

1. INTRODUCTION

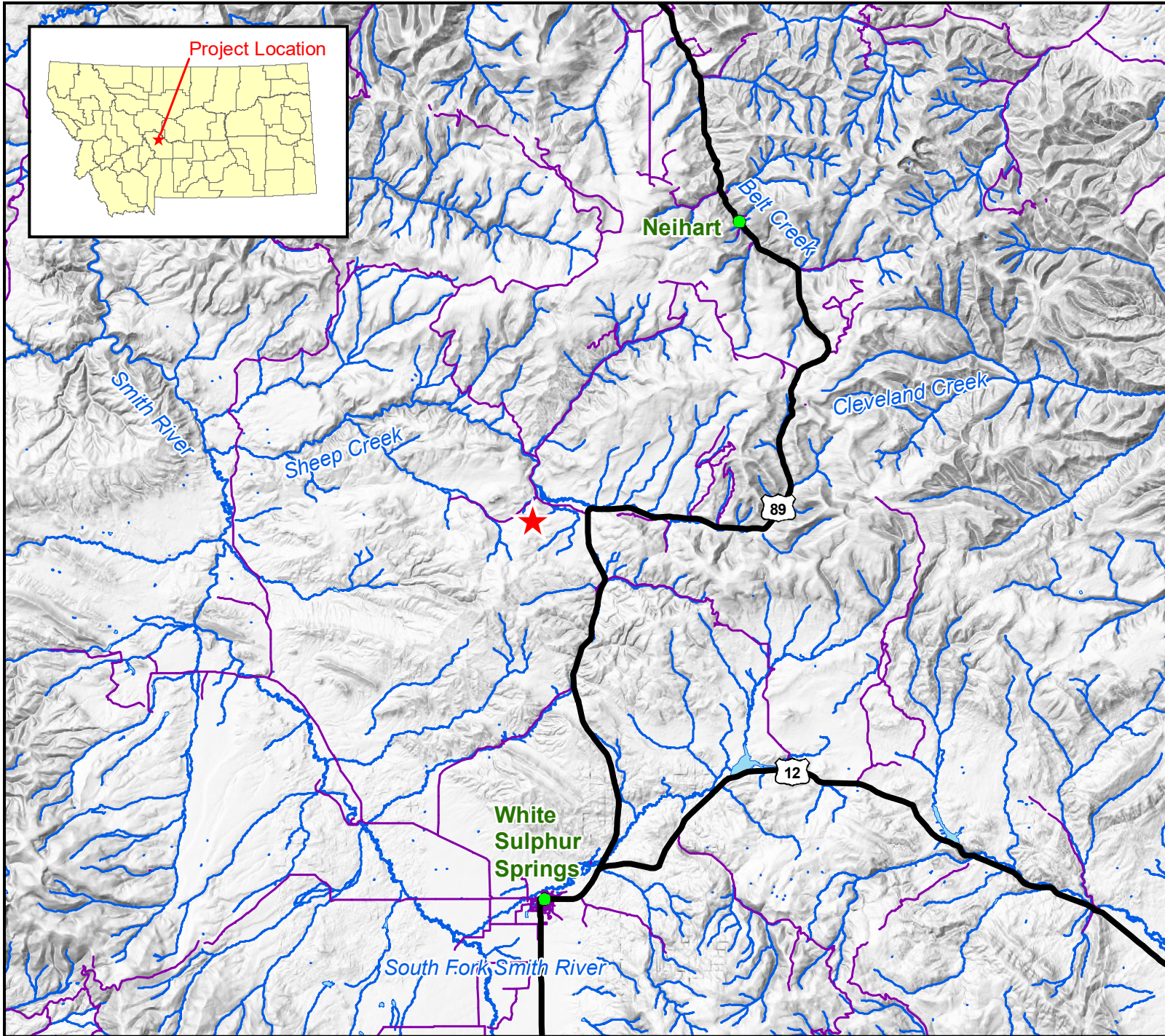
This Executive Summary provides an overview of the contents of the Environmental Impact Statement (EIS) for the proposed Black Butte Copper Project (the Project). The Department of Environmental Quality (DEQ) has prepared the Draft EIS prior to taking state action on applications for permits or other state authorizations submitted by Tintina Montana, Inc. (the Proponent). The Draft EIS describes the area, people, and resources potentially affected by the proposed mining activities.

This Executive Summary does not provide all details contained in the Draft EIS. Please refer to the Draft EIS, its appendices, or referenced reports for more information. The Draft EIS presents the purpose and need for the proposed Project (Chapter 1); descriptions of the No Action Alternative, Proposed Action, and Agency Modified Alternative (AMA) (Chapter 2); descriptions of the affected environment and environmental consequences for all potentially affected resources (Chapter 3); an analysis of potential cumulative impacts for various resources (Chapter 4); a comparison of the Project alternatives (Chapter 5); and a list of the consultation and coordination efforts undertaken as part of the EIS development (Chapter 6).

2. PROJECT BACKGROUND

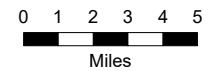
The Project is located approximately 15 miles north of White Sulphur Springs in Meagher County, Montana (see **Figure ES-1**). The Project area consists of 1,888 acres of privately owned ranch land under lease to the Proponent, with associated buildings and a road network throughout. The Proponent intends to construct, operate, and reclaim a new underground copper mine over 19 years, and thereafter monitor and close the site. Surface disturbances to private land would total approximately 311 acres.

The Proponent acquired mineral rights lease agreements to mine the property via underground mining in May 2010 and has conducted surface exploration activities under Exploration License No. 00710 since September 2010. The Proponent submitted an application to amend their exploration license on November 7, 2012, in order to construct an exploration decline into the upper Johnny Lee zone. DEQ conducted an environmental review related to that exploration license amendment application, issuing a Final Mitigated Environmental Assessment in January 2014. DEQ selected the Agency Mitigated Alternative during this review. However, the Proponent subsequently chose not to construct the exploration decline and withdrew the proposed exploration project. The Proponent submitted a Mine Operating Permit (MOP) Application and revisions to DEQ on December 15, 2015; May 8, 2017; and July 14, 2017.



**Figure ES-1
Black Butte
Copper Project**
Project Location
Meagher County,
Montana

- ★ Project Location
- City
- U.S. Route
- Local Road
- Stream
- Lake



3. PURPOSE AND NEED

The Montana Environmental Policy Act (MEPA) and its implementing rules require that EISs prepared by state agencies include a description of the purpose and benefits of the proposed project. The purpose of the Project is to mine the Johnny Lee Deposit by underground mining methods, process the copper-enriched rock on site into a salable copper concentrate, and ship the concentrate for sale. Benefits of the Project include the production of copper to help meet public demand, and increased employment and tax payments in the Project area (see Section 3.9, Socioeconomics, of the EIS).

The Project purpose and need for DEQ is described in Section 1.2.1 of the EIS. The Project purpose and need for the Proponent is described in Section 1.2.2 of the EIS.

4. PUBLIC PARTICIPATION

On August 15, 2017, DEQ issued a press release stating that the MOP Application was complete and the environmental review was set to begin (DEQ 2017a). DEQ issued a second release on September 18, 2017, indicating the review had begun under MEPA (DEQ 2017b).

DEQ established a public comment scoping period from October 2 to November 16, 2017 (i.e., 46 calendar days). During this time, DEQ held four public meetings in Montana (DEQ 2017c and 2017d):

1. October 30 at the Civic Center in Great Falls;
2. November 1 at the White Sulphur Springs High School gymnasium in White Sulphur Springs;
3. November 6 at the Radisson Hotel in Helena; and
4. November 7 at the Park County High School Gymnasium in Livingston.

During this public scoping process, written and oral comments were submitted via email, by mail, or at public meetings. DEQ prepared a Scoping Report that includes a summary of all comments received, organized by issue (Appendix J).

5. ALTERNATIVES

Alternatives fully evaluated in the Draft EIS include the No Action Alternative, Proposed Action, and Agency Modified Alternative. Several additional alternatives were evaluated but eliminated from further consideration due to several factors; see Section 2.4 of the EIS for more information.

5.1. NO ACTION ALTERNATIVE

Under the No Action Alternative to the Project, there would be no mine as proposed. DEQ would not approve the Proponent's application for (1) an Operating Permit under the Metal Mines Reclamation Act, (2) a Montana Pollutant Discharge Elimination System Permit, or (3) an Air Quality Permit. The No Action Alternative recognizes that the Proponent could continue surface exploration activities at the Project site under its existing Exploration License No. 00710.

5.2. PROPOSED ACTION

The Proposed Action would allow the Proponent to mine the Johnny Lee Deposit by underground mining methods. The Proposed Action would have a mine life of 19 years, including 2 years for construction, 13 years for active mining, and 4 years for reclamation and closure. The Project's major components would include a portal and underground mine workings and utilities, as well as a processing plant that includes a crusher, grinding mills, a flotation circuit, tailings thickener, a paste tailings plant, a Water Treatment Plant (WTP), concentrate storage facility, parking, and two laydown areas. Other surface facilities would include a Process Water Pond (PWP), Contact Water Pond (CWP), Non-Contact Water Reservoir (NCWR), Treated Water Storage Pond (TWSP), wet well and pipeline, buried drainpipes, roads, a waste rock stockpile, an ore stockpile, three overburden stockpiles, power line, ditches, and fencing.

The proposed operation would mine approximately 15.3 million tons of material, including 14.5 million tons of copper-enriched rock (with an average grade of 3.04 percent copper) and 0.8 million tons of waste rock. The Proposed Action would utilize the drift-and-fill mining method to access the rock. This method allows the entire deposit to be mined while incrementally backfilling the mined-out voids¹ with fine-grained cemented tailings paste. All copper-enriched rock mined would be hauled by articulated underground haul trucks either to the surface crusher or to the ore stockpile.

Crushed copper-enriched rock would travel to a surge bin through a series of three grinding mills (a semi-autogenous grinding mill, ball mill, and tower mill) in the processing plant that would progressively reduce the size of the rock. The finely crushed copper-enriched rock would then enter a flotation circuit where copper would be separated from non-copper bearing rock through chemical and physical processes. The flotation circuit also would include a concentrate re-grind mill. The resulting copper concentrate would then be thickened and pressed to remove water and shipped in sealed containers via truck off site. About 440 tons of copper-rich concentrate would be produced daily and transported in closed shipping containers by, on average, 18 trucks per day. The closed shipping containers would minimize or avoid potential leakage or spillage during transport.

The road system that would be used to transport mine concentrates between the Project site and the Livingston and Townsend railheads includes portions of Sheep Creek Road, U.S. Route 89, U.S. Route 12, I-90, and local roads in Livingston and Townsend. Rail facilities used to haul mine concentrates include Montana Rail Link rail yards at Livingston and Townsend, Montana,

¹ A "void" is the space from which the ore was removed.

Rail Link mainline tracks serving these railheads, and Burlington Northern Santa Fe Railroad mainline tracks in Montana.

Approximately 12.9 million tons of tailings would be produced over the life of the Project. The tailings would be thickened and sent to a paste plant where cement, slag, and/or fly ash could be added to the tailings as a binder. The product, called cemented paste tailings, would be piped either to the underground mine to backfill workings or to a double-lined tailings basin called the Cemented Tailings Facility (CTF). Approximately 55 percent of the cemented tailings paste produced by the Project would be stored in the CTF, with the remaining 45 percent used to backfill production workings during the sequential mining of drifts.

The Proponent would employ approximately 240 workers, with an additional 24 contract miners and 130 associated support workers at the site during the first 4 years of mining. Construction of mine facility and surface support structures during the initial 30 to 36 months would require a maximum of approximately 173 sub-contracted employees.

Closure and reclamation would focus on removal of surface infrastructure and exposed liner systems, and covering exposed tailings. No waste rock would be left on the surface in closure. Reclamation plans include removal of all buildings and their foundations and surface facilities including the portal pad, copper-enriched rock stockpile pad, PWP, CWP, plant site, TWSP, and NCWR. The reclamation plan also requires re-contouring the landscape, subsoil and soil replacement, and revegetating all the sites with an approved seed mix.

Mine closure would include the backfilling of some primary and secondary access drifts with fine-grained, low permeability, cemented paste tailings. The decline and access ramps would not be backfilled.

Mine workings would be sequentially flooded at closure with groundwater. Prior to flooding a particular portion of the mine, the walls of the workings within that zone would be rinsed to remove oxidation products. Rinse water would be collected, pumped, and treated as necessary. The zone would then be flooded with groundwater and a hydraulic barrier would be installed. In all, 14 hydraulic barriers—both plugs and walls, which are masses of concrete—would be installed in the underground workings. Five of the hydraulic barriers would be installed at the main access ramps, eight in the four ventilation raises (an upper and lower barrier in each raise), and one plug at the mine portal. The primary purpose of the hydraulic barriers is to segment the mine workings based upon sulfide content to facilitate rinsing and improve water management.

Closure objectives would be expected to be attained by water treatment within 1 year after mining and milling is completed, and once initial facility closure activities have been sufficiently implemented. Monitoring would continue after closure to ensure no unforeseen impacts were occurring. Monitoring would continue until DEQ determines that the frequency and number of sampling sites for each resource can be reduced or that the closure objectives have been met and monitoring can be eliminated.

5.3. AGENCY MODIFIED ALTERNATIVE: ADDITIONAL BACKFILL OF MINE WORKINGS

The AMA includes all elements from the Proposed Action with one replacement component: backfilling additional mine workings, including the final stopes and portions of the decline, access ramps, and ventilation shafts that are located within sulfide zones.

The AMA proposes to backfill certain voids (i.e., access openings) with a low hydraulic conductivity material consisting of cemented paste tailings generated from mill processing of the stockpiled ore and/or waste rock at the end of operations. Cemented paste tailings would only be used to backfill certain mineralized mine voids to avoid the potential of degrading groundwater quality in non-mineralized geologic units (DEQ 2018). The upper section of the access decline (within the Ynl A geologic unit) and a lower section of the access tunnel (within the Ynl B geologic unit) would not be backfilled because these units have better baseline groundwater quality and are more permeable than deeper geologic units. All mine voids located within the Upper Sulfide Zone and the Lower Sulfide Zone would be backfilled with cemented paste tailings. Hydraulic plugs would be used to separate the backfilled and open areas of the access decline.

Approximately 106,971 cubic yards of cemented tailings would be needed to backfill the access tunnels and ventilation raises (Tintina 2018). The backfill material would be mixed with cement in a manner that achieves a similar low hydraulic conductivity as is proposed for backfilling of the mined stope areas. Since this volume of stockpiled ore source would exceed the proposed volume of the Copper-Enriched Rock Stockpile, this Project modification would also need to utilize the temporary WRS pad until the end of operations and backfilling of interior mine surfaces.

6. ENVIRONMENTAL CONSEQUENCES

The following discussion provides a summary of the impacts of implementing each alternative on each resource area. Proposed mining activities were found to have minimal-to-no impact on air quality, cultural resources, noise, and vegetation. These resource areas are not discussed further in this summary. Detailed impacts analyses for each alternative and topic area are found in Chapter 3 of this EIS. **Table ES-1** summarizes and compares the impacts of the three alternatives considered in detail.

6.1. GROUNDWATER HYDROLOGY

Under the Proposed Action, mine dewatering would substantially lower groundwater levels around the mine, somewhat reducing base flow in nearby creeks and impacting some springs and seeps within the area where groundwater levels are lowered. Operation of an alluvial Underground Infiltration Gallery (UIG) would increase groundwater discharge, partially compensating for the decreased base flow caused by mine-dewatering. The NCWR would recharge groundwater beneath this pond, partially compensating for the mine-dewatering caused

decrease in base flow. Contact groundwater in post-mine voids would migrate via shallow bedrock toward discharge zones mixing with non-contact groundwater. Transport of chemicals dissolved in contact groundwater would be retarded by the process of adsorption, and groundwater discharging to Sheep Creek would not affect its water quality.

Impacts to groundwater quantity and quality would be similar under the AMA. Complete backfill of the Upper and Lower Sulfide Zones with cemented paste tailings would return hydraulic parameters within these bedrock zones to conditions similar to the pre-mining state, eliminating the potential for development of new groundwater flow paths through these areas.

6.2. SURFACE WATER HYDROLOGY

Under the Proposed Action, less than 1 percent of the Sheep Creek watershed area would be affected, resulting in a negligible impact on surface water runoff or flows in Sheep Creek. Coon Creek would be affected by an estimated 70 percent reduction in steady state base flow due to mine dewatering intercepting groundwater that might otherwise have discharged into Coon Creek. To mitigate the reduction, water from the NCWR would be pumped into the headwaters of Coon Creek to augment flows within 15 percent of the average monthly flow. Process water discharged to surface waters via UIGs would be treated and would not impact water quality in Sheep Creek. Therefore, no adverse impacts related to water quality are anticipated.

Impacts on surface water quantity and quality would be similar under the AMA.

6.3. LAND USE AND RECREATION

Under the Proposed Action, there would be approximately 311 acres of direct land use impacts due to surface disturbances from the Project, which would be reclaimed after 19 years of mine life. There would be no direct impacts on recreation, hunting, or fishing in the proposed disturbance footprint as this area consists of private ranch lands.

Impacts on land use and recreation would be similar under the AMA.

6.4. VISUALS AND AESTHETICS

Under the Proposed Action, impacts to visual resources during construction (caused by removal of existing vegetation, temporary fencing, grading, construction of roads and mine structures, and increased construction vehicle traffic) would be short term, medium frequency, local in scope, and partially reversible. Impacts to visual resources would be similar during operations, but would persist for a longer time period. Impacts to visual resources after closure and reclamation would be long term, medium frequency, and local in scope.

Impacts on visuals and aesthetics would be similar under the AMA.

6.5. SOCIOECONOMICS

Under the Proposed Action, Project construction would require an estimated workforce of 70 to 115 contractors during a given year. Once operational, the Project would require an estimated workforce of 386 individuals (i.e., 235 employees, 24 contractors, and 127 associated support

workers). During reclamation, the estimated workforce would range from 337 people to 86 people. Meagher County and particularly the city of White Sulphur Springs are expected to experience the greatest population growth. Housing impacts could come in the form of increased demand and costs for housing due to population influx.

Potential adverse impacts to public infrastructure are expected, including a demand for services that exceeds the available capacity or degradation that exceeds the county or city's ability to perform repairs. The Project has the potential to impact local healthcare capacity as a result of associated population influx.

A potential positive impact is expected from employment and income effects. In addition, government units would benefit from the additional tax revenues generated by the mine. The White Sulphur Springs School District #8 would receive all of the added mineral development taxable value, projected to be \$8,235,000 at peak copper production. The City of White Sulphur Springs would receive 20 percent of the new taxable valuation to assess its mill levies against, and Meagher County would be able to levy 100 percent of its mills for all funds except those that are not levied within the city limits of White Sulphur Springs.

Impacts on socioeconomics would be similar under the AMA.

6.6. SOILS

Under the Proposed Action, approximately 563,692 cubic yards of soil would be salvaged and stockpiled long-term for reclamation activities associated with mine closure, and approximately 304,773 cubic yards would be temporarily stored and replaced on site for reclamation of construction activities, including grading, slope stabilization, drainage control, topsoil and subsoil placement, and seeding. There would be short-term soil compaction and biological impacts within the salvaged soils. The loss of soil development and the time required to rebuild a new soil profile would be unavoidable long-term Project impacts given the long-term storage of soil.

Impacts on soils would be similar under the AMA.

6.7. TRANSPORTATION

Under the Proposed Action, Project construction would generate an average of 160 daily vehicle movements (i.e., one trip to or from the Project site), along with 8 supply truck round trips per day. Project operations would generate up to 477 employee vehicle movements per day, 36 concentrate haul truck movements per day, and 12 other truck movements per day. Traffic generated by Project construction and operations would not meaningfully impact traffic capacity on analysis area roads. As a result, traffic congestion is a low-likelihood event during both construction and operations. Project traffic could increase the chance of traffic incidents, degradation of roadways, and other risks to road safety, but Proponent-recommended road and intersection improvements would minimize impacts on road safety. Impacts on transportation during reclamation would be similar to those anticipated for construction.

Under the AMA, additional backfilling would marginally increase truck traffic compared to the

Proposed Action over a 4-year period. However, these additional trips would not meaningfully change the traffic impacts described for the Proposed Action.

6.8. WETLANDS

Under the Proposed Action, there would be approximately 0.85 acre of permanent direct impacts to wetlands due to the construction of access/service roads, the CTF, and the wet well for the Sheep Creek water diversion. Impacts to jurisdictional wetlands would require both a U.S. Army Corps of Engineers 404 and DEQ 401 Water Quality Certification permit prior to Project initiation. The Proponent submitted permit applications for both and received authorization in January 2017. To compensate for the 0.9 acre of direct wetland impacts and functional assessment areas, the Proponent would be required to purchase 1.3 acres of wetland mitigation credits from an approved wetland mitigation bank or In-Lieu Fee program. No secondary impacts are expected due to wetland fragmentation, hydrology changes, or water quality changes.

Impacts on wetlands would be similar under the AMA.

6.9. WILDLIFE

Under the Proposed Action, approximately 311 acres of wildlife habitat would be removed, to be reclaimed to similar habitat types after mine closure (i.e., 19 years); however, forest habitats would not reach the same functionality as existing conditions for decades. There would be a low likelihood of direct mortality (e.g., wildlife-vehicle collisions) for threatened and endangered species, and a medium likelihood for some big game species; however, no population-level impacts are anticipated for any species. Wildlife species could be disrupted by construction and operational noise within 1 to 2 miles of the Project. No adverse impacts related to water quantity or quality are anticipated.

Impacts on wildlife would be similar under the AMA.

6.10. AQUATIC BIOLOGY

Under the Proposed Action, aquatic biota may be affected by stream crossings and sedimentation, thermal changes, and the NCWR wet well intake pipeline. The two crossings combined would affect 0.1 acre of riparian wetlands, 85 feet of Little Sheep Creek, and 69 feet of the Brush Creek tributary to Little Sheep Creek. If stream flow were to be augmented via direct discharge from the NCWR, the temperature would be monitored, and discharges limited as necessary, in order to prevent impacts to aquatic life. Aquatic biota (i.e., macroinvertebrates) in the natural channel of Coon Creek may be impacted by changes in hydrology and sedimentation from construction activities. Aquatic biota could be impacted by the installation of the NCWR wet well intake, and potential impacts could include: entrainment and impingement of fishes and invertebrates; alteration of natural flow rates when water is pumped, which would only be done when the flow in Sheep Creek exceeds 84 cubic feet per second; degradation of shoreline and riparian habitats; and alteration of aquatic community structure and diversity.

Impacts on aquatic biology would be similar under the AMA.

**Table ES-1
Comparison of Project Impacts by Alternative**

Resource Area / Impact ^a	No Action Alternative	Proposed Action	Agency Modified Alternative
Air Quality			
Ambient Air Quality Standards	No change from current condition.	Predicted impacts for criteria pollutants at all offsite locations comply with health-based Montana and federal primary standards, which are protective of ambient air quality.	Same as Proposed Action. Emissions from extended production of cemented tailings to backfill more of the mined areas are a small fraction of emissions from the Proposed Action, and likely to have little impact on the air quality resource.
Regional Haze/Visibility	No change from current condition.	Project emissions of haze precursor pollutants are sufficiently below regulatory thresholds to not warrant evaluation of haze/visibility impacts.	Same as Proposed Action.
Chemical Deposition	No change from current condition.	Predicted impacts from Project emissions comply with Montana and federal secondary air standards, which are protective with respect to chemical deposition impacts.	Same as Proposed Action.
Cultural/Tribal/Historic Resources			
Historic Properties	No change from current condition.	Historic properties would be avoided or would be mitigated with a SHPO-approved treatment plan.	Same as Proposed Action.
Groundwater Hydrology			
Groundwater Quantity	No change from current condition.	Mine dewatering would extensively lower groundwater levels around the mine, somewhat reducing base flow in nearby creeks; potentially impacting springs and seeps within the cone of depression. Operation of UIG would increase groundwater discharge, partially compensating mine-dewatering caused by decreased base flow. Operation of a NCWR would potentially increase groundwater discharge, partially compensating the mine-dewatering caused decrease in base flow.	Same as Proposed Action.
Groundwater Quality	No change from current condition.	The contact groundwater from post-mine voids ^b would migrate via shallow bedrock toward discharge zones mixing with non-contact groundwater; transport chemicals dissolved in contact groundwater would be retarded by process of adsorption; groundwater discharging to Sheep Creek would not affect its water quality.	Same as Proposed Action.
Surface Water Hydrology			
Runoff Surface Disturbance	No change from current condition.	Surface disturbance is less than 1% of local watershed area. Best management practices and the relatively small percentage of the total area (<1%) of stream and wetland features would be impacted through surface disturbance during construction.	Same as Proposed Action.
Stream Flows	No change from current condition.	Diversion of water to the NCWR falls within existing leased water rights along Sheep Creek (pending review and approval by the DNRC).	Same as Proposed Action.
		Secondary impacts on base flow of Sheep Creek as a result of mine dewatering and disposal of treated water to the UIG are expected to be insignificant and to partially offset one another. A more significant impact upon base flow would be possible for Coon Creek (70% reduction) during mine dewatering and recovery and pending approval by the DNRC it would require an agreement with the water rights holder. No other creeks are present within the area of a 10-foot drawdown of the water table, as computed by the groundwater model.	Same as Proposed Action.

Resource Area / Impact ^a	No Action Alternative	Proposed Action	Agency Modified Alternative
Water Quality	No change from current condition.	Process water discharged to surface waters via UIG would be treated and therefore not impact water quality in Sheep Creek. Post-closure exceedances of Montana Numeric Water Quality Standards (DEQ-7 Circular, May 2017) in underground water are expected to be attenuated and diluted by the time underground water migrates to Sheep Creek where more dilution occurs.	Same as Proposed Action.
Land Use and Recreation			
Existing Land Use	No change from current condition.	A total of 311 acres of existing land use would be impacted, which would be reclaimed back to existing uses after mine closure (i.e., 19 years).	Same as Proposed Action.
Hunting, Fishing, and Boating	No change from current condition. Recreational opportunities and use levels, patterns, and growth trends would be expected to continue at current rates.	No direct impacts on hunting opportunities would occur. There is abundant adjacent habitat for big game species surrounding the Project area. No secondary impacts on fishing or boating would occur from surface water.	Same as Proposed Action.
Population Increase	No change from current condition.	Recreational resource demands may be higher during construction and operations given the increase in local population from construction workers and mine operators; however, given the number and abundance of regional recreational opportunities, it is not expected that mine employee recreational resources use would significantly deprive other regional recreationists from enjoying the same resources.	Same as Proposed Action.
Visual and Aesthetics			
Visual Resources	No change from current condition.	Impacts to visual resources during construction caused by removal of existing vegetation, temporary fencing, grading, construction of roads and mine structures, and increased construction vehicle traffic would be short term, medium frequency, local in scope, and partially reversible. Impacts to visual resources after reclamation would be long term, medium frequency, and local in scope.	Same as Proposed Action.
Socioeconomics			
Population Increase	No change from current condition. Current population and use trends would continue.	The Proponent expects to hire up to 200 contractors during construction and employ an operating workforce of 235 employees. The associated population influx (i.e., the number of in-migrating workers and their family members) would be distributed across area county and town populations. Growth in population due to Project workforce would mean increased demand for and use of socioeconomic resources, such as housing, public infrastructure, and services. The nature and extent of these impacts would depend on where in-migrating populations choose to reside, the ability of public service providers to serve fluctuating populations, and the ability of area residents to adjust to (and accept) changes in life style.	Same as Proposed Action.
Employment, Income, and Tax Revenues	No change from current condition. Current employment, income and tax revenues trends would continue.	In addition to employment and income impacts, affected government units would benefit from the additional tax revenues generated by the mine.	Same as Proposed Action.
Soils			
Soil Loss	No change from current condition. Erosion and sedimentation would occur at current rates along the existing roads. Loss of soil development characteristics would be limited to new disturbances planned in the Project area in the reasonably foreseeable future.	A total of 283.7 acres of soils would be disturbed as part of the Project in areas of stockpiled and non-stockpiled soils. Total soil volumes of about 563,692 cubic yards would be salvaged and stockpiled long-term, and approximately 304,773 cubic yards of soils would be temporarily stored and replaced on site.	Same as Proposed Action.
Physical, Biological, and Chemical Characteristics	No change from current condition. Physical, biological, and chemical changes to soils would be minimized and limited to new disturbances planned in the Project area in the reasonably foreseeable future.	Short-term soil compaction impacts would occur as part of the Proposed Action. Biological impacts would occur in salvaged soils. No changes to soil pH values are expected from Project construction or operations.	Same as Proposed Action.

Resource Area / Impact ^a	No Action Alternative	Proposed Action	Agency Modified Alternative
Reclamation Impacts	No change from current condition.	The soils in the analysis area are generally suitable for salvage and reclamation. The majority of soils would be salvaged using a two-lift method, which improves reclamation success. The loss of soil development and the time required to rebuild a new soil profile would be unavoidable long-term Project impacts given the long-term storage of soil.	Same as Proposed Action.
Noise			
Sound Levels at Residential Receptors	No change from current condition.	Construction, operation, and mine closure could result in some audible noise at nearby residential receptors.	Same as Proposed Action.
Sound Levels at Recreational Receptors	No change from current condition.	Temporary blasting associated with mine construction could result in some audible noise at nearby recreational receptors in the Smith River area.	Same as Proposed Action.
Transportation			
Traffic Congestion	No change from current condition.	Project construction would generate an average of 160 employee daily vehicle movements (i.e., one trip to or from the Project site), along with 8 supply truck round trips per day. Project operations would generate up to 477 employee vehicle movements per day, 36 concentrate haul truck movements per day, and 12 other truck movements per day. Traffic generated by Project construction and operations would not meaningfully impact traffic capacity on analysis area roads. As a result, traffic congestion is a low-likelihood event during both construction and operations.	Same as Proposed Action. Additional backfilling would marginally increase truck traffic over a 4-year period. These additional trips would not meaningfully change the traffic impacts described for the Proposed Action.
Road Safety	No change from current condition.	During Project construction and operations, Project traffic could increase the chance of traffic incidents, degradation of roadways, and other risks to road safety. Non-Project drivers are likely to be already accustomed to varying road and weather conditions, as well as the presence of heavy truck traffic on analysis area roads. Proponent-recommended road and intersection improvements would further minimize impacts on road safety.	Same as Proposed Action. Additional traffic would not meaningfully change the traffic impacts described for the Proposed Action.
Vegetation			
Vegetation	Ongoing exploration and ranching activities may disturb vegetation within the Project area.	A total of 311 acres of vegetation would be disturbed, which would be reclaimed after mine closure (i.e., 19 years). No impacts to T&E species.	Same as Proposed Action.
Wetlands			
Wetland Fill, Hydrology, and Quality	Ongoing ranching activities may slightly disturb wetlands within the Project area.	A total of 0.85 acre of permanent direct impacts to wetlands would occur due to access/service roads, CTF, and the wet well for the Sheep Creek water diversion. No secondary impacts expected due to fragmentation, hydrology changes, or water quality.	Same as Proposed Action.
Wildlife			
Habitat	Continued exploration activities and agricultural use of Project site could affect habitat.	A total of 311 acres of habitat removal, to be reclaimed after mine closure (i.e., 19 years).	Same as Proposed Action.
Direct Mortalities	Ongoing potential for wildlife-vehicle collisions due to private recreational and agricultural use of the land.	Low likelihood of wildlife-vehicle collision for T&E species. Medium likelihood for big game species and other species of concern. No population-level impacts anticipated.	Potential increased adverse impact compared to Proposed Action. Potentially a slight increase in mortalities as more vehicle traffic onsite associated with additional backfilling. Fencing would limit potential impacts to birds and small mammals.
Displacement	Wildlife occasionally disrupted by exploration activities or recreational use.	Wildlife likely disrupted within 1 to 2 miles of the Project throughout the life of the mine.	Same as Proposed Action.
Water Quality and Quantity	No change from current condition.	Process water discharged to surface waters via the UIG would be treated to avoid impacts to wildlife. Potential contamination for avian species ingesting water from CWP brine pond. There would be no adverse impacts related to water quantity.	Same as Proposed Action.

Resource Area / Impact ^a	No Action Alternative	Proposed Action	Agency Modified Alternative
Aquatic Biology			
Stream Crossings and Sedimentation	Ongoing potential for increased sedimentation from continued exploration activities, ranching, and fishing activities.	The two crossings combined would affect 0.1 acre of riparian wetlands, 85 feet of Little Sheep Creek, and 69 feet of the Brush Creek tributary to Little Sheep Creek, disturbing aquatic habitat and potentially introducing sediment into the aquatic system and affecting spawning fish.	Same as Proposed Action.
Changes in Water Quantity	Aquatic biota may be impacted by exploration and ranching activities when water is withdrawn for use. Otherwise, no change from current condition.	Aquatic biota, particularly in Coon Creek, could be impacted by changes in hydrology due to mine dewatering during operations. The Proponent proposes to augment flows with water from the NCWR.	Same as Proposed Action.
NCWR Wet Well and Pipe	No change from current condition.	Aquatic biota could be impacted by the installation of the intake pipe. Further impacts likely due to the presence of the intake pipeline include entrainment and impingement of fishes and invertebrates; alteration of natural flow rates when water is pumped (when the flow in Sheep Creek exceeds 84 cubic feet per second); degradation of shoreline and riparian habitats; and alteration of aquatic community structure and diversity.	Same as Proposed Action.
Changes in Water Quality	No change from current condition.	Process water discharged to surface waters would be treated to avoid impacts to wildlife.	Same as Proposed Action.
Thermal Impacts	No change from current condition.	The assumption is that the temperature of the UIG discharge would equilibrate to the ambient groundwater temperature prior to discharging to any surface water resources. If stream flow were to be augmented via direct discharge from the NCWR, the temperature would be monitored, and discharges limited as necessary, in order to prevent impacts to aquatic life.	Same as Proposed Action.

CTF = Cemented Tailings Facility; CWP = Contact Water Pond; MPDES = Montana Pollutant Discharge Elimination System; NCWR Non-Contact Water Reservoir; PWP = Process Water Pond; SHPO = State Historic Preservation Office; T&E = threatened and endangered; UIG = Underground Infiltration Gallery

Notes:

^a Impacts include direct and secondary impacts, as well as severity, probability, and duration of impact.

^b A “void” is the space from which the ore was removed.

7. REFERENCES

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