

# Draft Environmental Impact Statement for the Arturo Mine Project



Bureau of Land Management

Elko District Office, Tuscarora Field Office, Nevada

December 2012



***BLM Mission Statement***

*It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.*

BLM/NV/EK/ES/12-18+1793



# United States Department of the Interior



## BUREAU OF LAND MANAGEMENT

Elko District Office  
3900 East Idaho Street  
Elko, Nevada 89801

[http://www.blm.gov/nv/st/en/fo/elko\\_field\\_office.html](http://www.blm.gov/nv/st/en/fo/elko_field_office.html)

In Reply Refer To:  
3809 (NVE02000)  
NVN-87946

Dear Reader:

Enclosed for your review is the Draft Environmental Impact Statement (DEIS) for Barrick-Dee Mining Venture Inc.'s (BDMV) proposed Arturo Mine Project. The proposed Project includes the expansion of the existing open pit, construction of two new waste rock disposal storage facilities, construction of a new heap leach facility, and the construction of new support facilities (i.e. substation and associated transmission powerline, water wells, office, and roads). Mill grade mined material would be transported to Barrick's Goldstrike Mine Facility for processing. No dewatering is proposed for this project. The proposed project would create approximately 2,703 acres of surface disturbance on public land administered by the BLM. The project life is approximately ten years of mining and ore processing and will employ 240 workers. The proposed project is located approximately 45 miles northwest of Elko, in Elko County, Nevada at the previously authorized Dee Gold Mine site.

A 45-day public comment period begins the day the Environmental Protection Agency publishes the Notice of Availability in the Federal Register. You may submit comments related to the Arturo Mine Project by any of the following methods:

- E-mail: [BLM\\_NV\\_ELDOArturoEISTeam@blm.gov](mailto:BLM_NV_ELDOArturoEISTeam@blm.gov);
- Fax: 775-753-0255; or
- Mail: Bureau of Land Management, Arturo Mine Project, Attention: John Daniel, Project Manager, 3900 Idaho Street, Elko, NV 89801.

Copies of the Arturo Mine Project DEIS are available in the BLM Elko District Office at the above address, and on line at [http://www.blm.gov/nv/st/en/fo/elko\\_field\\_office.html](http://www.blm.gov/nv/st/en/fo/elko_field_office.html).

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Should you have any questions, please contact John Daniel at (775) 753-0277.

Sincerely,

Richard E. Adams,  
Field Manager  
Tuscarora Field Office

**ARTURO MINE PROJECT  
DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)**

<b>Project Name:</b>	Draft Environmental Impact Statement Barrick-Dee Mining Venture
<b>Lead Agency:</b>	U.S. Department of the Interior Bureau of Land Management Elko District Office, Tuscarora Field Office Elko, Nevada
<b>Cooperating Agencies:</b>	Nevada Department of Wildlife Elko County Board of Commissioners
<b>Project Location:</b>	Elko County, Nevada
<b>Correspondence on this EIS Should be Directed to:</b>	John Daniel, EIS Project Coordinator Bureau of Land Management Tuscarora Field Office 3900 Idaho Street Elko, NV 89801
<b>Date by which Comments Must be Postmarked to BLM:</b>	Within 45 days of the date of the Notice of Availability published in the Federal Register

**ABSTRACT**

This Draft Environmental Impact Statement analyzes potential impacts associated with Barrick-Dee Mining Venture (BDVM) proposal for the Arturo Mine Project (Proposed Action). The Proposed Action is to develop the Arturo Mine Project which includes the expansion of the Dee Gold Mine and the construction of new process and ancillary facilities. The proposed project is located in the northern end of the Carlin Trend, approximately 45 miles northwest of Elko, in Elko County, Nevada at the existing Dee Gold Mine site. The proposed Project includes the expansion of the existing open pit, construction of two new waste rock disposal storage facilities, construction of a new heap leach facility, and the construction of new support facilities (i.e., substation and associated transmission powerline, water wells, office, and roads). Mill grade ore would be transported to Barrick's Goldstrike Mine Facility for processing. No dewatering is proposed for the Arturo Mine Project. The proposed project would create approximately 2,703 acres of surface disturbance on public land administered by the BLM. The project life is approximately 10 years of mining and ore processing and would employ 240 workers. The agency preferred alternative is the Proposed Action.

<b>Responsible Official for Draft EIS:</b>	Richard E. Adams, Field Manager Tuscarora Field Office
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## Executive Summary

### Introduction

Barrick-Dee Mining Venture (BDMV) proposes to construct, operate, and reclaim the Arturo Mine Project (Proposed Action/project), which would include development of new facilities and expansion of previously disturbed gold mining areas at the Dee Gold Mine. BDMV is a joint venture between Barrick Gold Exploration Inc., the venture manager, and Marigold Mining Company (Marigold), a subsidiary of Goldcorp Inc. The proposed project is located on the northern end of the Carlin Trend in Elko County, Nevada, approximately 27 aerial miles northwest of the town of Carlin.

### Summary of the Proposed Action

BDMV is proposing an expansion of the existing Dee Gold Mine, which currently is in reclamation and closure. A Plan of Operations (NVN-087946) for the proposed project was submitted by BDMV to the Bureau of Land Management (BLM) in June 2009. The Proposed Action would include expansion of the existing open-pit; construction of two new waste rock disposal facilities (WRDFs) (the East and West WRDFs); construction of a new heap leach pad (Heap Leach Pad No. 12) and gold processing facilities; upgrading and re-aligning segments of the Bootstrap Haul Road, including light vehicle access; construction and/or relocation of support facilities, including office buildings and a communication site; construction and installation of new power transmission lines; and continued surface exploration within the project area.

Mill-grade ore would be transported via the Bootstrap Haul Road right-of-way (ROW) NVN-007683 and processed by contract at the existing Barrick Goldstrike Mines Inc. (BGMI) facilities located approximately 3.5 road miles southeast of the existing Dee Gold Mine. Low-grade leachable ore would be processed on-site at the proposed heap leach pad and associated processing facilities.

The Proposed Action would disturb a total of 2,774 acres, of which 2,703 acres are public lands administered by the BLM and 71 acres are private land. The proposed surface disturbance would include 269 acres of existing disturbance, 543 acres of reclaimed mining disturbance, and 1,962 acres of new disturbance.

Proposed project construction would begin in early 2013 pending authorization of permits and approvals. Mine operations would begin within 8 months of construction start-up, and would continue for approximately 8 years depending on mining and economic conditions. Ore processing would continue for an additional 2 years beyond the end of mining operations. To the extent possible, reclamation would occur concurrently with mining operations. Final reclamation would be completed during a 4-year period following cessation of mining. At the end of mine life, BDMV would reclaim all the facilities associated with the project, except the expanded pit and roads included in the BLM road system. Post-closure monitoring could continue for 30 years or more, depending on the project's final closure plan and its implementation.

### Summary of the Project Alternatives

Three alternatives to the Proposed Action were considered for detailed analysis in the environmental impact statement (EIS): the Single WRDF, Partial Pit Backfill, and the No Action alternatives. Five other alternatives were considered but eliminated from detailed analysis.

## **Summary of Impacts Associated with the Proposed Action and Alternatives**

### **Geology and Minerals**

Direct impacts on geologic and mineral resources from the Proposed Action would include: 1) the generation and permanent disposal of approximately 600 million tons (MT) of waste rock and 64 MT of spent ore material, and 2) the mining of proven and probable ore reserves of approximately 2.2 million ounces of gold and 10.6 million ounces of silver.

The construction and operation of the proposed open pit, WRDFs and heap leach pad would permanently alter the natural topographic and geomorphic features over approximately 2,123 acres, including 601 acres of open pit that would not be reclaimed. The WRDFs and heap leach pad would be reclaimed but would alter the topography and geomorphology of the study area. Other temporary facilities including approximately 651 acres of stockpiles, process facilities, ancillary facilities, and haul roads would be reclaimed to the approximate pre-mining topography and therefore would not permanently alter the natural topography and geomorphic features in the study area.

Geotechnical studies and stability analysis of the proposed open pit, WRDF and heap leach facility indicated that the facilities would be stable during construction and operation of the proposed project. Additional geotechnical studies would be incorporated into the final design, operation and maintenance procedures, and closure of these facilities and the process area ponds.

### **Water Resources and Geochemistry**

No perennial stream reaches are located within the study area. Based on the lack of perennial stream reaches, the short reaches of relatively small ephemeral drainages removed by proposed project components, and the proposed storm water management controls; direct impacts to stream flows in Boulder Creek and the Antelope Creek drainage would be minimal. The U.S Army Corp of Engineers has concurred that water features in the proposed project area are not subject to federal jurisdiction, and thus not regulated under Section 404 of the Clean Water Act.

Twelve seep features would be affected either by burial under proposed project components or by removal of water sources adjacent to the proposed pit expansion. These impacts would minimally affect surface water or groundwater resources, and would primarily involve habitat effects. Springs would not be affected by the Proposed Action.

Mine dewatering would not be required for the Proposed Action due to the influence of pumping at the BGMI facility. Any pumping required to control localized perched groundwater during open-pit mining is unlikely to result in additional drawdown in the carbonate aquifer over that which has been previously predicted and analyzed for the BGMI facility. Dewatering at the BGMI facility is predicted to end in 2021, after which regional groundwater levels gradually would rise. After dewatering ceases at the BGMI facility, the groundwater levels in the carbonate aquifer would rise above the bottom of the proposed open pit and result in the development of three separate pit lakes in the North, South, and East lobes of the open pit. The groundwater model predicts that during the early stages of recovery, local water tables would develop in the Carlin and Vinini formations that represent perched groundwater systems above the carbonate aquifer system. After approximately 200 years of recovery, the pit lakes are expected to behave as a hydrologic sink (i.e., hydrologic capture zone where there is groundwater inflow that is lost to evaporation and, therefore, no outflow to the groundwater system). The pit lakes predicted water chemistries exceed some water quality standards; however, it is anticipated that in the long term (after approximately 200 years), these lakes would not affect the water quality of downgradient aquifers.

The Proposed Action would not affect water rights in the project area.

The WRDFs are designed and would be constructed to minimize the risk of impact to waters of the State and impacts to groundwater and surface water from seepage from the WRDFs are anticipated to be negligible. Soil covers implemented at closure would reduce or eliminate infiltration of water and oxygen. A waste rock management plan provides for a selective waste rock handling program, which incorporates the net alkaline character of waste rock and the relatively small volume of potentially acid-generating material (PAG) for the proposed project.

Because the proposed project would be designed and operated as a zero-discharge facility in accordance with NDEP mining regulations, impacts from process fluids would be unlikely under anticipated construction and operating conditions. Compliance with interagency closure and reclamation requirements, including monitoring, would minimize the potential for long-term effects on surface water quality after cessation of proposed project operations. Based on these project commitments, no impacts to surface water quality are anticipated from process components under anticipated construction, operating, and closure conditions.

Arturo ore processing at the BGMI facility would be conducted under currently permitted authorizations. As a result, no additional impacts to surface water quality are anticipated from ore processing at the existing BGMI process facilities. Incremental water quality impacts to Boulder or Bell creeks are not anticipated from the Bootstrap Haul Road modification and maintenance.

### **Cultural Resources**

A total of 29 National Register of Historic Places (NRHP)-eligible prehistoric sites that cannot be avoided by project construction have been, or would be, mitigated through implementation of a Historic Properties Treatment Plan and in accordance with the Memorandum of Agreement developed by the BLM Elko District Office in consultation with the State Historic Preservation Office (SHPO). There would be an opportunity for Native American monitors to be present during data recovery. The BLM and SHPO-approved Historic Properties Treatment Plan would be implemented prior to BLM issuing a notice to proceed. If any previously unknown archaeological sites or human remains are discovered during construction, all construction activities would immediately cease within 300 feet of the discovery, and the BLM Authorized Officer would be notified of the find. Steps would be taken to protect the site from vandalism or further damage until the BLM Authorized Officer evaluated the nature of the discovery.

### **Native American Traditional Values**

In consultation with the Nevada State Historic Preservation Office and the Tribes, the BLM would determine whether construction and operation of the proposed project would have an adverse effect on any historic properties of traditional religious and cultural importance to the Tribes. If the BLM determines that historic properties of traditional religious and cultural importance would be adversely affected, mitigation would be proposed. The inadvertent discovery of human remains would follow the procedures stated in the Native American Graves Protection and Repatriation Act. Potential effects to Native American traditional values as a result of the proposed project could include potential damage to archaeological sites, illegal collecting of artifacts, and effects to springs, seeps, and streams. Impacts to archaeological sites from proposed surface disturbance activities have been or would be mitigated according to the HPTP by site avoidance or data recovery. No illegal collecting of artifacts or looting would occur because all of the historic properties located within or adjacent to the study area have been or would undergo data recovery prior to project construction.

Government-to-government consultation is ongoing regarding potential effects to any identified properties of traditional religious and cultural importance and graves/burials and their possible mitigation.

### **Hazardous Materials and Solid Waste**

The transport, storage, use, and disposal of hazardous materials would occur during the construction and operation of the proposed project in accordance with federal, state and local regulations. Based on the facility's design features and the operational practices in place, the probability of a major release occurring at the site or along transportation routes would be low. Any release would be reported and mitigated according to federal and state law.

All hazardous waste generated at the mine would be accumulated and transported to licensed disposal facilities in accordance with applicable federal and state regulations. The proposed project would be classified as a Small Quantity Generator under RCRA. Non-hazardous solid waste would be disposed of in the proposed Class III waived landfill located within the proposed West WRDF or other off-site permitted landfill.

### **Air Quality**

Air dispersion modeling results indicate that the proposed project would not exceed state or national Ambient Air Quality Standards for PM<sub>2.5</sub>, PM<sub>10</sub>, nitrogen dioxide, carbon monoxide, and sulfur dioxide.

No individual hazardous air pollutants (HAPs) would be emitted in a quantity greater than the major source limit of 10 tons per year (tpy), and the combined HAP emissions are less than the major source limit of 25 tpy. Therefore, the Proposed Action would not constitute a major HAP source.

Fugitive and combustion emissions (criteria pollutant emissions) were quantified for hauling ore from the proposed project to the BGMI facility along the Bootstrap Haul Road. Additionally, an estimate of criteria pollutants and HAPs emissions attributed to processing ore from the proposed project at the BGMI facility (under the BGMI existing air permit) was completed. The maximum potential hourly emissions of mercury at the BGMI facilities would not increase due to the processing of Arturo ore, and there would be no projected increases in total annual mercury emissions from the facility.

### **Paleontological Resources**

Destruction, damage, or loss of fossils could potentially occur from general construction activities, waste rock disposal, heap leach facility, and pit development in the Carlin Formation, which has a potential to contain scientifically important fossils, especially vertebrates. However, recent surveys of the Carlin Formation within the vicinity of the proposed project and CESA have resulted in the collection of few recognizable vertebrate fossils.

There is a very low risk of impacts to fossils on previously authorized disturbed lands. Proposed disturbance is not likely to affect paleontological resources in the Paleozoic rocks and alluvium because these rock units have a low potential to contain scientifically important fossils.

### **Social and Economic Values**

The Proposed Action would result in temporary increases in local construction jobs and longer-term increases in mining sector employment primarily in Elko and Eureka counties. The Proposed Action would employ approximately 100 construction workers during the construction phase of the project. The maximum employment impact during construction represents less than 0.4 percent of total employment in the two-county study area.

The Proposed Action would employ an average of more than 200 workers during the operations and processing phase of the project. At its peak, the maximum operations employment effect would be approximately 659 workers, including indirect employment. The 2016 peak employment during operations would represent a 2.6 percent increase over total 2008 employment in the two-county study area. It would reduce the unemployment rate to approximately 5.8 percent, if all of the jobs were filled

by new hires from the local area. No significant capacity or service issues have been identified for public facilities, services, or education in the two-county study area.

The estimated average annual payroll, including benefits, for proposed project salaried and hourly workers combined would be \$84,000. Consequently, the direct payroll would range from \$4.2 million (2020) to \$31.8 million (2016) and would total approximately \$159.1 million during the 8-year operating life of the mine. The annual indirect earnings effect would range from \$1.5 million to \$11.8 million and the total combined effect would be approximately \$218.0 million during the operating life of the project. The increase in income earnings would be a substantial economic benefit accruing to the local economy.

The proposed project would generate public revenues primarily from sales and use taxes and net proceeds of mines taxes. BDMV estimates the project would pay sales taxes of \$1.4 million in 2013 and \$0.8 million in 2014. Estimated sales taxes in subsequent years would range from \$39,000 to \$179,000, and would average approximately \$105,000 per year. Total sales taxes over the 8 year project life are estimated at \$2.8 million, divided among the state (\$826,000), the school districts (\$1,074,000), Elko County (\$207,000) and the counties revenue sharing pool (\$723,000). BDMV estimates total net proceeds taxes from the proposed project at \$34.8 million, ranging from \$352,000 in 2013 to \$9.8 million in 2020, although with considerable variation over the 8-year mine life.

### **Recreation and Wilderness**

The proposed project would add approximately 1,962 acres to the existing or reclaimed disturbance of 812 acres. The proposed disturbance areas would be removed from public access for recreation purposes for the life of the project. Upon completion of mining, ore processing, closure, and reclamation, approximately 601 acres of disturbed land associated with the open pit would remain unreclaimed, but 2,173 reclaimed acres would be available for dispersed recreation use. Because there is an ample supply of alternative land for dispersed recreation activities in the project vicinity, and because no unique recreation resources would be impacted as a result of the proposed project, effects on recreation resources would be considered minor.

The project area does not contain any land that meets the criteria for wilderness characteristics or designation. There would be no adverse effects from the proposed project on wilderness or wilderness study areas.

### **Visual Resources**

Development of the proposed project would expand the amount of visual contrast that currently exists between existing and previously approved facilities, and the natural character of the landscape. The primary change in visual effects would be the addition of landforms of the West WRDF, East WRDF, Heap Leach Pad No. 12, new mine facilities buildings, and the power transmission line. The proposed project also would extend visual effects through the increased use and activities of the area from the proposed mining activity. The proposed facilities would have visual characteristics during active mining that would be similar to existing facilities, notably a geometric form and exposed earth surfaces. As a result, the proposed project would have similar, but expanded, visual effects to those already occurring from the existing facilities. The visual contrast effects would become less prominent with reclamation.

The proposed project would comply with the Class IV objective during active mining and after reclamation because this objective provides for "management activities, which require major modification of the existing character of the landscape." In addition, public use of travel routes in the viewshed would occur at a low level.

### **Soils and Reclamation**

The Proposed Action would disturb approximately 2,505 acres of soil from areas previously disturbed but reclaimed (543 acres) or new land disturbance (1962 acres). Replacement of growth media and revegetation of disturbed areas would be conducted as soon as practical to minimize impacts to soils and vegetation and facilitate post-mining land uses. Impacts would be reduced based on BDMV's commitment to reclaim project components and successfully restore productive post-mining land uses. It is likely that short- to long-term (e.g., up to 10 years or more) decreases in soil quality would not limit the attainment of overall post-mining land use objectives. Over time, soil quality on reclaimed and revegetated sites would resemble pre-mining conditions. A permanent loss of soil productivity would occur on approximately 472 acres of previously reclaimed or newly disturbed land with expansion of the proposed open pit which would not be reclaimed.

### **Vegetation Resources**

The proposed project would disturb approximately 2,774 acres of which 1,960 acres are sagebrush shrublands, 2 acres are riparian zones/wetland areas, 543 acres are reclaimed grasslands from previous mining disturbance, and 269 acres are existing disturbance. The majority of the proposed surface disturbance (approximately 2,173 acres) would be reclaimed with the 601 acres of the open pit remaining unreclaimed post-closure.

The construction of the open pit would affect three wetlands. Widening and realigning the Bootstrap Haul Road would disturb an additional two wetlands where the road crosses the Boulder Creek stream channel. The potential impacts of the proposed project on riparian zones and wetlands would predominantly be long-term, consisting of permanent changes irrespective of post-closure and reclamation success. Mitigation of project-related impacts that would affect 1.6 acres of riparian and wetland vegetation would include the enhancement and restoration of 34 acres of vegetation, including three springs, located at an offsite location within the Water Canyon spring complex.

Satisfactory revegetation of disturbance areas is anticipated to occur approximately 3 to 15 years following reclamation. After 25 years, the reclaimed plant communities likely would consist of adequate herbaceous plant cover with sufficient diversity to substantially reduce the potential for soil erosion and provide forage for use by livestock and wildlife.

### **Noxious Weeds and Non-native Invasive Plant Species**

Implementation of the measures outlined in BDMV's applicant-committed environmental protection measures and the proposed reclamation plan and weed management plan would reduce the potential for noxious weeds and non-native invasive plant species establishment in the area. Measures to be implemented to prevent the spread of noxious weeds would include seeding growth media stockpiles as soon as practical with an interim seed mix, using certified weed-free hay and straw, and reclaiming with a BLM- approved seed mix.

### **Range Resources**

The proposed project would exclude 3,333 acres of rangeland vegetation in the Twenty Five Allotment and 24 acres of rangeland vegetation in the T Lazy S Allotment from grazing. Animal Unit Months (AUMs) suspended directly from the proposed project would be approximately 687 AUMs in the Twenty Five Allotment. AUMs suspended based on the proposed project in combination with the current configuration of the Boulder Seeding Fence would total 1,272 AUMs in the Twenty Five Allotment. Long-term impacts would result in the loss of 472 acres and a reduction of 95 AUMs within the Twenty Five Allotment from the expansion of the existing open pit, which would not be reclaimed.

The proposed project would result in the short-term loss of forage during facility construction, operation, and reclamation of the proposed project; and a long-term loss of forage from the expansion of the open pit. The installation of the perimeter fence would result in the loss of forage, restrict cattle

movement, and limit access to water sources. An increase in traffic, especially along the Bootstrap Haul Road, could lead to increased mortality and injuries to livestock, and cause disruptions to livestock management. Vehicle traffic along the Bootstrap Haul Road would disrupt livestock management during seasonal cattle movements between summer and winter grazing areas.

Indirect impacts would include the potential spread of noxious weeds and non-native invasive plant species, and an increase in fugitive dust that could result in a reduction of forage and forage quality. The conversion of native vegetative communities and associated loss of forage could potentially be a permanent change resulting in a long-term impact. Water quality in ponds and reservoirs could be impacted as a result of erosion from construction activities.

Impacts to grazing resources would be minimized through the implementation of applicant-committed environmental protection measures including measures to facilitate cattle movement and to provide additional water sources during seasonal cattle drives. In addition, the existing Boulder Seeding Fence would be reconfigured to reduce the amount of AUMs affected by the Proposed Action.

### **Wildlife**

The proposed project would result in the long-term reduction of approximately 2,505 acres of wildlife habitat, including approximately 1,960 acres of sagebrush shrubland, 543 acres of grassland, and approximately 2 acres of riparian zones/wetland areas. The disturbed habitat associated with the proposed project would be reclaimed following completion of mining activities with the exception of 472 acres of sagebrush shrubland, grassland and wetland associated with the open pit expansion. Mitigation of project-related impacts that would affect riparian and wetland vegetation would include the enhancement and restoration of 34 acres of vegetation, including three springs and five pit reservoirs, located at an offsite location within the Water Canyon spring complex.

Indirect impacts would include increased noise, additional human presence, and the potential for increased vehicle-related mortalities. No fish or amphibian species were observed in the three wetlands in the open pit expansion and the two wetlands at the Bootstrap Haul Road crossing over Boulder Creek that would be lost as a result of the project.

The proposed project occurs within an important mule deer migration corridor. Potential direct impacts to big game (mule deer, pronghorn, and elk) would include the incremental long-term reduction of potential forage and the incremental increase in habitat fragmentation from vegetation removal associated with mine development activities. The project would disturb approximately 1,391 acres of limited use habitat for mule deer, consisting primarily of sagebrush shrubland habitat, and 2,505 acres of summer habitat for pronghorn. Potential direct impacts to elk would include the incremental long-term reduction of approximately 1,940 acres of crucial winter habitat within the study area and approximately 19 acres of low-density habitat. Mitigation of project-related impacts that would affect 1,391 acres of sagebrush shrubland habitat for migrating mule deer would include the enhancement and restoration of important summer and winter mule deer range at offsite locations at a ratio of 1:1. In addition, disturbed areas would be reclaimed as soon as possible to increase the width of the remaining migration corridor and to encourage use by mule deer and other big game.

Direct impacts to small game and nongame species would include the incremental long-term reduction of approximately 2,505 acres of potentially suitable habitat. Impacts also would include displacement from the disturbance areas and increased habitat fragmentation, until reclamation has been completed and vegetation is re-established.

Potential direct impacts to bird species would include the temporary loss of approximately 2,505 acres of potentially suitable breeding, roosting, and foraging habitat. However, this temporary loss is expected to have little effect on local bird populations based on the amount of suitable breeding and foraging habitat in the surrounding area. Additionally, a number of applicant-committed environmental protection measures would be implemented to minimize impacts.

Applicant-committed environmental protection measures involving erosion and sediment control BMPs would be used to reduce sediment input from project facilities and disturbed areas into Boulder Creek, as defined by the site Storm Water Pollution Prevention Plan. By implementing the erosion control measures, project-related impacts of sediment on Boulder Creek and aquatic biota are considered to be minor. No impacts due to water management activities would occur to habitat along Boulder Creek and associated aquatic species.

### **Special Status Species**

Impacts to some special status species would include the long-term loss of approximately 2,505 acres of potentially suitable habitat. Based on the limited habitat to be disturbed and available habitat in the vicinity, potential impacts to these species as a result of the proposed project would be low. A long-term loss of approximately 1,960 acres of potentially suitable sagebrush shrubland habitat would potentially impact some special status species. These impacts would be considered low considering the small amount of disturbance and the availability of similar habitat in the study area. Mitigation of project-related impacts that would affect approximately 808 acres of important greater sage-grouse habitat would include the enhancement and restoration of important greater sage-grouse habitat at offsite locations at a ratio of 2:1.

Habitat loss or alteration would result in direct losses of smaller, less mobile species of wildlife, such as small mammals, and the displacement of more mobile species into adjacent habitats. In areas where habitats are at, or near, carrying capacity, animal displacement could result in some unquantifiable reductions in local wildlife populations. Mine-related surface disturbance also would result in an incremental increase in habitat fragmentation at the mine site until vegetation has been re-established.

### **Land Use and Access**

The project area encompasses approximately 3,627 acres of which 3,551 acres are public lands administered by the BLM and approximately 76 acres are private lands. The proposed project would disturb a total of 2,774 acres of public (2,703 acres) and private (71 acres) land including 269 acres of existing disturbance; 543 acres of reclaimed mining disturbance, and 1,962 acres that would result in new land disturbance.

New project-related disturbance including a new fenced area around the proposed PoO boundary would reduce the amount of land available for livestock grazing and dispersed recreation, although the loss would be small relative to the total public land available for such activities in the project vicinity.

The proposed project would not conflict with the few existing ROWs in the project vicinity. The proposed changes to the existing power transmission line would not adversely affect land use or power availability in the area.

Post-reclamation land use of most of the disturbance area would be returned to open space, grazing, dispersed recreation, and wildlife habitat and would be consistent with local and BLM land use plans and guidelines.

Four categories of traffic would be generated on public roadways by the proposed project including construction traffic, worker commuting traffic, general company and contractor traffic, ore hauling, and material deliveries. Most traffic would access the project site using the Bootstrap Haul Road via SR 766 and Rodeo Flat Road (County Road 237a). Transportation safety concerns related to traffic generated by the proposed project would be minimal. The increase in traffic would be modest, remaining well within the capacity of the roadways. Development of the proposed project would not substantially affect highway traffic in the project region.

### **Noise**

Noise levels substantially higher than ambient background noise levels would be generated in close proximity to the main noise generating activity centers including the open pit, the West WRDF, the East WRDF, the Heap Leach Pad No. 12, and mine traffic along the Bootstrap Haul Road. The noise from blasting would be increasingly reflected upward by the pit walls as the pit depth increased, which would reduce the noise levels outside the pit.

Noise level effects from the proposed project would be negligible as no identified noise-sensitive receptors were identified in the noise effects study area, and relatively modest noise levels were estimated from project-related activities.

### **Environmental Justice**

The environmental analyses indicate that the potential effects of the proposed project would not be expected to disproportionately affect any particular population. The area in the immediate vicinity of the proposed project has no resident population. The nearest residences are a few remote ranches located several miles from the project area that have not been identified as minority or low-income in nature.

### **Energy Requirements and Climate Change**

Greenhouse Gas (GHG) emissions associated with the Proposed Action would contribute approximately 80,220 CO<sub>2</sub>(e) tpy from fuel combustion and 25,901 CO<sub>2</sub>(e) tpy from electrical power for a total of 106,121 CO<sub>2</sub>(e) tpy of GHG.

The proposed project would emit CO<sub>2</sub>(e) that would incrementally add to the GHGs in the region from other sources including power plants, mining activities, industrial operations, vehicle traffic, wildfires, and other activities. The proposed project represents approximately 1 percent of the GHG emissions from all sources in the region, approximately 0.04 percent of the emissions in Nevada, and a tiny fraction of the emissions on a global basis. As a result, the proposed project would be expected to have a negligible effect on climate.

### **BLM-preferred Alternative**

The Council on Environmental Quality Regulations (40 CFR 1502.14e) directs that an EIS “identify the agency’s preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference.”

The BLM has selected an alternative based on the analysis in this EIS. The preferred alternative is one that best fulfills the agency’s statutory mission and responsibilities, considering economic, environmental, technical, and other factors. The BLM has determined the preferred alternative is the Proposed Action.

**Acronyms and Abbreviations**

°C	degrees Celsius
°F	degrees Fahrenheit
µg/m <sup>3</sup>	micrograms per cubic meter
AAQS	Ambient Air Quality Standards
ACHP	Advisory Council on Historic Preservation
afy	acre feet per year
AGFD	Arizona Game and Fish Department
AGP	acid generation potential
ags	above ground surface
AIRFA	American Indian Religious Freedom Act
amsl	above mean sea level
ANP	acid neutralizing potential
APE	Area of Potential Effect
APLIC	Avian Power Line Interaction Committee
ARD	acid rock drainage
ARPA	Archaeological Resources Protection Act
AUM	animal unit month
BAPC	Bureau of Air Pollution Control
BATF	Bureau of Alcohol, Tobacco, and Firearms
BCC	Birds of Conservation Concern
BDMV	Barrick-Dee Mining Venture
BEA	Bureau of Economic Analysis
BGMI	Barrick Goldstrike Mines Inc.
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	Best Management Practices
BMRR	Bureau of Mining Regulation and Reclamation
BVMP	Boulder Valley Monitoring Plan
CAA	Clean Air Act
CAAA	Clean Air Act Amendments of 1990
CDC	Centers for Disease Control
Cedar Creek	Cedar Creek Associates, Inc.
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act

CESA	Cumulative Effects Study Area
CFR	Code of Federal Register
CH <sub>3</sub> Hg <sup>+</sup>	methylmercury
CH <sub>4</sub>	methane
CIL	carbon-in-leach
CN	cyanide
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> (e)	carbon dioxide equivalent
COPC	constituent of potential concern
CWA	Clean Water Act
dBA	decibels on the A-weighted scale
DWR	Division of Water Resources
EA	Environmental Assessment
ECPLPP	Elko County Public Lands Policy Plan
EIS	Environmental Impact Statement
EO	Executive Order
EPCRA	Emergency Planning and Community Right-to-Know Act
ERA	ecological risk assessment
ESA	Endangered Species Act
ET	evapotranspiration
FEMA	Federal Emergency Management Agency
FLPMA	Federal Land Policy and Management Act of 1976
FR	Federal Register
FY	fiscal year
GBC	Great Basin College
GHG	greenhouse gas
Goldcorp	Goldcorp Inc.
gpm	gallons per minute
GWP	global warming potential
HAP	hazardous air pollutant
HDPE	high density polyethylene
Hg <sup>0</sup>	gaseous mercury
HPTP	Historic Properties Treatment Plan
HQ	hazard quotient
HUD	Housing and Urban Development

I-80	Interstate 80
IMPROVE	Interagency Monitoring of Protected Visual Environments
IPCC	Intergovernmental Panel on Climate Change
JBR	JBR Environmental Consultants, Inc.
JSA	John Shomaker & Associates, Inc
kg/t	kilograms per ton
KOP	key observation points
kV	kilovolt
LCRS	leak collection and recovery system
L <sub>dn</sub>	day-night average sound levels
L <sub>max</sub>	maximum sound level
LOAEL	lowest observed adverse effect level
LOEC	lowest observed adverse effect concentrations
MACT	Maximum Achievable Control Technology
Marigold	Marigold Mining Company
MBTA	Migratory Bird Treaty Act
MC	Maggie Creek
MCL	Maximum Contaminant Levels
MCP	Mercury Control Program
mg/l	milligrams per liter
mgd	million gallons per day
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MSA	Micropolitan Statistical Area
MSDS	Material Safety Data Sheets
MSHA	Mine Safety and Health Administration
MT	million tons
MWMP	Meteoric Water Mobility Procedure
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NAG	net acid generating
NAGPRA	Native American Graves Protection and Repatriation Act
NDEP	Nevada Division of Environmental Protection
NDETR	Nevada Department of Employment Training, and Rehabilitation
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife

NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act
NNHP	Nevada National Heritage Program
NNP	net-neutralizing potential
NO <sub>2</sub>	nitrogen dioxide
NOA	Notice of Availability
NOAEL	no observed adverse effect level
NOEC	no observed effect concentrations
NOI	Notice of Intent
NO <sub>x</sub>	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRS	Nevada Revised Statute
NSPS	New Source Performance Standards
NSR	New Source Review
NVCRIS	Nevada Cultural Resources Information System
NVMACT	Nevada Maximum Achievable Control Technology
NWR	National Wildlife Refuge
O <sub>3</sub>	ozone
OSHA	Occupational Safety and Health Administration
P.L.	Public Law
PAG	potentially acid generating
Pb	lead
PCPI	per capita personal income
PCS	Petroleum-contaminated Soils
PFYC	Potential Fossil Yield Classification
PIF	Partners in Flight
PM	particulate matter
PM <sub>10</sub>	particulate matter with an aerodynamic diameter of 10 microns or less
PM <sub>2.5</sub>	particulate matter with an aerodynamic diameter of 2.5 microns or less
PoO	Plan of Operations
ppm	parts per million
PPH	preliminary priority habitat
PGH	preliminary general habitat

PSD	Prevention of Significant Deterioration
RCG	Rodeo Creek Gold
RCRA	Resource Conservation and Recovery Act
REMSAD	Regional Modeling System for Aerosols and Deposition
RFFA	reasonably foreseeable future actions
RMP	Resource Management Plan
ROD	Record of Decision
ROW	right-of-way
RV	recreational vehicle
s.u.	standard unit
SARA	Superfund Amendments and Reauthorization Act
SH	State Highway
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO <sub>2</sub>	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure
SPL	Sound pressure levels
SR	State Road
SRA	South Fork State Recreation Area
SRK	SRK Consulting (U.S.), Inc.
SRMA	Special Recreation Management Area
SWCA	SWCA Environmental Consultants
SWPPP	Storm Water Pollution Prevention Plan
TCP	traditional cultural property
TD1	Tailings Disposal Facility No. 1
TD2	Tailings Disposal Facility No. 2
TDS	Total Dissolved Solids
tpd	tons per day
tpy	tons per year
TRV	toxicity reference values
U.S.	United States
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USDI	United States Department of the Interior
USDOT	United States Department of Transportation

USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
vpd	vehicles per day
VRM	Visual Resource Management
WPCP	Water Pollution Control Permit
WRDF	Waste Rock Disposal Facility
WSA	Wilderness Study Area

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