channels. Although no discharge from the toe ponds is expected, an armored outfall would nonetheless be installed to protect against erosion. No channel to Lake Creek would be constructed.

Storm water runoff would continue to be directed to the decant ponds and the tailings would be contoured to maintain the general flow direction toward the decant ponds.

Long-term monitoring of water quality

The Proposed Action long-term surface and groundwater quality monitoring plan is the same as the No Action Alternative plan.

ES.6.2.2 Reclamation

Reclamation materials

As necessary, all reclamation materials would have chemical fertilizers added to promote successful revegetation. The Proposed Action would not add organic matter to any reclamation materials.

The Proposed Action would leave the stockpiled lacustrine and volcanic ash-derived soil materials west of the toe ponds to provide wildlife and wetlands habitat where they would act as a berm to maintain the toe ponds and to minimize the potential for sediment to reach Lake Creek. Reclamation materials for the tailings impoundment surface would be obtained from the borrow sites which are located east of the impoundment. The tailings facility surface would be covered with an average of 18 inches of growth medium.

The Proposed Action would cover development rock at the portal patios with a 12-inch layer of a finer-grained growth medium from local borrow sources to promote revegetation. However, the Proposed Action does not directly identify potential local borrow source locations.

Under the Proposed Action, the tailings embankment would be inspected annually. This geotechnical monitoring would continue until Troy Mine, Inc. and the Agencies agree to discontinue it.

Subsidence

Subsidence was not addressed as part of the Proposed Action.

Revegetation

Several different plant species mixes would be developed and vegetation types would be applied based on pre-mine occurrence, establishment potential, growth characteristics, soil stabilization qualities, commercial availability, experience from on-site tests, and post-mine land use objectives. Native species would be emphasized and noxious weed-free seed would be used. A wetland mix would be provided for designated areas. Annual ryegrass would be added to forest mixes to provide initial rapid stabilization.

A lower elevation forest mix would be seeded over the majority of the tailings surface, with the addition of some grassland and wetland mix. An upper elevation forest mix would be applied to the portal patios and the mill site office and shop area. Smaller disturbed areas would be planted with a grassland mix and would rely on natural establishment of woody species.

Under the Proposed Action, the borrow sites would be reclaimed after completion of all excavation activities. Impoundment-area borrow sites would be planted with the lower elevation forest species mix and the USFS borrow site would be revegetated with plant species typical of upper elevation forest types.

Fertilizer would be applied except within 200 feet of a perennial stream; mulching would be applied to slopes steeper than 20% with less than 50% coarse fragments. Irrigation may be used during the first season to ensure initial stand development (except for slopes steeper than 10% or upper elevation sites). The operational irrigation system would be used under gravity pressure to irrigate during the first growing season so that pumps would not be needed.

Under the Proposed Action, monitoring of revegetation would occur during the pre-closure and closure phases of mine operation. If poor vegetation growth is noted, additional site remediation would occur.

Similar to the No Action Alternative, the approved noxious weed control plan would continue to be implemented and chemical weed control may continue as needed.

Best Management Practices (BMPs) and irrigation would be used as needed to suppress dust until vegetation is established.

Infrastructure

The Proposed Action would rip asphalt from parking areas and bury it on site with a minimum of three feet of cover material. The buildings would be demolished and materials such as concrete, metal, glass, plastic, and wood would be buried on-site with a minimum of three feet of cover material. Fuel, water, and other tanks would be removed from the site.

Under the Proposed Action, underground equipment would be salvaged if possible. If a salvage market cannot be found, this equipment would be cleaned, all fluids would be removed, and the equipment would be abandoned in place.

The Revised Reclamation Plan states that any existing USFS roads would remain in place per USFS requirements. The Agencies interpret this requirement to mean that no roads are proposed for reclamation under the Proposed Action. The gate would remain in place at the mill site limiting access to non-motorized modes.

The existing storm water collection system would remain in place during the entire building demolition phase, with additional BMPs employed (such as silt fences to control erosion and protect surface water from runoff). The final grading plan would use diversion ditches, culverts, velocity control structures, and riprap in high runoff areas to reduce the potential for sedimentation in Stanley Creek.

All surface pipelines would eventually be removed and salvaged. The two operational 8-inch steel tailings pipelines would be used in succession to pipe mine water to the tailings facility until they wear out or until water quality improves enough to permit discharge into Stanley Creek. Once the pipelines are no longer needed, any sections that are buried less than three feet deep would be removed.

The main power line is the property of Northern Lights Inc. which would have the final decision on removal or preservation of all or portions of the 115-kV power line.

Topography

Slopes of the portal patios would be regraded by pulling the edges up and filling against the cut slope/roadway. Flat areas would be covered with 12 inches of growth medium. The mill site and office and shop areas would be regraded similar to the No Action Alternative except that some demolition debris would be buried on site.

The tailings embankment would be treated in the same manner as under the No Action Alternative. The toe ponds would be connected by inter-pond channels with an armored outfall. Once ore milling has ceased, the tailings impoundment surface is expected to slope to the east in a manner that allows surface water to flow to the eastern edge of the impoundment and into the decant ponds, where it would infiltrate and recharge groundwater. Therefore, no surface regrading would occur under the Proposed Action.

Impoundment-area borrow sites would be graded to reduce slopes to 2H:1V and to establish upper slope diversion ditches. The USFS borrow site would be regraded to blend in with the surrounding topography.

When mine water is no longer routed to the tailings facility, the decant ponds would be regraded to form one shallow depression which would be able to capture runoff from the tailings facility surface and to prevent surface water runoff from leaving the impoundment.

ES.6.3 Agency-Mitigated Alternative

The Agency-Mitigated Alternative is based upon the Proposed Action, but includes additional mitigation measures and monitoring requirements that address major issues identified during the earlier scoping and Interdisciplinary Team (IDT) review process.

ES.6.3.1 Water Management

Adit closure and mine water distribution

The Agency-Mitigated Alternative would plug the South Adit with development rock for approximately 130 feet into the adit (100 feet farther than the Proposed Action). Concrete intake structures would be installed in both the Service and Conveyor adits to capture mine water and to funnel it to the collection pipelines. Closure devices would be installed to prevent unauthorized public access to the Service and Conveyor adits and to allow for periodic cleanout of the intake structures.

A new, buried, mine water pipeline with an automatic leak detection system would replace the two existing 8-inch surface tailings pipelines. The original 10-inch reclaim water line would remain in place for use as an emergency water conveyance line and it also would be retrofitted with a leak detection system. The new pipeline would be buried or double-lined at stream crossings to minimize risk to surface and groundwater systems. In the unlikely event that the pipeline capacity of both lines is exceeded, mine water would flow over the concrete intake structures in the Service and Conveyor adits and would pass through the rock backfill.

A channel would be constructed from the Service and Conveyor adits to the mill site stream channels for emergency overflow from the adits in case the design capacities are ever exceeded. At the mill site and office and shop areas, only one stream channel would be constructed (rather than two under the Proposed Action). The channel would be lined with an impervious liner and rock used in the channel would be sized for the 100-year flow and would not include development rock.

Should mine water be of sufficient quality for direct discharge to surface water without treatment, it would be rerouted to a designed channel to discharge to Stanley Creek. At that time, both the new mine water and the old reclaim pipelines buried less than three feet deep would be removed, and the pipeline corridor and decant pond would be reclaimed.

Water treatment and disposal

Under the Agency-Mitigated Alternative, the ponds would be maintained as deep ponds in order to maintain geochemical functions that facilitate metals attenuation. A berm would be created to prevent storm water runoff from the tailings impoundment surface from draining directly to the decant ponds.

Groundwater quality

The Agency-Mitigated Alternative would be the same as the Proposed Action and continue the seepage pumping activities at the toe ponds until water quality standards are met. Any monitoring wells would be plugged and abandoned per ARM 36.21.810.

Surface water quality

There would be additional monitoring of seeps and springs at the mine during closure to verify whether state water quality standards have been met.

Long-term monitoring of water quality

In addition to the water quality monitoring described for the Proposed Action, the Agency-Mitigated Alternative would include post-closure water quality monitoring for a minimum of five years after mine water discharge actually commences. One additional surface water monitoring site would be added on upper Stanley Creek and four additional monitoring wells in the vicinity of the decant ponds would be added to verify that geochemical conditions in the area of mine water discharge are maintained.

ES.6.3.2 Reclamation

Reclamation materials

The Agency-Mitigated Alternative would use the stockpiled lacustrine and volcanic ash-derived soil materials west of the toe ponds to cover the tailings facility. The lowest portion of the vegetated outer slopes of the stockpile would be maintained to minimize water runoff and to prevent sediment from leaving the majority of the disturbed stockpile surface. A field review of existing reclamation would be conducted to determine if additional soil would need to be spread on the embankment face and benches where soil is thin and revegetation is not adequate.

At the mill site, the Agency-Mitigated Alternative growth medium soil would be the same as in the Proposed Action, but the USFS borrow area material would not be used because of the presence of rush skeletonweed. Both the North and South portal patios would be covered with growth medium from the mine and mill areas.

Growth material would be amended with an agency-approved, wood-based, organic amendment to raise the organic matter content to achieve 1,100 lbs of nitrogen per acre. At the tailings impoundment, this organic amendment would be tilled in to a depth of six inches and at the mine and mill site it would be tilled into the top 12 inches of reclamation material.

Growth medium would be placed on the tailings impoundment in one lift to prevent compaction. All growth media placed for reclamation would be ripped to loosen soil before seeding takes place.

Geotechnical monitoring of the tailings embankment would be conducted by a qualified professional engineer for a minimum of five years after reclamation is completed.

Subsidence

The existing surface subsidence feature that has not achieved a level of stability and utility comparable to the pre-disturbance condition would be reclaimed prior to mine closure. The reclamation bond would be increased to address the possibility of future subsidence on steep terrain. Annual inspections would be conducted to identify new surface subsidence features.

Revegetation

Species mixes would be adjusted to account for site-specific conditions as proposed under the Proposed Action. However, a wetland mix would not be used on the tailings impoundment and trees would be planted there as described in the No Action Alternative. Seed sources for native plant species would be

from northwestern Montana to the extent that these species are commercially available at the time of reclamation. Chemical fertilizers would not be used under the Agency-Mitigated Alternative.

The Agencies would perform a field review of previously reclaimed areas to determine if areas need additional cover materials, revegetation, or reseeded.

Noxious weeds would be controlled in conformance with the approved weed control plan.

Revegetated areas would be monitored until the requirements for bond release are met. Monitoring would also continue until vegetation is sufficiently established to maintain air quality.

Infrastructure

Asphalt from the parking lots and other paved areas would be crushed and used for road gravel on NFSR 4626 or hauled to an approved landfill off NFSL. All demolition materials, whether originating above or below ground, would be disposed of off NFSL in appropriate disposal areas to comply with the Montana Solid Waste Act. Underground equipment would be removed or abandoned in place as under the Proposed Action except that any equipment on NFSL would be removed.

Roads would either be maintained to minimize sediment delivery to surface waters or they would be treated per KNF specifications. Specific road treatments by road segment are described in the Draft EIS.

Water diversion culverts at the mill site would have both ends plugged with concrete, and culverts under roads would be left in place.

Topography

Portal patios would be regraded similar to the Proposed Action, but all growth medium for the mine and mill area would be salvaged from the mill site fill or from the borrow area east of the impoundment. All demolition debris would be disposed of off NFSL in appropriate disposal areas.

All drainage channels would be constructed from imported non-mineralized rock rather than from mine development rock to minimize the potential for metal leaching. Alignment of the larger drainage channel would be down the angle-of-repose mill fill slope. A third channel would be designed from the Service and Conveyor adits to connect with the mill site drainage channels for overflow from the adits if the design capacities are ever exceeded.

A qualified engineer would annually monitor and verify the stability of the embankment for a minimum of five years after reclamation is completed. All eroded or bare areas on the embankment would be repaired by spreading 12 inches of the stockpiled growth medium. The toe ponds would be treated as under the Proposed Action except that non-native fish species may be removed.

Grading of borrow sites and decant ponds would be as described in the Proposed Alternative.

ES.7 Environmental Consequences

The following sections provide a summary of the effects of implementing each alternative. Information is focused on activities and effects where different levels of effects can be distinguished between alternatives. Detailed effects analyses for each alternative are found in Chapter 3 of the Draft EIS.

Reclamation activities were found to have minimal to no effect on several of the resource areas analyzed and there were minimal differences between the potential effects of each alternative. These resource areas include air quality, cultural resources affiliated with tribal groups, traditional cultural properties, historic resources, land use, recreation, socioeconomics, sound, and visual scenery. Many of these same resource areas would experience a net positive benefit from reclamation over the long-term, including air quality, land use, recreation, socioeconomics, sound, and visual scenery. These resource areas are not discussed further in this summary and a more detailed description of potential effects is found in Chapter 3 of the Draft EIS.

Resource areas where there could be potentially substantial impacts under one or more alternatives include fish, geology, hydrology, reclamation materials, transportation, vegetation, and wildlife. The differences in potential effects between alternatives for these resource areas are described in the sections below. Potentially substantial impacts are summarized in Table ES-1.

ES.7.1 Fish

Potential impacts on fish could occur from sediment delivery to creeks and from water quality impacts.

The No Action Alternative and the Agency-Mitigated Alternative would temporarily increase sediment delivery to Stanley, Ross, and Lake creeks during reclamation activities but would reduce sediment loads and improve fish habitat over the long-term through road treatment. Sediment increases in Ross and Lake creeks would be small relative to existing sediment loads and would not result in measurable effects to cutthroat or bull trout habitat or populations. The Agency-Mitigated Alternative would introduce the smallest amount of sediment to stream channels due to design features and mitigation measures such as timing restrictions within Riparian Habitat Conservation Area (RHCA).

The Proposed Action would deliver the greatest amount of sediment to streams because roads would not receive treatment under this alternative. Any additional sediment from these sources would add to the already elevated sediment load that currently exists in Stanley Creek and would adversely impact water quality for an extended period of time. Some of this sediment would also be expected to reach Lake Creek, which is listed as impaired for sediment.

The No Action Alternative would discharge mine water directly to Stanley Creek that could exceed current surface water quality standards and could potentially impact macroinvertebrate, tailed frog, and brook trout abundance. Both the Proposed Action and the Agency-Mitigated Alternative would route mine water discharge to the decant ponds where natural attenuation mechanisms would provide long-term water quality treatment. The Proposed Action would use the existing tailings pipelines which are 30 years old. These pipelines have the potential to break allowing a large volume of adit water and sediment to reach Stanley Creek and/or Lake Creek until the pipeline could be shut off and repaired.

The Agency-Mitigated Alternative would mitigate this potential effect by constructing a new pipeline with an automatic leak detection system and would retain the existing buried line as a backup system. The Agency-Mitigated Alternative would include long-term maintenance of the water treatment/management system and monitoring of seeps and springs to detect potential water quality issues in a timely manner. The Agency-Mitigated Alternative would avoid potential surface water impacts by using only rock with little or no potential for near-neutral metal leaching in reconstructed stream channels.

ES.7.2 Geology

Geology effects include consideration of how the geochemical composition of the geologic materials would affect revegetation success, mitigation for potential subsidence events, and effects of reclamation on topography.

In all three reclamation alternatives, the geology and geochemical composition would have minimal impact on revegetation success. There are some differences between alternatives in the selection of materials for reclamation in different parts of the project area. Under the Agency-Mitigated Alternative, no additional measures would be required to mitigate geochemical impacts to reclamation success. The use of the rocky glacial and the lacustrine and volcanic ash-derived soils as growth media would minimize root contact with mined materials. This would effectively minimize the potential effects of plant uptake of metals from the development rock and tailings.

After mine closure, another subsidence event could occur regardless of the alternative selected. However, only the Agency-Mitigated Alternative includes an adequate range of practicable mitigation measures to address potential subsidence events.

Similarly, all three alternatives would provide a net positive effect to local topography through increased soil stability, erosion resistance, and storm water control. Regrading would not return the mine area or the tailings impoundment area to pre-mine conditions, but revegetation would soften the man-made appearance. The portal patio slopes would resemble talus slopes, and the tailings impoundment would resemble a terrace above Lake Creek. The Agency-Mitigated Alternative would use the most appropriate technology currently available including engineering and reclamation practices that have been proven effective to stabilize soils, minimize erosion, and to limit infiltration into mined materials containing metals.

ES.7.3 Hydrology

The No Action Alternative would not comply with the Federal Clean Water Act, Montana Water Quality Act, USFS policy, or with the Kootenai National Forest Plan because untreated mine water that would exceed water quality standards would be discharged to surface water. Moreover, moderate to high sediment delivery is likely from the mill site, mine portals, and from the tailings impoundment following the proposed reclamation.

In contrast, mine water disposal under either the Proposed Action or the Agency-Mitigated Alternative would reduce potential water quality impacts to Stanley Creek and to upper Lake Creek. Under both the

Proposed Action and the Agency-Mitigated Alternative, the mine discharge would be routed to the decant ponds for treatment. At the decant ponds, the water would infiltrate and be treated by natural attenuation mechanisms along the groundwater flow path to reduce concentrations of constituents of concern to levels that would meet water quality standards. There is a greater risk of short-term water quality violations under the Proposed Action because of the higher risk of accidental discharge of mine water from failure of the tailings pipeline to Stanley or Lake creeks. The likelihood of surface water quality impacts would be further reduced under the Agency-Mitigated Alternative by installing a new buried mine water pipeline with a leak detection and backup system for mine water transport.

Stanley and Lake creeks have been listed on the TMDL 303d list as impaired streams. Probable causes of impairment of Stanley Creek are copper and nutrients. Probable causes of impairment of Lake Creek are nutrients, sediment, and physical substrate habitat alterations. Because nitrate concentrations would decrease after blasting ceases, closure and reclamation of the mine would reduce nutrient loading to surface water under all alternatives. After mine closure, there would be reduced risk of spills of mine tailings into surface water under all alternatives. The No Action Alternative would result in increased copper loading from mine water discharge to Stanley Creek and would not accomplish the goals of the TMDL program. Both the Proposed Action and the Agency-Mitigated Alternative would reduce the potential for loading of copper to Stanley Creek.

Reclamation of mine roads on NFSL under the No Action and Agency-Mitigated alternatives would reduce sedimentation and siltation in Lake Creek over the long-term. The Proposed Action would not reduce sedimentation and siltation in Lake Creek over the long-term because it would not treat unneeded roads. Under the Proposed Action, sediment would also originate from stream erosion across the mill site. Any additional sediment from untreated roads and stream erosion across the mill site would add to the already elevated sediment load that currently exists in Stanley Creek and would adversely impact beneficial uses for an extended period of time. Some of this sediment would also be expected to reach Lake Creek, which is listed as impaired for sediment.

ES.7.4 Reclamation Materials

All three alternatives would provide reclamation of disturbed sites. The growth medium replacement plans for the tailings impoundment under the No Action and Agency-Mitigated alternatives would produce the best long-term results in terms of soil quality and plant productivity. The necessary volume of soil already exists in the soil stockpiles, and the glacial outwash borrow materials would not be needed under either of these alternatives. No additional disturbance would occur in the glacial outwash borrow areas under these two alternatives. The Agency-Mitigated Alternative would use BMPs not included in the No Action Alternative to minimize potential impacts of erosion to Lake Creek and to the toe ponds that could possibly result from use of stockpiled materials. Under the No Action Alternative there may still be issues with erosion of fine-grained soils that would not be stable on slopes over eight percent in the mine and mill area.

The No Action Alternative and the Proposed Action would use chemical fertilizers as needed to improve productivity. The Agency-Mitigated Alternative would use organic, wood-based amendments to improve the nitrogen content of the growth media. The Agency-Mitigated Alternative would also

require appropriate soil testing to identify other amendments, such as organic fertilizer, that may be needed to increase soil quality and revegetation success.

The MMRA requires the reclamation of all disturbed lands to comparable stability and utility as that of adjacent lands. The No Action and Agency-Mitigated alternatives would reclaim all mining lands to comparable stability and utility; however, the Agency-Mitigated Alternative would achieve these goals more effectively and would use the soil materials that were stockpiled prior to construction of the tailings impoundment. The Proposed Action would not produce comparable utility on the reclaimed tailings impoundment.

ES.7.5 Transportation

Under all three alternatives there would be a substantial reduction in traffic after reclamation activities are completed. This reduction in traffic would reduce road maintenance costs on local road networks.

The Proposed Action maintains the existing road system and related road maintenance costs. The No Action and Agency-Mitigated alternatives implement BMPs on 19.2 miles of road needed for long-term access (includes stabilization for intermittent stored service) and decommission 6.5 miles of unneeded road, thereby reducing long-term road maintenance costs as compared to the Proposed Action. The Agency-Mitigated Alternative further reduces long-term road maintenance costs by replacing the 6 miles of paved surface on NFSR 4626 with gravel.

ES.7.6 Vegetation

There would be little new disturbance from implementing any of the reclamation alternatives. In general, all three alternatives would revegetate areas that have been disturbed for over 30 years. Disturbed lands would be covered with a growth medium to promote vegetation and would be reseeded or planted, thereby returning the land to a more natural, mostly vegetated state. Under all three alternatives, most of the site would eventually become reforested, but the diverse native plant communities that were originally present would never fully re-establish. The loss of many native species would limit wildlife habitat on public and private lands for some species, and it would take several decades for a forest-dominated habitat to develop on reclaimed lands.

Potential issues and differences between alternatives with respect to vegetation include the seed and plant mixes proposed, the use of soil amendments to promote plant growth, the use of various borrow materials that have differing amounts of noxious weed seed, and the treatment of invasive, noxious weeds.

The No Action Alternative proposes one seed and plant mix that would be used on all disturbed sites regardless of elevation. This mix includes non-native grasses and legumes and because the No Action Alternative includes planting of non-native species, it would not comply with the Forest Service Northern Region Native Plant Policy. The No Action Alternative would not meet current standards for public lands, and thus would be considered not feasible as far as revegetation is concerned.

The Proposed Action includes five different seed/planting mixtures of native grasses, legumes, shrubs, and trees proposed for site-specific use on the basis of pre-mine species occurrence, establishment potential, growth characteristics, borrow stabilization qualities, commercial availability, experience gained from previously completed reclamation activities, and post-mine land use objectives. Seed and plant mixes would be used with consideration for differences in plant communities based on elevation. Under the Agency-Mitigated Alternative, these seed and plant mixes would be required to use seed sources native to northwestern Montana.

Both the No Action Alternative and the Proposed Action would use chemical fertilizers to promote plant growth. The Agency-Mitigated Alternative adds an agency-approved, wood-based, organic amendment in the top six inches of reclamation materials at the tailings impoundment, and in the top 12 inches of reclamation materials at the mine portals, and mill site. Approximately 1,100 lbs/acre of organic nitrogen would be added to the growth medium in this fashion.

Use of the USFS borrow source (which contains rush skeletonweed, a new invader weed species) under both the No Action Alternative and the Proposed Action would not comply with the KNF noxious weed MOU with Lincoln County. The No Action Alternative would use the lacustrine and volcanic ash-derived soil materials from near the tailings impoundment to reclaim the mine and mill areas. However, another new invader species, meadow knapweed, is found in those materials. Use of these reclamation materials on NFSL under the No Action Alternative would not comply with the KNF noxious weed MOU with Lincoln County.

The Agency-Mitigated Alternative would better comply with the regulatory framework because it would not use the USFS borrow area containing rush skeletonweed and would limit the use of lacustrine and volcanic ash-derived soil material containing meadow knapweed to private lands.

ES.7.7 Wildlife

There are no differences between the three alternatives and no substantial impacts for the following wildlife species:

- Threatened or Endangered Species: Canada lynx, gray wolf
- Sensitive Species: bald eagle, black-backed woodpecker, Coeur d'Alene salamander, common loon, fisher, flammulated owl, harlequin duck, peregrine falcon, Townsend's big-eared bat, wolverine
- Management Indicator Species: elk, mountain goat, pileated woodpecker
- Migratory birds

There are substantial differences between the alternatives with respect to grizzly bear and western toad.

The No Action and Agency-Mitigated Alternatives would reclaim most roads, which would improve habitat conditions for grizzly bear. The Agency-Mitigated Alternative includes seasonal restrictions on road reclamation work that could further minimize effects on grizzly bear. The Proposed Action does

not include road reclamation, although because it would not build or open roads to motorized traffic it would maintain current road densities.

The No Action Alternative includes sweet clover (*Melilotus* spp.) in the seed mix which could create human-grizzly conflicts in areas where it is planted because it attracts grizzly bears. The No Action Alternative, if approved today, would not be in compliance with ESA because it creates human grizzly conflicts. Both the Proposed Action and the Agency-Mitigated Alternative would use native seed mixes for revegetation and neither alternative would use sweet clover.

The No Action Alternative and Proposed Action could adversely affect western toad individuals and breeding/metamorphosis habitat in the toe ponds at the tailings impoundment area during reclamation material excavation and by alterations to the toe ponds. Agency-Mitigated Alternative includes a variety of mitigation measures to avoid and minimize these potential impacts.

Table ES-1. Potentially Substantial Effects by Alternative

	No Action Alternative	Proposed Action	Agency-Mitigated Alternative
Fish	Alternative would result in potential water quality impacts from mine water discharge to Stanley Creek. Road reclamation would minimize potential sediment delivery to streams over the long-term.	Sediment delivery quantities to streams would continue because road reclamation would not occur; potential water quality and erosion impacts from potential breakage of tailings pipelines carrying mine water discharges.	Additional mitigation measures and monitoring would minimize potential for water quality violations (see ES.6.1 and ES.6.3). Road reclamation would minimize sediment delivery to streams over the long-term.
Geology	Alternative does not address subsidence.	Subsidence measures would not be adequate.	Subsidence effects would be mitigated.
Hydrology	Untreated mine water would be discharged to surface water and would violate water quality standards.	Alternative poses a high risk of short-term water quality violations because of the higher risk of accidental discharge of mine water from the tailings pipeline to Stanley or Lake creeks.	Additional mitigation measures and monitoring would minimize potential for water quality violations (see ES.6.3).

	No Action Alternative	Proposed Action	Agency-Mitigated Alternative
Reclamation Materials	Use of fine-grained soils that would not be stable on slopes over eight percent in the mine and mill area would result in erosion.	Alternative would not result in comparable utility on the reclaimed tailings impoundment.	Alternative would use the soil materials that were stockpiled prior to construction of the tailings impoundment and would include use of organic, wood-based amendments. Materials would be applied appropriately depending on slope and grain size (e.g. fine-grained materials on flatter areas, coarser grained materials on steeper slopes.)
Transportation	Alternative would reclaim and stabilize roads.	Alternative maintains the existing road system and related road maintenance costs.	Alternative would reclaim and stabilize roads. Road maintenance costs on NFSR 4626 would be further reduced compared to other alternatives.
Vegetation	Plant species mix proposed includes non-native species including sweet clover. Alternative would use the USFS borrow source which contains rush skeletonweed. The lacustrine and volcanic ash-derived soil materials from near the tailings impoundment would be used to reclaim the mine and mill areas, spreading meadow knapweed to these areas. Alternative would not comply with noxious weed and native species policies.	Alternative would use the USFS borrow source (which contains rush skeletonweed) and would not comply with noxious weed and native species policies.	The spread of noxious weeds would be minimized by restricting the use of the USFS borrow site and limiting use of lacustrine and volcanic ash-derived soils to the tailings impoundment area. Seed sources for native plant species would be from northwestern MT, if available at the time of reclamation. Alternative would comply with noxious weed and native species policies.

	No Action Alternative	Proposed Action	Agency-Mitigated Alternative
Wildlife	<p>Alternative includes sweet clover in the seed mix which could create human-grizzly conflicts in areas where it is planted. The No Action Alternative, if approved today, would not be in compliance with ESA.</p> <p>Western toad habitat would be potentially affected by reclamation material excavation and alterations to the toe ponds.</p>	<p>Alternative would not reclaim roads and so would not result in an improvement in grizzly habitat parameters.</p> <p>Western toad habitat would be potentially affected by reclamation material excavation and alterations to the toe ponds.</p>	<p>Potential impacts to grizzly bear would be mitigated by requiring native plant in the revegetation mixes and road reclamation.</p> <p>Western toad habitat effects would be minimized through appropriate BMPs.</p>