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Bureau of Land Management**



and

**Office of Surface Mining Reclamation
and Enforcement**

Preliminary Environmental Assessment

DOI-BLM-CO-S010-2019-0003-EA

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**Dunn Ranch Area Lease-By-Application and Mine Plan
Modification**

***Location:* King II Mine, La Plata County, Colorado**

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CHAPTER 1 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION AND BACKGROUND

GCC Energy, LLC (GCCE), a subsidiary of Grupo Cementos de Chihuahua (GCC), operates the King II Mine, an underground coal mine located in La Plata County (LPC) in southwestern Colorado (**Figure 1-1**) approximately 6 miles west southwest of Hesperus, Colorado and about 14 miles west of Durango, Colorado.

The King II Mine is a room-and-pillar coal mine utilizing the continuous mining method to mine federal coal from federal coal lease COC-62920. The coal from the King II Mine is primarily used as an energy source for GCC-owned cement plants located in Colorado, New Mexico, Arizona, Texas, and Mexico.

On January 10, 2018, GCCE submitted a Lease by Application (LBA) for a proposed new federal coal lease, COC-78825, to the Bureau of Land Management (BLM) Colorado State Office, pursuant to regulations at 43 C.F.R. § 3425. The proposed new lease would contain approximately 2,462 acres located adjacent to and immediately northwest of the King II Mine and existing federal coal lease COC-62920 (**Figure 1-2**). The proposed lease area consists of federal coal beneath surface estate predominantly owned by the Ute Mountain Ute (UMU) Tribe, along with a smaller amount of other private surface owners and BLM-administered surface estate. GCCE proposes to access the federal coal reserve within the proposed LBA area from the King II Mine using underground mining methods from the King II Mine. About 204 acres of non-federal coal would be mined beneath about 479 acres of UMU Tribe owned surface during development of access into the new federal coal reserve.

The National Environmental Policy Act (NEPA) of 1969 requires federal agencies to make informed decisions that consider potential environmental impacts of proposed actions and to engage the public in the review of the environmental analysis prior to finalizing the decision. This environmental assessment (EA) has been jointly prepared by the BLM Tres Rios Field Office (TRFO) and OSMRE, Western Region Office to fulfill the requirements of NEPA. The EA analyzes the potential effects on the human and natural environment of: 1) issuing a new federal coal lease for the proposed Dunn Ranch Area LBA; and 2) the proposed modification to GCCE's approved mining plan for underground mining in the new proposed federal lease, in the event that GCCE is issued the lease. If OSMRE and/or BLM determine that this project would have significant effects following the analysis in the EA, then an Environmental Impact Statement (EIS) would be prepared for the project. If the potential effects are not determined to be "significant", a "Finding of No Significant Impact" (FONSI) statement would document the reason(s) why implementation of the selected alternative would not result in significant environmental effects.

Three EAs have recently been completed for the King II Mine that provide relevant information and analysis for this EA (**Table 1-1**).

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Table 1-1. Recently Completed EAs for the King II Mine

Agency	EA Number	Proposed Action(s)	Issuance Date of FONSI and Decision Record
BLM	DOI-BLM-CO-S010-2014-0025-EA	Coal Exploration License COC-76563 for 23 exploration holes (18 exploration holes within the LBA area)	September 13, 2016
BLM and OSMRE	DOI-BLM-CO-S010-2011-0074-EA	Coal Lease Modification, Mining Plan Modification and Permit Renewal for the King II Mine	BLM – December 15, 2017 OSMRE – January 4, 2018
BLM	DOI-BLM-CO-S010-2014-0025-EA	Amendment to Coal Exploration License COC-76563 for 11 additional exploration holes	May 15, 2018

The TRFO prepared EA number DOI-BLM-CO-S010-2014-0025 (**Table 1-1**) to analyze the potential impacts of an exploration program for the LBA area. Because the area analyzed in the exploration license application EA covers most of the proposed LBA area; shares drainage areas, the same environmental resources, and physical environment with the proposed LBA area; and that EA described and analyzed the effects of approximately 5.3 acres of surface disturbance, similar in scale to what would occur within the proposed LBA area, the Exploration License EA is incorporated by reference in this EA (available at https://eplanning.blm.gov/epl-front-office/eplanning/nepa/nepa_register.do).

DOI-BLM-CO-S010-2011-0074-EA analyzed: 1) the potential effects of a proposed lease modification by GCCE to add approximately 950.6 acres to existing federal coal lease COC-62920; 2) the potential effects of a proposed revision to GCCE’s existing, OSMRE-approved mine permit CO-0106A for proposed mining in the lease modification parcels; and 3) the effects of OSMRE approval of a five-year renewal of that mine permit. Three of the four parcels comprising the lease modification on the north, east, and south portions of the mine permit boundary share portions of their borders with the proposed LBA being analyzed in this EA (BLM and OSMRE 2017). Because the area analyzed in the lease modification EA is immediately adjacent to the proposed LBA area; shares drainage areas, the same environmental resources and physical environment with the proposed LBA; and that EA described and analyzed the effects of the same mining methods to be utilized in the proposed LBA, the lease modification EA (BLM and OSMRE 2017) is incorporated by reference in this EA (available at: <https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId=70895>).

This EA tiers to and also incorporates by reference the Final EIS for the Final San Juan National Forest and Proposed TRFO Land and Resource Management Plan (RMP) (September 2013) (BLM and USFS 2013) and the TRFO RMP and Record of Decision (BLM 2015). These documents analyzed the general effects of coal leasing for the public lands within the TRFO.

The King II Mine currently consists of approximately 26 acres of surface facilities on state-leased lands and approximately 830 acres of underground disturbance. The operation is located in Section 36, Township 35 North, Range 12 West, New Mexico Principal Meridian (NMPM) on CR 120 approximately 7 miles west

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of Colorado State Highway (SH) 140 (**Figure 1-1**). The coal is transported by truck via La Plata County Road (CR) 120 (under LPC Class II Land Use Permit #2012-0089) and Colorado SH 140 primarily to a railhead in Gallup, New Mexico, and directly to GCC owned cement facilities in New Mexico and Arizona, as well as to other small volume markets in the southwestern Colorado area. Section 1.2, Background in the 2017 EA (BLM and OSMRE 2017) provides additional background information.

Most of the lands encompassed by the mine, including the existing federal lease COC-62920, as well as the proposed LBA area, are split-estate lands where the federal government has retained ownership of the subsurface coal (and other minerals) but has disposed of the surface estate (**Figure 1-3**). The UMU Tribe acquired much of the split-estate surface in this area, with other entities owning a smaller portion of the surface estate. The lands acquired by the UMU Tribe are not part of the Ute Mountain Ute Tribe Reservation. In addition, a small portion of the lands in the existing mine permit area and the LBA are both privately owned surface and mineral estates (**Figure 1-4**).

On January 10, 2018, GCCE submitted an initial LBA to BLM to lease federal coal resources in LPC, Colorado, containing approximately 2,462 acres. In February 2018, GCCE applied to the TRFO to amend Exploration License COC-76563 to add 11 exploration holes to the Exploration Plan to obtain additional information on the coal resources in the LBA. On May 15, 2018, TRFO approved the Exploration License Amendment and GCCE drilled five exploration holes between July and September 2018. The LBA was modified numerous times based on the results of the new exploration drilling during collaboration between BLM and GCCE. The LBA area is located outside but adjacent to the OSMRE permit area of the GCCE King II Mine (**Figure 1-2**).

BLM calculations indicate that there are 9.54 million tons of recoverable federal coal in the proposed LBA area. This includes approximately 1.3 mt of recoverable private coal reserves, and approximately 2.5 mt of recoverable existing reserves still to be mined within the current mine permit area, for a total of 13.4 mt. GCCE estimates that there are an additional 3.6 mt of coal (i.e. inferred based on current geologic information) that may be recoverable in part through using a slightly higher recovery factor than BLM and from blending higher grade coal from the LBA with lower grade coal. For the purposes of determining the total coal to be mined and the life of the mine under the Proposed Action, GCCE is including: 1) the LBA confirmed recoverable federal coal reserves; 2) the confirmed privately owned recoverable coal reserves to be mined while accessing the federal coal; and 3) GCCE's slightly larger estimate of coal that could be minable, beyond BLM's calculations, for a total of approximately 17 mt proposed to be mined. If this 17 mt is mined in a continuous manner, and at the start of mining in the LBA area some of that coal is blended with the remaining coal in the lease modification area to improve coal quality, this would represent approximately 22 years of additional coal production at the GCCE King II Mine. The projected mine life and operating plans of the GCCE King II Mine, if the LBA is leased to GCCE, are anticipated to extend through the year 2043. Without the LBA, GCCE estimates that the mine life would only extend through the year 2022.

1.2 PURPOSE AND NEED

CEQ regulations at 40 CFR §1502.13 specify the requirements for the purpose and need statement.

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1.2.1 Purpose

The purpose of the federal action is established by the Mineral Leasing Act of 1920 (MLA) (as amended), which requires BLM to respond to GCCE's lease application for federal coal reserves contained in the LBA and, if appropriate, offer the lands for competitive leasing. Leasing the lands is a necessary first step before mining federal coal resources can be authorized.

The purpose of the federal action is further established by the MLA, which, in the case that GCCE is awarded the competitive lease by BLM, also requires the approval of GCCE's proposed mining plan modification for the lease by the Assistant Secretary, Land and Minerals (ASLM), before GCCE may conduct underground mining and reclamation operations within the new lease.

Additionally, OSMRE is the regulatory authority that administers Federal Mine Permit CO-0106C, which covers the permitted land owned by the UMU Tribe. As the regulatory authority, OSMRE must evaluate the environmental effects resulting from a permit revision for the King II Federal Permit CO-0106C.

The purpose of GCCE's Proposed Action is to allow the applicant access to and mining of federal coal reserves, and for the efficient and economic recovery of the coal resource. This Proposed Action would allow for a logical progression of sequenced mining to recover the federal coal resource.

1.2.2 Need

The need for the federal action is established by BLM's responsibility under the MLA, as amended by the Federal Coal Leasing Amendments Act of 1976, and the Federal Land Policy Management Act of 1976 (FLPMA), which states that public lands shall be managed in a manner that recognizes the nation's need for domestic sources of minerals (43 United States Code [USC] 1701(a) (12)). Furthermore, FLPMA authorizes BLM to manage the use, occupancy, and development of public lands through leases and permits (43 USC 1732). Additionally, the need for the action is to encourage development of domestic coal reserves to meet future energy needs, reducing dependence on foreign sources of energy, and providing for dependable and affordable domestic energy while giving due consideration to the protection of other resource values.

If BLM first decides to offer the lease competitively and it is subsequently issued by BLM to GCCE, the need for this action is also for OSMRE to make a recommendation to the ASLM, and the ASLM to approve, approve with conditions, or disapprove a mining plan modification. Approval would allow GCCE the opportunity to exercise its rights under the new federal coal lease to access and mine the Federal coal reserves.

For GCCE, the need for the Proposed Action is to produce coal to supply the energy source and continue its primary business of cement production both in the United States and in Mexico, as well as to continue supplying specialized markets that are dependent on the King II Mine's coal as an energy source.

1.3 RELATIONSHIP TO STATUTES AND REGULATIONS

The coal mining and related operations proposed by GCCE will be subject to all applicable federal and State statutes, regulations, permits, and policies, and LPC ordinances and GCCE's Conditional Class II Land

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Use Permit (Project #2012-0089). Details on these can be found in Section 1.8 of the Lease Modification EA (BLM and OSMRE 2017).

1.4 DECISIONS TO BE MADE

Based on the information in this EA, the BLM will decide whether to lease the federal coal reserves. The decision may be to:

- Issue a FONSI and Decision Record to lease the federal coal reserves;
- Issue a FONSI and Decision Record to lease the federal coal reserves with special stipulations;
- Issue a FONSI and Decision Record to disapprove leasing the federal coal reserves; or
- Not issue a FONSI and analyze the potential effects of the proposed project in an EIS;

Based on the information in this EA, and if GCCE is issued the federal coal lease, the regulations require the OSMRE to provide a mining plan modification recommendation to the ASLM. To assist with assuring compliance with other federal laws, regulations, and EOs, the OSMRE also reviews other relevant documents before making its recommendation to the ASLM. The ASLM then reviews the Mining Plan Decision Document (MPDD) and decides whether to approve the mining plan modification, and if approved, what, if any, conditions may be needed.

Colorado Division of Reclamation Mining and Safety (CDRMS) normally also has a permitting role under SMCRA to fulfill for approval of mining privately owned coal in Colorado. In this instance, because the area of private coal that would be mined is relatively small and physically separated from the existing State permit area, the State and OSMRE are preparing a Memorandum of Understanding for OSMRE to conduct the permitting for the mining of privately-owned coal in the LBA area under OSMRE's SMCRA permit.

1.5 PLAN CONFORMANCE

The action alternatives are in conformance with the TRFO RMP and Record of Decision (ROD) (BLM 2015). The Approved RMP ROD states that: "...all TRFO lands made available for lease are subject to standard lease terms, which require operators of leases, as well as leasable mineral permits and licenses, to minimize adverse impacts to air, water, land, visual, cultural, and biological resources. Special lease stipulations are applied to a lease if additional restrictions on the rights of lessees are required to protect environmental resources." This EA addresses site-specific resource conditions and impacts that are not covered within the RMP and would be used to justify special stipulations for the new coal lease, if it is issued. Other than BLM land use planning, no other federal land use plans apply to the Proposed Action, Action Alternative and No Action Alternative presented in Chapter 2.

The State of Colorado does not maintain planning documents, nor does it conduct planning processes relating to the alternatives. However, the alternatives would be consistent with the Colorado legislative assembly's declarations regarding the contributions of coal mining operations and to ensure the restoration of any affected lands designated for agricultural purposes.

The action alternatives are also in conformance with the LPC Comprehensive Plan (2017) Goal 8.2 for solid minerals: "Promote responsible mineral development while minimizing potential impacts to the

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environment and local residents.”, and the associated objectives and policies. The surface facilities, mine operations and the use of county roads for coal transport, are regulated by LPC Land Use Code [LPCLUC] Sec. 82-76, 82-161). Colorado statutes such as the *County Planning Code* (CRS § 30-28-101 *et seq.*) and the *Local Government Land Use Control Enabling Act* (CRS § 29-20-101 *et seq.*) independently authorize LPC to permit the land use, including and truck hauling operations on CR 120 for the King II Mine. The LPCLUC includes standards for compatible development that are applied to the facilities and operations for the mine. In addition, LPC maintains county road standards based on road characteristics and traffic levels that determine the requirements for road maintenance and traffic levels on county roads used by GCCE.

1.6 SCOPE OF ANALYSIS

The scope of analysis described in this EA is based on the issues discussed in **Section 1.9, Table 1-3**. The scope focuses on the LBA parcel area, the area within the existing OSMRE Permit area that would provide underground access to the new lease, and private coal reserves that would be also mined under the proposed mining plan for the new lease. Collectively these areas are referred to as the project area (the Project). Areas outside of the LBA are discussed as impacts would potentially occur there. Such areas include nearby residential developments, areas of private coal outside the LBA where subsidence may occur and GCC-owned facilities where coal is delivered.

1.7 CONSULTATION AND COORDINATION

The BLM and OSMRE are Joint Lead Agencies in the preparation of this EA and are both recognized as having jurisdiction by law. LPC and the Colorado Department of Natural Resources (CDNR) are cooperating agencies for this EA based on their special expertise and jurisdiction. LPC’s role is as a reviewing agency for the EA and to ensure conformance of the EA with LPC ordinances and GCCE’s Conditional Class II Land Use Permit (Project #2012-0089). CDNR’s role is as a reviewing agency for the EA and to ensure conformance of the proposed mining operation with the applicable Colorado Laws, regulations and policies governing coal mining.

1.8 SCOPING AND ISSUES

1.8.1 Internal Scoping

An interdisciplinary team, including OSMRE and BLM, formulated issues associated with the Proposed Action as a result of public scoping and tribal consultation and subsequent internal discussions, conference calls, and meetings.

1.8.2 Public Scoping

The public scoping period began on February 8, 2019 and finished on March 11, 2019. A public notice was posted on the BLM’s national NEPA Register, on OSMRE’s website and in the Durango Herald on February 11, 13, and 15, 2019. In addition, a public scoping letter was sent to 289 entities (comprised of individuals, organizations, businesses, and government agencies) and 26 Indian tribes with information about the Proposed Action and a request for comments within the 30-day public comment period. A total of 13,050 comments were received during the scoping period. Many comments were submitted two or three times, each to the different agency comment addresses, and the submittals to each address were counted in the

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total as individual comments. Of the total number, 13,012 were form letters or form emails with the same content, and 38 submittals included unique comments. A total of seven general issues were identified during scoping and are listed in **Table 1-2**. Issues that were not analyzed in detail (and the rationale for dismissing them for further analysis) are described in **Section 3.3** and issues carried forward for detailed analysis in this EA are identified in **Section 3.4**.

Table 1-2. Issues Identified During Scoping

Issue	Issue Statement
1	Concerns related to potential air and water pollution impacts.
2	Concerns related to potential impacts on traffic conditions.
3	Concern related to NEPA adequacy and specifically, that an EIS should be completed.
4	Concerns related to climate change impacts.
5	Concerns related to potential impacts on wildlife and threatened and endangered species.
6	Concerns that alternatives to the Project should include use of renewable resources.
7	Concerns that a single EA is being used to satisfy the NEPA requirements of both agencies.

1.8.3 Issues

Table 1-3 describes the issues identified by public and internal agency scoping that are analyzed in detail in this EA.

Table 1-3. Issues Addressed in this EA

Issue	Resource	Issue Statement
1	Air Quality/Climate Change	What would be the effects of the alternatives on local, regional, and global air quality and global climate change?
2	Water Quality and Quantity	What would be the effects of the alternatives on groundwater and surface water quality and quantity in the local area, and on nearby domestic/residential water wells?
3	Cultural Resources	What would be the effects of the alternatives on cultural resources and on UMU Tribal Assets?
4	Noise	What would be the effects of the alternatives on noise/vibration levels at residences in the Vista de Oro Subdivision as well as at residences along the truck haul route?
5	Wetlands and Waters of the U.S. (WOTUS)	What would be the effects of the alternatives on wetlands and WOTUS?
6	Subsidence	What would be the subsidence effects of the alternatives on natural resources and land uses within the LBA and on the structural integrity of nearby residences and other structures?
7	Land Use	What would be the effects of the alternatives on other land uses within and adjacent to the LBA and the mine?

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CHAPTER 2 PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This chapter provides a description of the Proposed Action, which includes the LBA and GCCE's conceptual mine plan for the LBA. This Chapter also describes the No Action Alternative and alternatives that were considered and eliminated from detailed analysis in accordance with 40 CFR §1502.14.

2.2 ALTERNATIVE A - PROPOSED ACTION

2.2.1 Overview

GCCE has filed an application for a federal coal lease. with the BLM Colorado State Office for its King II Mine in the Dunn Ranch Area located in LPC, Colorado (**Figure 1-1**). The proposed new lease would encompass approximately 2,462 acres adjacent to the northern boundary of GCCE's existing federal coal lease COC-62920 (**Figure 1-2**).

The current federal and fee leases and OSMRE permit area of the King II Mine are accessed from the portals and underground workings constructed on the State of Colorado lease located north of the Ute Line in Section 36 of T35N, R12W NPPM. All surface facilities required for the proposed Project would be the same facilities as those currently located on the State land and have been permitted under CDRMS permit number #C-1981-035. However, for any temporary surface disturbance on privately owned land, LPC has jurisdiction over such surface disturbances. If GCCE is successful in acquiring the new federal lease, it would mine the coal using the continuous mining method currently used in the King II Mine and described in this EA. OSMRE is the regulatory authority that administers Federal Permit CO-0106C, which covers the surface effects of the underground mining area on the federal lease and surface disturbance on land owned by the UMU Tribe. The underground operations are regulated by the Mine Safety and Health Administration (MSHA). The MSHA Number for the King II Mine is MSHA ID# 05-04864.

The lands of interest are contained entirely within LPC, Colorado, and are described as follows:

New Mexico Principle Meridian, Colorado

T. 35 N., R. 11 W.,

sec. 18, lots 2 thru 5, 8, 9, and 10, SE1/4NW1/4, and NE1/4SW1/4;

sec. 19, lots 1, 2, 6, and 7, NE1/4NW1/4, and N1/2SE1/4NW1/4.

T. 35 N., R. 12 W.,

sec. 13, S1/2NE1/4, SE1/4NW1/4, S1/2SW1/4, NE1/4SE1/4, and S1/2SE1/4;

sec. 14, S1/2NE1/4SW1/4, S1/2NW1/4SW1/4, S1/2SW1/4, S1/2NW1/4SE1/4, and S1/2SE1/4;

sec. 15, SE1/4SW1/4 and S1/2SE1/4;

sec. 22, N1/2NE1/4, N1/2SW1/4NE1/4, SE1/4SW1/4NE1/4, SE1/4NE1/4, E1/2NE1/4NW1/4, NE1/4SE1/4NW1/4, and E1/2NW1/4SE1/4;

sec. 23, N1/2NE1/4, SE1/4NE1/4, N1/2NW1/4, SE1/4SW1/4, and SE1/4;

sec. 24, N1/2, SW1/4 and NW1/4SE1/4;

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sec. 26, N1/2NE1/4NE1/4, SW1/4NE1/4NE1/4, NW1/4NE1/4, N1/2NW1/4, N1/2SW1/4NW1/4, SE1/4SW1/4NW1/4, and SE1/4NW1/4;
sec. 27, NE1/4NE1/4 and SE1/4NW1/4NE1/4.

The area described contains 2,462.07 acres.

2.2.2 Access to the LBA

Coal in the LBA area would be accessed from the West Mains (an underground main haulage road) of the King II Mine through a subsurface, low-cover crossing located within the existing OSMRE permit area beneath UMU Tribe acquired lands. The existing King II Mine and the LBA coal reserve area are separated by East Alkali Gulch (the Gulch) where most of the coal outcrops occur. At the southwestern end of the OSMRE Permit area and the western end of the existing West Mains, the coal outcrops just below the valley surface beneath the alluvium and this is where the low-cover crossing would be constructed (**Figure 2-1**). Access for construction of the low-cover crossing would be located on existing improved and unimproved gravel roads starting at State Highway 120 on State lands approximately three quarters of a mile east of the existing surface facilities (**Figure 2-1**). The route would follow existing roads and no road improvements would be needed such as widening or other surface disturbance outside the existing disturbance anywhere along the entire construction access route. Grading of the route within the existing road disturbance may be required in some specific areas to allow safe passage of construction vehicles.

The low-cover crossing would have three entryways¹ (an underground horizontal passage used for haulage and ventilation) (**Diagram 2-1**). The low-cover crossing would be constructed starting from the western end of the existing West Mains. The current conveyor system and ventilation system would then be extended into the new workings to the north through the new underground entryways. During construction activities for the entryways, up to 10 acres of land surface in the Gulch could be temporarily disturbed and then reclaimed.

The entryways would be constructed of corrugated steel, multi-plate arches, buried beneath the surface across the Gulch to form what would be analogous to three very large buried half culverts (**Diagram 2-2**).

The crossing would consist of three declines (i.e. tunnels angled downward) constructed from the existing workings on the eastern side of the Gulch down to an elevation of 7,425 feet (ft) at the edge of the valley floor, close to the contact between the valley alluvium and bedrock (**Diagram 2-3**).

¹ MSHA may require GCCE to construct four entryways rather than the three proposed and shown on the diagrams. **Diagram 2-1** depicts a preliminary engineering design for analysis purposes and will be refined when the final engineering design would be prepared and approved by MSHA and OSMRE. All proposed surface disturbance for the construction of four entryways would occur within the same maximum 10-acre footprint as for the three proposed entryways.

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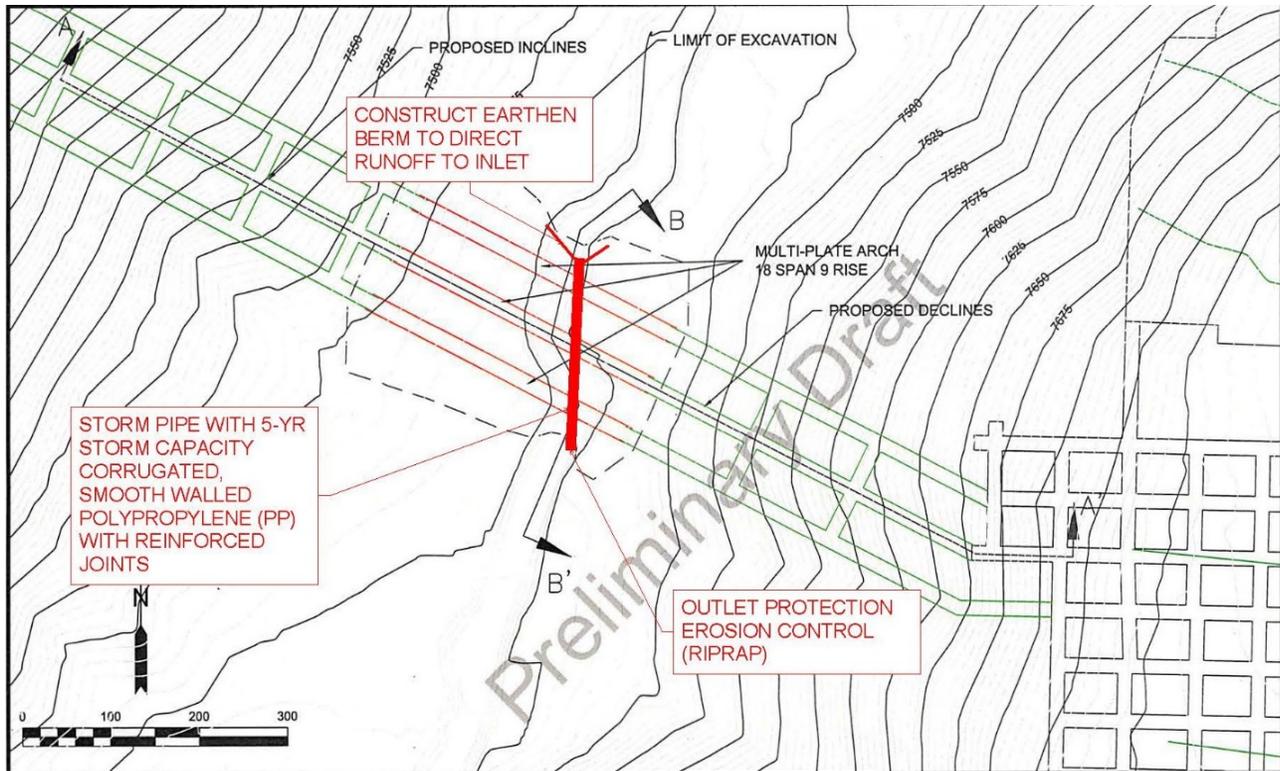
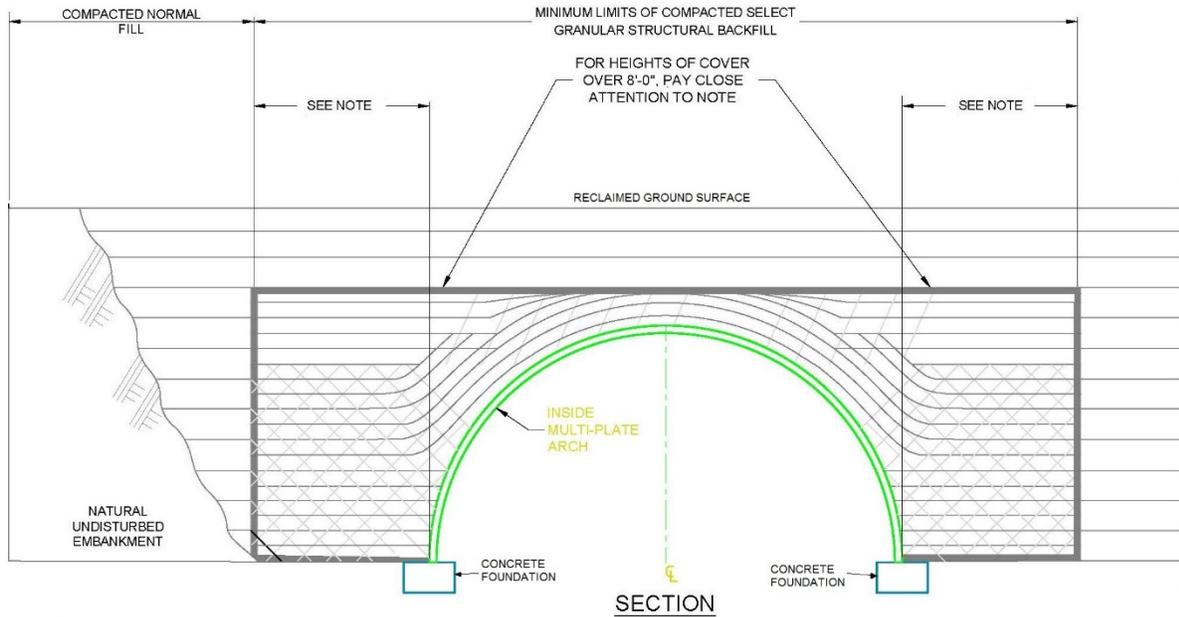


Diagram 2-1. Map View of the Proposed Subsurface Low-Cover Crossing

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NOTE: TRENCH WIDTH AND/OR SELECT FILL ENVELOPE WIDTH SHALL BE BY DIRECTION OF THE ENGINEER OF RECORD. A TYPICAL WIDTH OF 4 FEET IS DEPICTED, BUT GREATER OR LESSER DISTANCE MAY BE REQUIRED DEPENDING UPON SITE-SPECIFIC CONDITIONS. THIS WIDTH DEPENDS ON FACTORS SUCH AS THE LATERAL PRESSURES EXERTED BY THE STRUCTURE ONTO THE ADJACENT SOIL FOR THE GIVEN LOADING CONDITIONS, THE STRUCTURE SHAPE, THE QUALITY OF THE SELECT FILL MATERIAL AND THE STRENGTH OF THE IN SITU EMBANKMENT/TRENCH MATERIAL. THESE FACTORS MUST BE EVALUATED BY THE PROJECT ENGINEER FOR EACH SPECIFIC SITUATION.

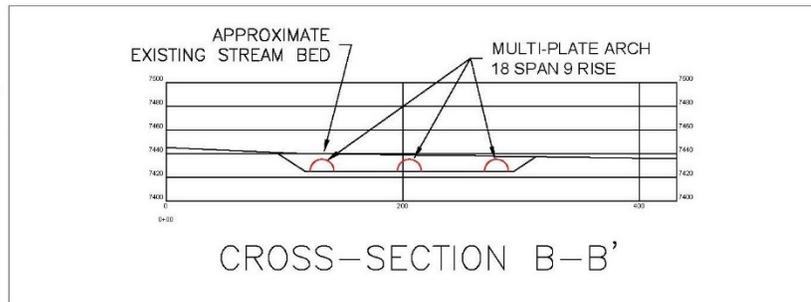


Diagram 2-2. Cross Section View Perpendicular to the Proposed Subsurface Low-Cover Crossing Entries

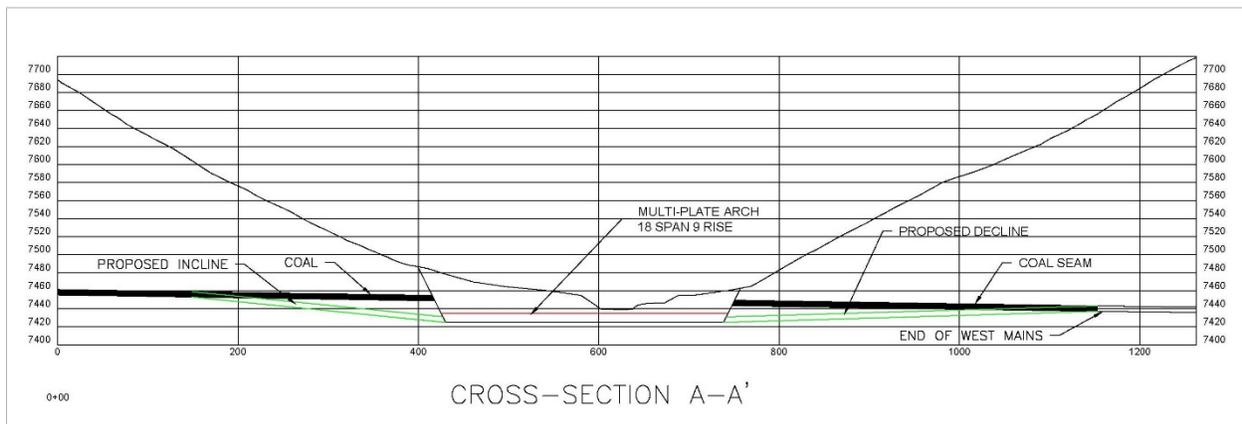


Diagram 2-3. Cross Section View Parallel to the Proposed Subsurface Low-Cover Crossing Entries

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Topsoil would first be stripped over the new low-cover crossing area and stored in a topsoil stockpile for reuse in reclamation (**Diagram 2-4**). Sequentially, a trench for each entry about 40 ft deep and about 40 ft wide would then be excavated across the valley floor and would also expose competent bedrock on both ends. Excavated material from the first trench would be stored in a pile separate from the topsoil and would be used in backfilling the last trench. An estimated 65,000 cubic yards (CY) of dirt would be excavated in total to construct the tunnels. The excavation would be phased to keep excavated stockpiles at a reasonable size. An estimated area of 43,560 square feet is available to stockpile material (**Diagram 2-4**), which assuming a 10-ft average depth represents a temporary storage for 16,000 CY of material. Therefore, the Project would require at least 4 phases of excavation.

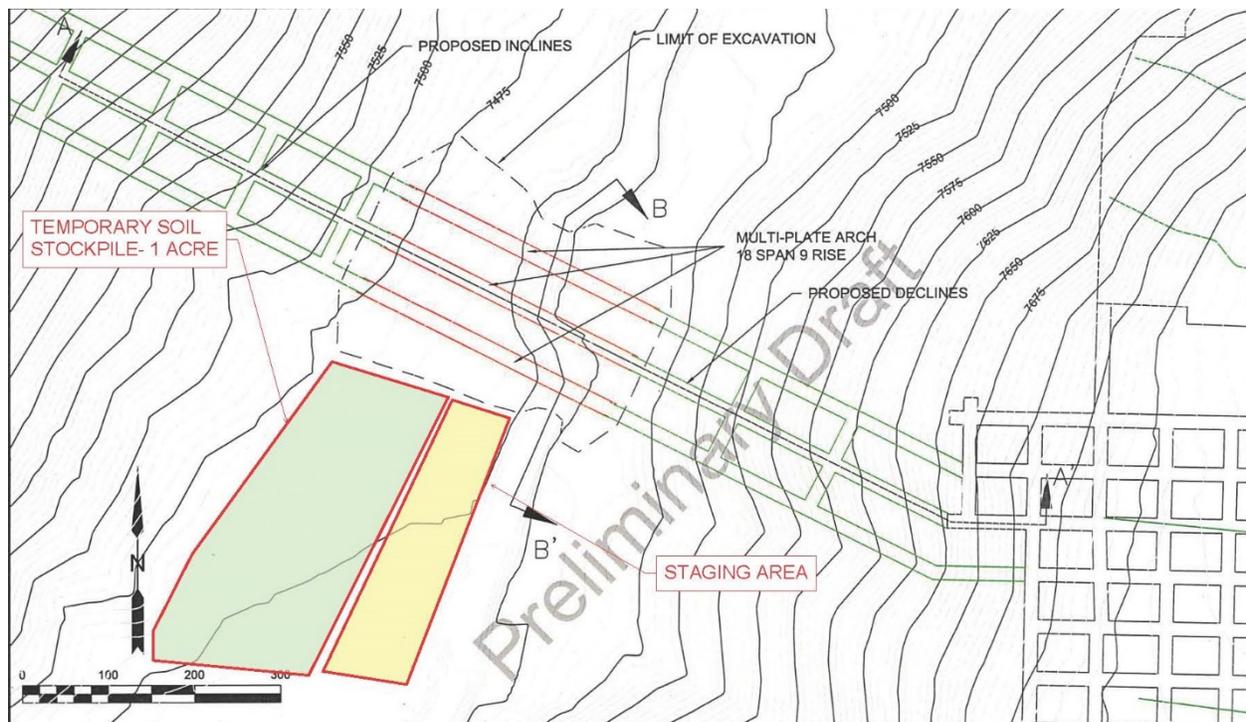


Diagram 2-4. Map View of the Staging and Stockpile Areas

At each phase, the area would be excavated to subgrade, arched culverts installed, and the culverts backfilled before beginning the next phase. Once each trench is excavated, concrete would be transported to the site and foundation footers for the multi-plate arches would be installed. After foundation construction, a multi-plate corrugated steel arch, 18 ft wide and 9 ft tall, would be constructed. The arches would be extended into the bedrock at each end approximately two to three ft and then sealed using shotcrete. Once each arch is constructed, the trench would be backfilled using material excavated from the next sequential trench, the arches would be covered with excavated material, and compacted.

When excavating in the channel bottom, the contractor would install a reinforced HDPE rigid pipe sized for the 5-year storm water runoff event with a compacted berm constructed on the upstream side to funnel the channel towards the pipe inlet above the excavation. The pipe would be moved to one side of the channel during initial excavation, and then relocated to other side once this work is complete and

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backfilled. Outlet protection erosion control would be installed at the pipe outlets in both locations. The diversion would remain until the backfilled channel could be re-established with appropriate erosion protection. Due to the limited size of the channel bottom (20-ft wide), the diversion should remain in place for less than a month.

Topsoil would then be spread over the disturbed area up to the original soil depth and surface elevation, and the stream bed would be re-established as closely as possible to its original configuration. The re-established stream would be lined with HDPE liner to limit water infiltration, and the liner would be covered with a bedding layer overlain with riprap to prevent erosion of the channel. Construction of the low-cover crossing would take about six months and during construction up to approximately 10 acres would be temporarily disturbed and then reclaimed. The construction of the proposed low-cover crossing would meet the definition of *Development* found in the LPC Land Use Code and would be subject to the appropriate land use review process.

From the ends of the arches on the west side of the Gulch, three inclines (i.e. tunnels angled upwards) would be developed by conventional mining methods up to where they would intersect the coal seam in the new lease area. From that point the coal would be mined utilizing the continuous mining method used in the existing King II Mine.

2.2.3 Reasonably Foreseeable Mine Operations

Coal removal from the Project area would follow the conceptual mine plan shown on **Figure 2-2**.

The type of mining utilized would be the “room and pillar” method followed by retreat mining. Though the thickness of the coal seam typically ranges from five to 10 ft, recoverable coal is restricted by four issues: 1) a minimum coal thickness of five ft; 2) a minimum roof thickness of 100 ft; 3) a maximum in-seam parting (i.e. a layer of rock in a coal seam) of eight inches; and 4) the quality expressed as BTU (British thermal units) value. The coal seam would be mined using continuous mining machinery. After the coal is mined, it would be brought to the existing surface facility via a conveyor and placed into one of two stockpiles where it would be crushed and prepared for transport. During normal underground mining operations, shale and sandstone break away from the roof and floor of the coal seam. This material is removed from the King II Mine, transported less than two miles (3.2 kilometers (km)) away and placed in the existing approved mine waste (refuse) storage area at the King I Coal Mine (**Figure 2-1**). Contents of the refuse pile, located in the vicinity of the closed King I Mine portal, include mine waste from the King I and II mines and is composed of coal, sandstone, siltstone, and carbonaceous shale rock fragments suspended in a sand, silt, and clay matrix (Trautner Geotech, LLC [Trautner], 2015). All mine refuse is contained within a constructed waste bank. Historical drainage in this area has been modified and engineered to facilitate separation between the refuse pile materials and sources of water. The coal mine waste (refuse) volume has increased approximately 5,000 CY per year. As of July 2016, approximately 174,000 CY existed. Anticipated refuse production from 2017 through 2040 is approximately 5,000 CY per year. The waste bank is currently designed to accommodate up to 1,000,000 CY. CDRMS is currently processing a permit revision to modify the waste bank, and the final design would accommodate up to 1,100,000 CY.

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GCCE also expects that, in addition to the approximate 10 acres of land that would be disturbed to construct the low-cover crossing in the Gulch, small additional and scattered surface areas would need to be disturbed over the life of the mine. Examples of such disturbance would typically include, but would not be limited to drilling new groundwater monitoring well clusters, installing new erosion control structures for stormwater, improving access roads, and conducting future exploration drilling within the permit and lease area. However, the specific types, locations and sizes of such disturbances are not known at this time. GCCE estimates these combined potential future activities would disturb about 10 acres over the duration of mining. Therefore cumulatively, this EA analyzes a total surface disturbance of 20 acres for the Proposed Action, including the 10 acres for the low-cover crossing construction in the Gulch and the additional 10 acres for future potential activities that would occur in scattered and currently unknown locations.

The future potential activities described above would be subject to prior CDRMS, OSMRE, BLM or LPC approval and oversight as appropriate and would be handled as technical revisions or minor permit revisions. For any future proposed disturbance areas, the federal agencies would determine if the activities require cultural and biological surveys prior to approval. GCCE would submit an updated Reclamation Plan in anticipation of the possible future surface disturbing activities.

The conceptual mine plan in the Project Area (**Figure 2-2**) follows the topography (and coal seam), which is defined by mesas bounded by deep drainages. Once the inclines are developed into the new lease area, the access mains would be driven to the north-northwest (**Figure 2-2**). Mining of the new lease would progress generally according to the sequence as shown on **Figure 2-2** and in the associated timeframe it would take to mine each area.

Starting at the end of the panel once the room and pillars in each mining panel are complete, the pillars would be removed allowing the roof to collapse. This is typically called retreat mining and would allow for the most efficient extraction of coal.

All the proposed mining areas are shown on **Figure 2-2**.

BLM calculations indicate that there are 9.54 million tons of recoverable federal coal in the proposed LBA area; approximately 1.3 mt of recoverable private coal reserves that would be mined during development of access to the federal coal; and approximately 2.5 mt of recoverable existing federal coal reserves still to be mined within the current mine permit area, for a total of 13.4 mt. Based on the mining sequence shown in **Figure 2-2** during years 1-7 of mining existing federal reserves in the lease modification areas would be blended with reserves mined from the new lease and private reserves to improve overall coal quality. GCCE also believes there are an additional 3.6 mt of privately-owned coal resources that may be recoverable beneath private lands surrounding the new lease that could also potentially be mined when the new lease is mined, for a total of approximately 17 mt proposed to be mined.

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2.2.4 Annual Production and Life of Mine

The planned production rate is a maximum of about 600,000 tons per year (tpy) for the first 2 years and about 800,000 tons per year thereafter. The life of the mine would be extended by about 22 years to 2043 including mining the inferred private reserves. If the annual production rate is lower, the mine life could be extended further. As shown in **Table 2-1**, coal production at the King II Mine increased annually from its inception in 2007 until 2015. Reductions in coal production in 2016 were primarily due to depressed regional coal markets. In 2016, LPC issued GCCE a Class II LUP (Project #2012-0089) that included a Road Improvements Agreement (RIA), which limits the volume of coal truck traffic along CR 120 based upon various phases of road improvements that GCCE agreed to complete as part of their LUP. The LUP, RIA, and LPC Planning Department staff report are publicly available on the LPC Planning Department GCCE Project web page at: http://lpcdds.org/planning/gcc_energy_project. Prior to the RIA and LUP, actual annual production was driven by coal and alternative fuel markets.

Coal production at the King II Mine is currently limited by the number of allowable loaded coal trucks on CR 120 per the LPC RIA. The RIA allows an average of 80 loaded trucks per day through road improvement Phases 1, 2, and 3; 100 trucks per day during Phase 4, and 120 trucks per day after Phase 5 improvements are completed. Based on each loaded truck carrying approximately 28.5 tons, the maximum allowed annual production after Phase 5 RIA improvements is approximately 1,067,040 tons per year. The average daily number of truck trips on CR 120 for loaded and unloaded coal trucks as well as suppliers related to the King II Mine is also included in **Table 2-1**.

Table 2-1. King II Mine Coal Production and Truck Trips

Year	Coal Production (Tons)	Average Daily Truck Trips	Mine Employees ¹
2007	7,433	1.5 Loaded/3 Total (5 months)	7
2008	155,655	14 Loaded/28 Total	31
2009	504,231	48 Loaded/96 Total	63
2010	523,413	50 Loaded/100 Total	88
2011	618,132	59 Loaded/118 Total	85
2012	639,003	61 Loaded/122 Total	106
2013	737,131	71 Loaded/142 Total	133
2014	970,790	93 Loaded/186 Total	139
2015	813,677	78 Loaded/156 Total	121
2016	628,953	70 Loaded/140 Total ²	89
2017	543,357	65 Loaded/130 total	82
2018	615,947	70 Loaded/ 140 Total	83
Average	563,000	113	86

Source: GCCE.

¹ Number includes employees working at both King Mine I and King Mine II.

² Truck trips limited to six days per week by LPC RIA.

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From year to year, actual coal production would be based on several assumptions, foremost, that coal markets are favorable and that GCCE has buyers. Another factor potentially affecting production levels would be the consistency of coal quality present within the new lease.

Workforce - As of December 7, 2017, there were approximately 66 hourly employees, 12 hourly contractors, and 14 salaried employees working at the King II Mine.

Relationship to Existing Mining Operations and Facilities - The unleased federal coal reserves comprise an approximate 2,462-acre block of coal north of the northern limits of GCCE's existing King II Mine (**Figure 1-2**). In addition, about 204 acres of non-federal coal would be mined beneath about 479 acres of UMU surface. Surface effects on approximately 366 acres of UMU Tribe owned surface above federal coal in the LBA and above three isolated private surface areas would be regulated by OSMRE under a memorandum of understanding with the CDRMS. **Section 2.2.3** above provides additional details of the relationship of the Proposed Action to the existing mining operations and facilities.

Intended Use of the Coal - The coal from the King II Mine is favored for its high heating value (12,300 BTU per pound) and its low sulfur, ash, and alkali content. It is sold off-site in the southwest U.S. and Mexico and used in the manufacturing of Portland cement in coal-fired cement kilns. There are also small volume sales to regional steam-powered railroads and to a local concessionaire for home heating.

A production rate of 629,785 tpy represents the current annual average, 67 percent (421,000 tpy) of which is delivered to GCC -owned cement plants in the U.S. and Mexico where the coal is used as a fuel source in the cement manufacturing process. These plants are in Pueblo, Colorado (105,000 tpy), Tijeras, New Mexico (76,000 tpy), and in Chihuahua and Samalayuca, Mexico (240,000 tpy). Deliveries to the cement plants in the U.S. are directly trucked from the King II mine. Coal delivered to GCC's Mexico cement plants are delivered via rail from the Gallup, New Mexico rail hub. An additional approximately 12,000 tpy are delivered to the Durango & Silverton Narrow Gauge Railroad (3,600 tpy), the Cumbres and Toltec Scenic Railroad in Chama, New Mexico (1,500 tpy), and locally (7,000 tpy) for home heating. The coal haul routes are shown on **Figure 1-1**. On average, approximately 448,785 tpy (including the GCC Mexico cement plant volumes) is transported by truck to the rail terminal in Gallup, New Mexico for delivery to GCC plants in Mexico and to variable cement plant buyers in the Southwest (depending on highly variable markets, alternative fuels, and coal supply).

2.2.5 Design Features

The Project design features are measures committed to by GCCE to reduce potential environmental impacts and are incorporated into the Proposed Action. The design features are described in **Appendix B**. Additional design features are described in the Mine Plan for the King II Mine.

2.3 ALTERNATIVE B – NO ACTION

Under the No Action Alternative, the LBA would not be offered for competitive lease sale by BLM, there would be no mining plan modification to be considered for approval by the ASLM, and federal coal reserves in the LBA and new private reserves would not be recovered. GCCE would continue mining within the existing federal and state mine permit areas until those coal reserves are mined out. At the current

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mining rate, mining would cease by approximately 2022. The mine would be shut down and reclamation operations would begin and continue until completed in accordance with GCCE's approved federal and state permits and reclamation plans. Under the No Action Alternative, there would be no surface disturbance, removal of coal, air quality impacts, or any other effects associated with the Proposed Action.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

This section describes alternatives to the Proposed Action for the Project that will not be fully analyzed in detail because they did not meet the criteria listed in 40 CFR § 1502.14.

2.4.1 Northern Mine Area Underground Access Alternative

This alternative access to the LBA was considered to extend the mine to the northwest from the existing northern most portion of the current mine workings to access the northeastern portion of the LBA coal reserve by tunneling under the Gulch. However, exploration drilling has shown that this area is primarily comprised of sandstone. Mining in sandstone creates silica dust which poses a hazard to miners' respiratory health in the form of silicosis. In addition, mining through the sandstone would require the use of blasting techniques which would create additional new safety hazards for the miners to which they currently are not subject. Lastly, blasting would also cause additional noise and vibration effects to public health and safety not associated with the Proposed Action.

This alternative would extend mining operations much further from the portal than the Proposed Action, which would result in substantially increased costs for additional ventilation, conveyor belts, conveyor drives, electrical stations, and cable, as well as require extensive inspections, and maintenance of extensive existing mine workings. Additionally, requirements for new personnel trained in blasting as well as new licenses for the use of explosives would substantially increase costs. Lastly, the sandstone mined would be of no economic value with no financial return on the mining required, and the mined sandstone would need to be hauled to the King I Mine refuse pile at additional cost. The aggregate of these additional and increased costs would make this alternative economically infeasible, combined with the greater adverse impacts than the Proposed Action, this alternative was eliminated from further consideration. Therefore, this alternative would have greater environmental impacts than the Proposed Action and is eliminated from further consideration.

2.4.2 Northern Mine Area Surface Access Alternative

This alternative access to the LBA considered joining the existing mining operations to the LBA across the Gulch in a location and orientation like the alternative considered above (**Section 2.4.1**) but, in this case, the access would be developed on the surface. The access would start at the farthest north area of the mine, then run northwest across the upper reach of the Gulch to access the LBA area near its most eastern boundary. In this location the coal seam is approximately 85 ft above the canyon floor. To cross the canyon in this area, GCCE would either need to build a bridge about 85 ft in height, approximately 1,000 ft long, and rated for a 60-ton weight limit or construct steep switch back roads on both sides of the canyon. In addition, for either sub-option this alternative would require constructing an enclosed conveyor belt system across the Gulch to bring mined coal out of the LBA Area and to the existing mine surface facilities, as well as new portals on each side of the Gulch, a new mine ventilation system for the LBA area, and new

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surface electrical facilities. For this alternative, any new surface disturbance outside of the current 26-acre site at King II would require a new LPC land use permit adding costs and time to the Project.

For the bridge sub-option, the cost of the engineering design alone for this type of complex bridge would be prohibitively high. In fact, it is estimated that the engineering design cost alone would exceed the expected budget for construction of this sub-option. The design cost would be in addition to the bridge construction costs, as well as the costs of the other required new surface structures and facilities described above, as well as structure and road maintenance. In addition, the size and weight of the equipment that would cross such a bridge would be too hazardous to consider this option further, especially in view of the frequent inclement weather conditions, especially snow and ice, to which driving across the bridge would be subject. The combination of the additional and increased costs would make the bridge sub-option for this alternative economically infeasible, and therefore it was eliminated from further consideration.

Likewise, constructing and utilizing steep switch back roads on both sides of the Gulch would also pose significant hazards to heavy equipment and drivers due to the grade of the roads. As with the bridge sub-option, severe weather events, especially in the winter, would heighten the level of hazard probability. The road would need to be maintained all year round, and during weather events the road would have to be maintained at all hours of operation for safety. Accidents on the bridge or roads would result in delays in moving supplies and workers between the existing mine and the Project Area that would increase operating costs and could pose a threat to worker safety.

The overall cost of the switchback road sub-option is also significant due to the combined costs of construction, maintenance, and permitting. The road would require many annual labor hours and special equipment to maintain the road surface and drainages, pull equipment up the grades, plow snow, and mitigate dust. Also, the cost and time of gaining LPC permits to allow for the road to be constructed would substantially increase overall costs and delays to the Project. Considering the combined costs of the switchback road option, along with the costs of a new enclosed conveyor belt system, two new mine portals, and a new ventilation system, this alternative would be economically infeasible.

From an environmental effect standpoint, the switchback road sub-option would present additional substantial adverse environmental effects when compared to the Proposed Action. Constructing the two new mine portals and the switchback roads would require large cuts and fills on both sides of the Gulch. Both the switchback roads and a road across the bottom of the Gulch would result in long term surface disturbance. The amount of surface impact for the switchback road sub-option is estimated to be 50 percent larger than the disturbance would be for the Proposed Action, and the impacts would be long term rather than temporary as they would be under the Proposed Action. Further, the switchback roads would be highly visible features, affecting the visual resources of the area. Lastly, the noise of equipment traffic operating frequently on the roads in the Gulch would be an adverse effect not presented by the Proposed Action. In addition to being economically infeasible, this alternative would result in substantially greater adverse environmental impacts than the Proposed Action, including greater impacts to miner and public health and safety, and therefore was eliminated from further consideration.

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2.4.3 Central Mine Area Surface Access Alternative

A third alternative LBA access site that was considered was to develop a surface access from the west central part of the existing mine directly north across the Gulch into the LBA. However, in this location the coal seam is located approximately 100 ft above the floor of the Gulch. This alternative would require construction of the same new facilities as described for the alternative above (**Section 2.4.2**). For the same reasons as described for the alternative above (**Section 2.4.2**), in addition to being economically infeasible, this alternative would result in substantially greater adverse environmental impacts than the Proposed Action, including greater impacts to miner and public health and safety, and therefore was eliminated from further consideration.

2.4.4 Southern Mine Area Surface Access Alternative

The fourth LBA access alternative that was considered but eliminated from analysis was construction of a road across the Gulch on the surface at the southwestern end of the OSMRE permit area in the same location as the Proposed Action. The road would be constructed from the existing mine workings to the northwest across the Gulch and into the LBA reserves. This alternative would require construction of new mine portals on both sides of the Gulch, a permanent access road across the Gulch, a new covered conveyor system, a new ventilation system for the mining in the Project Area, and new surface electrical facilities. For this alternative, any new surface disturbance outside of the current 26-acre site at King II would require a new LPC land use permit adding costs and time to the Project.

The area disturbed for this alternative would be greater than for the Proposed Action, and the disturbance would be long term rather than the temporary disturbance for the Proposed Action. The new road and structures constructed would have long term impacts on the visual resources for the area rather than the temporary visual impacts of the Proposed Action. In addition, vehicle traffic crossing the Gulch as well as operation of the new ventilation system would result in noise and vibration impacts on public health and safety not associated with the Proposed Action. Vehicle accidents on the road, a threat heightened during inclement weather, would impact worker safety and could also result in delays in moving supplies and workers between the existing mine and the Project Area that could pose an additional threat to worker safety. This alternative would result in substantially greater adverse environmental impacts than the Proposed Action, including greater impacts to miner and public health and safety, and therefore was eliminated from further consideration.

2.4.5 Smaller Amount of Coal Alternative

This alternative considered but dismissed a smaller overall amount of coal to be mined (e.g., a 10-year supply rather than the estimated 22 years). The rationale for this alternative was to give the federal agencies more flexibility to move away from coal as a fuel source for cement or energy. This alternative was not considered for further analysis as it does not meet the purpose and need as stated in **Section 1.2**. Reducing the amount of coal reserves proposed to be mined would alter the proposed mine plan which may result in the permanent bypass of recoverable federal coal. Upon completion of this EA and when BLM makes its leasing decision, the agency does have the discretion as provided under the applicable regulations to offer a smaller LBA parcel than was applied for by GCCE, if it is within the analysis area for

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this EA. In this case, a separate NEPA analysis would not be needed because the impacts are already analyzed under the Proposed Action.

2.4.6 Mandatory Methane Flaring and/or Capture Alternatives

Methane is a known greenhouse gas and a byproduct of coal mining. This alternative would include methods for flaring or otherwise capturing methane produced at the King II Mine. This alternative was dismissed as the previous Lease Modification EA (BLM and OSMRE 2017) determined that methane concentrations are naturally low in the King II Mine. The highest ever recorded by MSHA at the mine is 0.2 percent due to the area's naturally low occurrence of the gas in the coal formation. Exposure of the coal seam in outcrops at the surface, as well as the thin overburden covering the coal seam has allowed methane gas that was originally contained in the coal to naturally vent to the atmosphere over geologic time. These same conditions characterize the coal in the LBA area. Therefore, no additional methods of methane flaring, or capture are required because they are not technically feasible.

2.4.7 Use of Electric Trucks and Other Electric Machinery Alternative

This alternative was considered to reduce the amount of emissions from operations and transport of the mine's coal. The current emissions from mine operations, including for coal transport, were analyzed in the 2017 Lease Modification EA (BLM and OSMRE 2017) as well as in **Chapter 3** of this EA. The continuous mining machinery used in the mine is powered by electricity. This alternative was not carried forward for analysis because it would not be economically feasible as the use of electric vehicles and machinery would be cost prohibitive for a minimal reduction in air quality emissions. This alternative would be beyond the scope of authority for both the BLM and OSMRE to require the use of machinery that is not specifically required by statute or regulation. Although, it is allowable to analyze alternatives outside an agency's jurisdiction, the alternative was dismissed because it is not economically feasible. The specific analysis of the direct and indirect air impacts related to this Project are in **Section 3.4.1.2**.

2.4.8 Separate NEPA Analyses for the BLM and OSMRE Alternative

This alternative called for separate and sequential NEPA analyses for both BLM's and OSMRE's decisions. This alternative was not carried forward because it would not implement basic policy or CEQ guidance, and therefore would not meet the purpose of and need for the action. CEQ guidance for preparing NEPA documents encourages agencies to combine preparation of NEPA documents whenever possible in an effort to streamline NEPA. Additionally, the agencies will prepare separate Decision Records/FONSIs, if appropriate, at the end of this analysis. Therefore, the decision-making portion of the overall NEPA process would be kept separate. Finally, the impacts would be similar regardless of whether the analyses were conducted separately or together.

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CHAPTER 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

3.1 INTRODUCTION

This chapter describes the existing conditions relevant to the issues presented in **Table 1-3** and discloses the potential direct, indirect, and cumulative impacts of the Proposed Action and No Action Alternative on those issues. Within this section, the terms “effects” and “impacts” are used interchangeably. No additional mitigation measures were identified as being necessary following the analysis of each issue and therefore no discussion of mitigation or residual impacts is provided below. For the purposes of this analysis, potential effects are categorized as direct or indirect, and short term or long term. Short-term impacts generally occur for a short period during a specific point in the mining process. Long-term impacts would generally last the life of the Project and beyond. Finally, impacts are described by their level of significance (i.e., major, moderate, minor, negligible, or no impact). An impact is considered to be major (or significant) if it would result in a substantial change to the environment. An impact is considered moderate or minor if it would not result in a substantial environmental change but could still have some measurable effect. In contrast to no impact, a negligible impact is one that would occur but at the lowest limits of detection of an effect.

In addition to direct and indirect effects, cumulative impacts are also addressed. The cumulative impact analysis is required to evaluate the “impact on the environment which results from the incremental impact of the [Proposed Action] when added to other past, present, and reasonably foreseeable future actions” (40 CFR 1508.7).

The past uses, present uses, and reasonably foreseeable actions analyzed as part of the cumulative effects analysis are identified in **Table 3-1**.

Table 3-1. Past, Present, and Reasonably Foreseeable Actions

Action	Description	Past	Present	Reasonably Foreseeable
Coal Mining	Underground coal mining is projected to continue at the King II Mine. The level of coal production would depend on market demand for cement and associated coal as well as availability of economically recoverable coal reserves in the immediate area. Based on the unsuitability assessments (BLM 1985; SJNF 1983), 46,000 acres are identified as acceptable for further consideration for coal leasing within the TRFO, with an estimated reserve of 1.5 billion tons. Of this estimated reserve, it is unknown how much is reasonably expected to be developed in the future.	X	X	X

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Action	Description	Past	Present	Reasonably Foreseeable
Oil & Gas Development	The impacts of oil and gas developments, as well as other resource management actions, were addressed in the TRFO 2015 RMP/FEIS based on a reasonably foreseeable development (RFD) scenario of approximately 2,950 new wells in the next 15 years. Only 22 new wells have been approved in the eighteen months since the 2015 RMP was signed. This represents an average of 1.2 new wells every month, which is only 7 percent of the RFD's predicted monthly average.	X	X	X
Agricultural and Livestock Grazing	The continuation of agricultural activities on private lands and livestock grazing on private and federal lands are expected.	X	X	X
Residential Development	Dispersed development would likely continue in Hay Gulch and adjacent areas of La Plata and Montezuma counties. According to a 2015 Regional Housing Alliance (Iverson 2015) study, LPC is projected to grow 52 percent over the next twenty years, generating demand for an additional 15,700 housing units. That equates to about 2 percent population growth per year.	X	X	X
Recreation	Recreational activities on the private lands are expected to continue.	X	X	X

CEQ has further advised that “[t]here may be instances when the timeframe of the Project-specific analysis will need to be expanded to encompass cumulative effects occurring further into the future” (CEQ, Considering Cumulative Effects Under the National Environmental Policy Act, January 1997). For this action, the temporal scope of analysis, as well as the geographic scope of cumulative analysis for each resource, also known as the Cumulative Impacts Analysis Area (CIAA), both depend upon the affected resource and the extent to which there is a combined effect from the various actions. Consequently, the CIAA and the duration of the combined effects are described in relation to each relevant resource or group of resources.

3.2 OVERVIEW OF THE AFFECTED ENVIRONMENT

The terrain of the affected area is varied, with lands to the west dominated by mesas and canyons of the Colorado Plateau and the remaining lands dominated by mountains, foothills, and river valleys of the San Juan Mountains. The Project Area contains the following habitat/landscape features; rolling piñon-juniper woodlands along the edges of Hay Gulch Canyon; bottomlands are characterized by irrigated and non-irrigated pasture lands; there are small areas (less than 0.25 acre) of riparian vegetation along edges of irrigation channels and numerous gulches; deep, steep canyons that contain patches of Ponderosa pine and mature spruce-fir woodlands occur throughout the Project Area.

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The normal temperature range for the area is 14 to 40 degrees Fahrenheit (° F) in January to 55 to 86 ° F in July. The Durango area receives an average annual precipitation amount of approximately 20.84 inches. Average annual wind resultants are generally from the north, west southwest, and east northeast at speeds of approximately 4 to 8 mph. The fastest winds originate from the west (Meteoblue 2017).

Wildlife that may occur in the Project Area include those typically found in southwest Colorado. Game species include mule deer (*Odocoileus hemionus*), elk (*Cervus elaphus*), black bear (*Ursus americanus*), mountain lion (*Puma concolor*), and wild turkey (*Meleagris gallopavo*). Raptor species that may occur include bald eagle (*Haliaeetus leucocephalus*), red-tail hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), and American kestrel (*Falco sparverius*). Numerous other bird species may occur including 29 species listed as Colorado Partner in Flight priority species (BLM and OSMRE 2017).

3.3 RESOURCES NOT ANALYZED IN DETAIL

As mining at the King II Mine is conducted underground, surface resources above the mining in the Project Area would be only minimally impacted by surface activities, such as construction of the low-cover crossing. Over the course of normal mining operations, there are activities that are commonly approved through permit revisions required by the OSMRE or CDRMS or proposed by the permittee. Should any potential future permit revisions create a need to disturb any surface areas within the lease or permit areas, the OSMRE and CDRMS would require environmental review (i.e., cultural resources, sensitive species clearances) prior to approval of permit revisions that include ground-disturbing activities.

Based on internal and public scoping completed by OSMRE, BLM, and cooperating agencies, the following resources have been eliminated from detailed analysis in this EA because the resource is either not present within the Project Area or would not be affected by the Project:

- **Lands with Wilderness Characteristics** – There are no lands either under consideration for wilderness characteristics nor found to have wilderness characteristics in the Project Area.
- **Wild and Scenic Rivers** - There are no designated or proposed wild and scenic rivers within the Project Area.
- **Fire Management** – While there is no BLM surface jurisdiction associated with the surface disturbance under the Proposed Action, the BLM is responsible for wildfire management in the region. MSHA requires fire suppression systems and firefighting plans for both underground and surface operations. Underground mines, such as the King II Mine, are regulated under the fire management regulations at 30 CFR 75.1100. There have been no fires associated with the King II Mine since operations began. There is no expectation of increased fire risk associated with the Proposed Action; therefore, no changes to the BLM’s current fire management plans or programs are warranted at this time.
- **Floodplains** – There are no mapped floodplains or perennial surface water resources in the Project Area. Per Federal Emergency Management Agency (FEMA) flood hazard boundary data, there are no flood hazard boundaries within three miles of the proposed lease modification (USDHS/FEMA 2015).

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- **Wilderness and Wilderness Study Areas** – No wilderness or wilderness study areas are located within the vicinity of the Proposed Action.
- **Public Recreation** – The majority of the area is private land and there is no public access to the isolated BLM parcels in the Project Area. Private and tribal-only recreation is addressed in **Section 3.4.7**.
- **Visual Resources** – The majority of the Proposed Action would occur underground and would meet visual resource management objectives. Proposed surface disturbance occurs on private land where it would not be visible to the general public and no BLM visual resource management class has been assigned.

The following resources have been eliminated from detailed analysis in this EA because the resource was adequately analyzed in BLM and OSMRE (2017) (**Section 1.5**) and no substantive changes in the affected environment or new resource issues were identified:

- **Wildlife** - Information presented in the previous EA (BLM and OSMRE 2017, Section 3.8) regarding wildlife resources in and around the Project Area has not changed and the information on aquatic species, game species, raptors, and migratory birds that was previously described is still relevant and applicable. Additionally, as the Proposed Action is a continuation of the action presented in BLM and OSMRE 2017, impacts discussed in that document, are still applicable and the Proposed Action along with the Applicant-committed design features would have negligible to minor impacts to wildlife resources.
- **Threatened, Endangered, and Sensitive Species** - Information presented in the previous EA (BLM and OSMRE 2017, Section 3.9) regarding threatened, endangered, and sensitive species in and around the Project Area has not changed and is still relevant and applicable. There are no plant species of concern known to occur in the surface disturbance areas of the Project Area. No additional species have been listed by either the USFWS, Colorado Parks and Wildlife, or BLM. As previously described, the Proposed Action would be a continuation of the action described in BLM and OSMRE 2017 and as such, the Proposed Action would have negligible to minor impacts to those species. Consultation with the USFWS was initiated on February 23, 2019, with a determination that the Proposed Action would not adversely affect federally listed species. The USFWS agreed with this determination and responded with a concurrence letter on April 29, 2019 (**Appendix C**).
- **Socioeconomics and Environmental Justice** – There has been no new additional information that would significantly affect the socioeconomic or environmental justice conditions in the area since the completion of the 2017 EA (BLM and OSMRE 2017). Additionally, as the Proposed Action under review in this document is a continuation of the previous 2017 EA action, impacts previously described would be similar over an extended period of time (BLM and OSMRE 2017, Section 3.15.2).
- **Geology and Minerals** – Information on geology and minerals presented in the previous EAs has not changed and is still applicable. Additionally, as the Proposed Action under review in this

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document is a continuation of the previous 2017 action, impacts previously described would be similar over an extended period of time (BLM and OSMRE 2017, Section 3.3).

- **Paleontology** - Information on paleontological resources presented in the previous EAs has not changed and is still applicable. Additionally, as the Proposed Action under review in this document is a continuation of the previous 2017 action, impacts previously described would be similar over an extended period of time (BLM and OSMRE 2017, Section 3.4). If paleontological resources are discovered during mining operations, GCCE shall notify the BLM and OSMRE and shall not disturb such discoveries until the agencies issue further instruction. In addition, a paleontological monitor would be present during the construction.
- **Transportation** - Information on transportation presented in the previous EAs has not changed and is still applicable. Additionally, as the Proposed Action under review in this document is a continuation of the previous 2017 action, impacts previously described would be similar over an extended period of time (BLM and OSMRE 2017, Section 3.10). The amount of traffic is limited through the Class II LUP permit issued by LPC and RIA and would continue through 2043. Therefore, no additional impacts are anticipated since impacts would continue. Potential air impacts for traffic are analyzed in **Section 3.4**. GCCE would continue to follow all existing state and federal highway regulations related to the transport of coal.
- **Vegetation** - Information on vegetation presented in the previous EAs has not changed and is still applicable. Additionally, as the Proposed Action under review in this document is a continuation of the previous 2017 action, impacts previously described would generally be similar over an extended period of time (BLM and OSMRE 2017, Section 3.7). The construction of the low-cover crossing would disturb up to 10 acres of bottomland habitat. Those impacts are discussed below in **Section 3.4.5**.
- **Health and Safety** - Information on health and safety presented in the previous EAs has not changed and is still applicable. Additionally, as the Proposed Action under review in this document is a continuation of the previous 2017 action, impacts previously described would be similar over an extended period of time (BLM and OSMRE 2017, Section 3.2).
- **Soils** - Information on soils presented in the previous EAs has not changed and is still applicable. Additionally, as the Proposed Action under review in this document is a continuation of the previous 2017 action, impacts previously described would be similar over an extended period of time (BLM and OSMRE 2017, Section 3.5). Any soils disturbed through the construction of the low-cover crossing would be restored through the implementation of the design features (**Appendix B**) and GCCE's Reclamation Plan.

3.4 RESOURCE ISSUES ANALYZED IN DETAIL

The resource issues that are evaluated in this EA in detail are based on issues identified during internal and public scoping and include the following:

- Air Quality/Climate Change - What would be the effects of the alternatives on local, regional, and global air quality and global climate change?

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- Water Quality and Quantity - What would be the effects of the alternatives on groundwater and surface water quality and quantity in the local area, and on nearby domestic/residential water wells?
- Cultural Resources - What would be the effects of the alternatives on cultural resources found within the LBA boundary and properties of significance to Indian tribes?
- Noise - What would be the effects of the alternatives on noise levels at residences in the Vista de Oro Subdivision, as well as at residences along the truck haul route?
- Wetlands and WOTUS - What would be the effects of the alternatives on identified wetlands and WOTUS?
- Subsidence - What would be the subsidence effects of the alternatives on natural resources and land uses within the LBA and on the structural integrity of nearby residences and other structures?
- Land Use - What would be the effects of the alternatives on other land uses within and adjacent to the LBA and the mine?

The amount of surface disturbance proposed by GCCE and analyzed in this EA totals 20 acres. Up to 10 acres would be disturbed within the first six months of the Project during construction of the low-cover crossing. That disturbance would be reclaimed upon completion of the low-cover crossing. An additional approximate 10 acres would be disturbed for a variety of typical activities that would be expected to be needed by GCCE or required by the agencies over the life of the mine as described in Section 2.2.3 above. The location, size and timing of such future surface disturbing activities is unknown at this time, but they would be dispersed both in time and in location. The appropriate agency would analyze these activities for potential environmental effects when proposed by GCCE and authorized by the appropriate federal agency and/or LPC with conditions of approval as determined by the agency. If the potential environmental effects are similar to those analyzed in this EA, no further NEPA analysis would likely be required.

Where applicable, information from previous EAs have been incorporated by reference into this discussion (see **Section 1.5**). Additionally, a more in-depth discussion of key issues may be found in the TRR (OSMRE and BLM 2018), found at <https://www.wrcc.osmre.gov/initiatives/kingIICoalMine.shtm>.

3.4.1 Resource Issue - Air Quality/Climate Change

What would be the effects of the alternatives on local and regional air quality and global climate change?

3.4.1.1 Affected Environment

The affected area for the air quality analysis of the direct effects of the Proposed Action includes La Plata and Montezuma counties, although most direct air quality impacts would be limited to the vicinity of the mine. The Cumulative Effects study area is consistent with the area analyzed in the Colorado Air Resources Management Modeling Study (CARMMS). Indirect effects associated with coal transport and combustion

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occur at numerous locations. Most of the coal produced (approximately 83 percent) would be transported by truck to a rail terminal in Gallup, New Mexico. The exact rail transportation routes are not known due to the various coal consumers and potential routes that could be used.

The climate of the area is typical of a semi-arid, continental, mid-latitude region: warm summers and cold winters are characterized by high diurnal and seasonal temperature variations. The flow of Pacific air dominating the climate descends into the area as a warming and drying mass after depositing most of its moisture over the western slopes of the Sierra Nevada and Cascade Mountains. This generally creates a large rain shadow effect over Nevada, Utah, and western Colorado. Typically, severe storms and low-pressure systems bypass the region by deflecting north or south over lower elevations of the Rocky Mountains in Wyoming and New Mexico. The predominant air mass over the Rocky Mountains during the winter is usually continental polar and produces cold, dry air during storm-free periods. High pressure systems that result in fine, light, powdery snow tend to become established in winter over the region which lies within the mean winter storm track. During the summer months, the air masses are generally maritime polar. This region is usually south of the main storm track in the summer; however, localized thundershowers do occur primarily during the afternoon, if a moisture supply is available either locally or in the air mass.

Regulatory requirements include both state and federal ambient air quality standards. The Clean Air Act also regulates air pollution in classes which are governed by the Prevention of Significant Deterioration (PSD) regulations (40 CFR 52.21). The Project Area is in a Class II area as codified in the Colorado State PSD permitting rules. Detailed quantitative and qualitative discussion pertaining to the PSD rules, increment thresholds as well as ambient air quality standards are described in the associated TRR (OSMRE and BLM 2019).

Regional air quality monitors were also evaluated for all applicable standard averaging periods in the counties of Colorado surrounding the Project Area. These include data from 2012-2017 demonstrating that the regional area associated with the Proposed Action meets all applicable air quality standards and is considered in attainment.

The primary natural and synthetic greenhouse gases (GHGs) in the Earth's atmosphere are water vapor, carbon dioxide (CO₂), methane, nitrous oxide, and fluorinated gases. GHGs allow heat from the sun to pass through the upper atmosphere and warm the earth by blocking some of the heat that is radiated from the earth back into space. As GHG concentrations increase in our atmosphere they impact the global climate by further decreasing the amount of heat that can escape back into space. Many GHGs are naturally occurring in the environment; however, human activity has contributed to increased concentrations of these gases in the atmosphere. CO₂ is emitted from the combustion of fossil fuels (i.e., oil, natural gas, and coal), solid waste, trees and wood products, and because of other chemical reactions (e.g., manufacture of cement). Methane is produced by livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills. Methane is also emitted during the production and transport of coal, natural gas, and oil. Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste. Please refer to the TRR (OSMRE and BLM 2019) Section 3.2.1 for further details.

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3.4.1.2 Environmental Effects

Under the Proposed Action, the King II Mine would continue to produce and transport coal at levels below the maximum allowable production limit of 1.3 million tpy (limit is per Colorado Department of Public Health and the Environment (CDPHE) Air Quality Permit No. 09LP0202F, Final Approval – Modification 1, Condition No. 2, dated 9/3/2013). Additionally, haul truck traffic is limited to about 1.1 million tpy in accordance with the LPC LUP (Project # 2012-0089) and RIA. It ultimately limits the truck trips to a maximum of 120 per day when all road improvements have been completed.

For this air analysis, direct annual emissions calculations are based on each of the three annual production scenarios: producing an estimated 800,000 tons, 1.1 mt, and 1.3 mt. However, the total tonnage produced estimated throughout the life of the mine (22 years) is 17 mt. These emissions are associated with permitted and unpermitted sources, and both point and fugitive emissions. Another source of direct emissions is the construction of the low-cover crossing. A total of approximately 20 acres would be disturbed by the Project over the life of the mine. This would include 10 acres for construction of the low-cover crossing at the outset of the Project and 10 acres cumulatively for all other dispersed surface disturbances of variable sizes that would occur over the life of the mine. Other indirect emissions are associated with downstream coal combustion and commuter traffic.

Effects of Alternative A – Proposed Action

Direct Effects

With the exception of particulate matter, all the directly emitted criteria pollutants from the King II Mine's operations are from fuel combustion sources, such as mobile mining equipment and haul trucks, and from stationary sources such as emergency generators and heaters. Also, coal mine methane (CMM) is directly emitted by the ventilation air handling system required by the MSHA to reduce the combustion/explosion potential of the mine's underground atmosphere. Particulate emission sources include stockpiles, crushers, screening, conveyors, and loadout sites. Lastly, construction emissions associated with the construction of the proposed low-cover crossing and other dispersed surface disturbing activities over the life of the mine is also considered an indirect effect of the Proposed Action. Emission calculations are based on total volume removed (248,888 cubic yards), no off-site movement of material, watering and chemical suppressant (magnesium chloride: 85 percent control) on unpaved roads, specific construction vehicle fleet and worker commuting travel. For a detailed discussion of emission calculations refer to the Environmental Effects in the TRR (OSMRE and BLM 2019) (Section 3.2.2). **Table 3-2** provides a summary of projected direct emissions associated with the Proposed Action at the permitted 1.3 mt per year. Direct emissions from the Proposed Action would produce a minor impact on an annual basis because the overall change is not substantial but does have a measurable amount.

Table 3-2. Total Project Emissions (Tons)

Source	PM ₁₀	PM _{2.5}	CO	NOx	VOC	SO ₂	CO ₂	CH ₄	N ₂ O
Annual Unpermitted Sources	3.83	3.74	14.87	39.56	26.49	0.64	N/A	N/A	N/A

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Source	PM ₁₀	PM _{2.5}	CO	NO _x	VOC	SO ₂	CO ₂	CH ₄	N ₂ O
Annual Permitted Sources ¹	29.10	4.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Low-cover Crossing	2.6	0.5	2.4	4.6	0.6	0.01	N/A	N/A	N/A
Annual Total ²	35.53	8.24	17.27	44.16	27.09	0.65	N/A	N/A	N/A
Lifetime Unpermitted Sources	N/A	N/A	N/A	N/A	N/A	N/A	49,304	13,606	0.54
Lifetime Permitted Sources	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Low-cover Crossing	N/A	N/A	N/A	N/A	N/A	N/A	1,630	89.86	40.99
Lifetime Total ²	N/A	N/A	N/A	N/A	N/A	N/A	50,934	13,696	41.53

¹ The permitted emissions include both point and fugitive sources and annual emissions that were derived from the CDPHE permit that allows 1.3 mt production as shown in **Table 2.2-9** in the TRR.

² GHG emissions are considered longer term pollutants than annually because they tend to stay in the atmosphere for much longer periods of time. Criteria pollutants are assessed on an annual because of shorter averaging period standards.

Indirect Effects

Indirect air emissions from the Proposed Action were estimated for activities that are reasonably foreseeable and include: coal transport (where the destination is within the USA and the quantity of delivered coal is known), mine worker commutes, and downstream coal combustion.

On average, approximately 448,785 tpy is transported by truck to the rail terminal in Gallup, New Mexico for delivery to GCC plants in Mexico and to variable cement plant buyers in the Southwest depending on markets, alternative fuels, and coal supply. GCCE supplies approximately 193,100 tons of coal to two cement kilns and two narrow gauge railroads directly, while the remainder of the coal is shipped (via the Gallup, NM rail terminal) to GCC cement plants in Mexico (240,000 tpy) and to variable cement facilities in Arizona and Texas. Both GCC cement kilns operate under state issued air permits, and both facilities are subject to Title V permitting requirements (i.e., they are classified as major stationary sources).

The GCC Rio Grande Pueblo Plant (**Table 3-3**) has a permit (#98PB0893) condition that limits annual firing fuel (coal and tire derived fuel (TDF)) to no more than 198,418 tons on a rolling 12-month basis. The King II Mine currently supplies 105,000 tons of coal annually (approx. 53 percent by weight) to the facility and expects this to remain constant going forward. The GCC Rio Grande Tijeras Plant (**Table 3-4**) has similar operations to that of the Pueblo facility and is covered under NM Title V permit #532. The permit and underlying construction permits provide for all the same source requirements (controls and monitoring) as the Pueblo facility and is publicly available from the Albuquerque Environmental Health Department for review. Unlike the Pueblo facility the Tijeras kiln is fired entirely on coal (a minor amount of natural

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gas is used for startup) and the kilns themselves do not appear to have fuel throughput limits, but rather performance-based clinker production limits (33.7 tons/hour).

Table 3-3. Pueblo Facility King II Mine Emissions (tpy)

Source	PM ₁₀	PM _{2.5}	CO	NO _x	VOC	SO ₂	CO ₂ e ¹	Hg (lb/yr)
Facility	221	217	588	604	52	505	735,230	25

¹ CO₂e emissions are based on 2017 Environmental Protection Agency (EPA) FLIGHT reported emissions

Table 3-4. Tijeras Facility King II Mine Emissions (tpy)

Source	PM ₁₀	PM _{2.5}	CO	NO _x	VOC	SO ₂	CO ₂ e ¹	Hg (lb/yr)
Facility	135	66	790	772	79	21	306,846	10

¹ CO₂e emissions are based on 2017 EPA FLIGHT reported emissions

Other indirect emissions include total cement production and general combustion of other sources such as rail lines. The indirect emissions would have a moderate impact on the region as all the coal extracted from the mine would be burned at the various cement plants, which currently operate nearly 100 percent on coal from King II Mine. The impact is considered moderate because the surrounding air quality meets all National Ambient Air Quality Standards (NAAQS), but the overall emissions are substantial enough to be more than negligible (lowest level of detection). A detailed discussion regarding these emissions can be found in the accompanying TRR (OSMRE and BLM 2019) Section 3.2.2.

Cumulative Actions and Effects

The cumulative impact assessment for air quality considers air emissions from mine operations and coal transport when added to other past, present, and reasonably foreseeable future actions. The cumulative impacts to air quality in the King II Mine area would result primarily from emissions of PM_{2.5/10} from the current and future activities occurring within the region such as agriculture, ranching and grazing, and vehicle traffic.

To examine potential cumulative air quality impacts from activities that it authorizes, BLM initiated the CARMMS. The study version 2.0 was primarily concerned with assessing statewide impacts of projected oil and gas development (both federal and fee (i.e., private)) out to year 2025 for three development scenarios (low, medium, and high), but also included a statewide mining impact assessment. Projections for development are based on either the most recent RFD document (high), or a projection of the current 5-year average development pace forward to 2025 (low). The medium scenario includes the same well count projections as the high scenario, but assumes restricted emissions, whereas the high scenario assumes current development practices and existing emissions controls required by regulations (Environ 2017).

The PM contributions from all the mines appears to be low around the King II facility (not more than 0.4 micrograms per cubic meter (µg/m³) of air for PM₁₀ and 0.2µg/m³ for PM_{2.5}). The other pollutants, nitrogen

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dioxide (NO₂) and ozone (O₃) are also equally minor impactors, although we note that the ozone predictions are a function of the mine's direct nitrogen oxides (NO_x) and volatile organic compound (VOC) contributions and does not include CMM VOCs since they are unknown. For further detail regarding CARMMS and the air quality impacts projected in 2025 please refer to the Cumulative Effects Air Quality Section of the TRR (OSMRE and BLM 2019).

The U.S. Department of the Interior (USDI), Office of Natural Resources Revenue, data shows that in 2017, production of federal coal in the U.S. totaled approximately 326,073,802 tons (USDI 2018). As a whole (federal and non-federal), the U.S. produced approximately 774,609,357 tons of coal in 2017 (U.S. Energy Information Administration 2017). Federal coal made up approximately 42.1 percent of the total 2017 production, and in general has declined along with the total coal production nationally. On an annual basis, the maximum production year for the Proposed Action (800,000 – 1.3 mt) would represent a range of 0.24 – 0.40 percent of all federal coal produced nationally and 0.10 – 0.17 percent of all the coal produced in the U.S. relative to 2017. The total direct and estimated indirect GHG emissions from the maximum projected King II production (based on annual emission estimates) would be approximately 0.28 percent of the total U.S. emissions relative to 2016, and 0.038 percent of the total global GHG burden relative to 2014 on a worst-case year annualized basis. Additional analysis regarding GHGs can be found in the TRR (OSMRE and BLM 2019).

The Proposed Action is expected to extend the life of the mine for 22 years with a total of 17 mt of coal being mined (19 years @ 800,000 tons and 3 years @ 600,000 tons). Direct, indirect, and downstream coal combustion emissions were calculated for the duration of the Proposed Action (22 years). Based on estimated mining rates, construction of the low-cover crossing, EPA FLIGHT data from 2017 for the Tijeras and Pueblo cement facilities and current estimated downstream combustion, approximately 450.6 mt of CO₂e could be emitted over the life of the Project. For further detail, please refer to the TRR (OSMRE and BLM 2019).

Effects of Alternative B - No Action Alternative

Direct Effects

Under the No Action Alternative, the LBA would not be offered for competitive lease sale by BLM, there would be no mining plan modification to be considered and approved by OSMRE and federal coal reserves in the LBA and new private reserves would not be recovered. The mine would continue to operate under the current mine plan with a maximum LPC permitted production level of about 1.1 million tpy until such time that all the available coal reserves are exhausted. However, production levels would probably continue at approximately 800,000 tpy which would exhaust the available reserves by about 2022. The levels of air emissions from the stationary and mobile sources at the mine would be roughly the same as those estimated and analyzed for the Proposed Action but would end prior to 2023. Section 3.2.1.4 of the TRR (OSMRE and BLM 2019) identifies the regional air quality in detail and shows that all NAAQS are met. With the Proposed Action eliminated, the PM impacts would decrease to maintain attainment. Gaseous and hazardous pollutant emissions are somewhat limited at the mine and their removal would not change the impact of the regional air quality significantly but is still a reduction from the Proposed Action.

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Impacts to climate change would be slightly less as 3.2 mt of coal would be mined from King II (assuming 800,000 tpy from 2019 through the end of year 2022). It is not known whether end users of this coal would purchase other coal (i.e., same/similar GHG impacts) for fuel or whether alternative fuels would replace the coal used in cement kilns (i.e., natural gas, tires, etc.). Total coal production would be reduced from 17 mt during the life of the Proposed Action to 3.2 mt, which is only 18.8 percent. Also, the low-cover crossing construction would not occur under the No Action Alternative. The CARMMS data suggests that the overall air quality impacts surrounding the mine would be negligible when compared to other potential sources in the state of Colorado.

Indirect Effects

It is likely that all of the indirect sources would continue operating regardless of the availability of the King II coal given their economic incentives to do so. These indirect sources would continue to incrementally contribute GHG emissions to the biosphere, which could contribute to climate change. The emissions from the burning of this specific coal would not occur, and there is uncertainty as to continued operation and fuel sources for the existing cement plants under the No Action Alternative.

Cumulative Actions and Effects

Cumulative effects would likely not change much under the No Action Alternative because the total coal production from the Project is not substantial when compared to all other national and international sources of coal production. The emissions from the burning of this specific coal would not occur, and there would be uncertainty as to continued operation and fuel sources for the existing cement plants under the No Action Alternative. For further details, please refer to the CARMS section of the TRR (OSMRE and BLM 2019).

3.4.2 Resource Issue - Water Quality and Quantity

What would be the effects of the alternatives on groundwater and surface water quality and quantity in the local area, and on nearby domestic/residential water wells?

3.4.2.1 Affected Environment

The La Plata River, located approximately two miles north of the Project Area, is the main perennial stream in the area, and water is diverted from the La Plata River along Hay Gulch for irrigation use. The main water-bearing geologic units in the vicinity of the King II Mine are the Cliff House, Menefee, and Point Lookout formations of the Mesa Verde Group. The Quaternary alluvium in the Hay Gulch area overlies the Late Cretaceous Mesa Verde units and is the most important hydrologic unit for water supply (RHS 2016a). For a more detailed description of the affected environment, please see Section 3.3.1 of the TRR.

Surface Water Resources

Surface water resources within the area encompassed by the King II Mine and its associated CIAA for water resources include drainages classified as ephemeral and intermittent by OSMRE (2017). Ephemeral streams flow only in response to precipitation events or snow melt and include East and West Alkali Gulch which cross the King II Mine underground workings and are tributary to Hay Gulch below Mormon Reservoir. The Gulch parallels the western boundary of the permit area and separates the King II mine workings from the Project Area to the west. The Gulch is an intermittent stream with a portion of the

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stream drainage below the water table, allowing for flow in a segment of the stream over part of the year derived from groundwater.

Because of the lack of perennial streams in the Project Area and the CIAA, quantification of surface water is limited to storm events or flow in irrigation ditches (OSMRE 2017). The Hay Gulch Ditch is a year-round diversion from the La Plata River and showed a range in flow rates from 0.28 to 1.5 cubic feet per second (cfs) during the period from April 2016 to March 2017. The typical flow rate was on the order of 1.0 cfs (OSMRE 2017). To date, there are no water quality data on storm water runoff. The Hay Gulch Ditch water is sodium/calcium bicarbonate water with a pH of 8.2, total dissolved solids (TDS) of 100 to 700 mg/L (RHS 2017); most constituents are below drinking water standards (RHS 2017). Water in the Mormon Reservoir is calcium/magnesium sulfate water with a pH of 7.8, and a TDS ranging from 1,000 to 1,500 mg/L due to evapo-concentration (OSMRE 2017).

Ground Water Resources

Groundwater in the Project Area and the CIAA is found in the alluvium of Hay Gulch and in bedrock geologic units in the Cliff House Sandstone, the Menefee Formation, and the Point Lookout Sandstone members of the late Cretaceous Mesa Verde Group.

Alluvial Groundwater

Alluvial groundwater is present in the Hay Gulch alluvium and in some of the unconsolidated alluvial sediments that fill topographic lows in the ephemeral stream systems. Hay Gulch has groundwater that is sufficient in quantity for agricultural and stock water use during the summer months. Groundwater in the alluvial aquifers is generally unconfined (RHS 2016a). Groundwater in the La Plata River alluvium along the eastern margin of the CIAA is tapped by hundreds of domestic wells that yield up to 65 gallons per minute (gpm) (RHS 2016a). Groundwater in the Hay Gulch alluvium is found in the upper 100 ft of the alluvium and yields water on a seasonal basis for agricultural and stock water use at variable rates generally below 30 gpm. Groundwater in the alluvium of The Gulch exhibits spatially limited saturation and is highly variable depending on seasonal precipitation. Groundwater in the alluvium of Cherry Creek along the eastern margin of the CIAA yields water to domestic wells at rates up to 30 gpm (OSMRE 2017).

Alluvial groundwater quality has been monitored for several years by GCCE along Hay Gulch and varies both spatially and temporally. In general, the pH of alluvial water is in the range of pH 7.0 to 8.0. TDS is highly variable and generally ranges from 400 to 800 mg/L but can be as high as 1,480 to 1,580 mg/L in the Wiltse Well (RHS 2016b; 2017). Sulfate can range from 400 to 800 mg/L. Most alluvial water samples exceed the drinking water standard of 500 mg/L for sulfate but have trace metals within drinking water standards (RHS 2017).

Groundwater quality in Alkali Gulch is monitored by two wells, MW-7EAA (upgradient) and MW-8EAA (downgradient). The water quality in both monitoring wells is calcium/magnesium sulfate water and the water does not meet drinking water standards.

Cliff House Sandstone Groundwater

The Cliff House Sandstone is the uppermost bedrock unit in the King II Mine area and therefore dominates surface exposures of bedrock. The thickness of the unit averages 350 ft and the formation is dissected by

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drainages originating from mesa tops (OSMRE 2017). The Cliff House is a marine, medium-grained calcareous sandstone that thins to the east. Monitoring well clusters installed by GCCE have demonstrated that the Cliff House is basically unsaturated in the Project Area but does contain minor water-bearing fractures. Most wells screened in the Cliff House were either dry or became dry shortly after drilling (OSMRE 2017).

Menefee Formation Groundwater

The Menefee Formation is a non-marine assemblage of sandstones, shales, siltstones, and coals. The thickness in the Project Area is around 300 ft and this unit is the main coal-bearing unit mined in the King I and King II mines (OSMRE 2017).

The upper Menefee, which is the part of the Menefee Formation targeted for coal mining, is not known to be an aquifer (RHS 2016a). The interval of the upper Menefee in the Project Area is known locally to be unsaturated based on exploration drilling by GCCE (OSMRE 2017). The lower Menefee may be an aquifer in the southern part of the CIAA as the formation deepens to the south with a regional dip of two to three degrees (OSMRE 2017).

Point Lookout Sandstone Groundwater

The Point Lookout is the lowest stratigraphic unit in the Project Area and consists of near-shore marine sands grading upward into barrier sands. The formation is dominated by fine sandstones and silty sandstones. The groundwater yield is low (OSMRE 2017).

It is likely that many of the deep bedrock wells in the Project Area that are screened in the lower Menefee are drawing water from fractured sections of the upper Point Lookout because of possible hydraulic connections between the upper Point Lookout and the lower Menefee (OSMRE 2017).

3.4.2.2 Environmental Effects

Effects of Alternative A – Proposed Action

The Proposed Action would consist of expansion of the King II Mine workings underneath and west of East Alkali Gulch and construction of the East Alkali Gulch low-cover crossing (**Section 2.2.3**). A total of approximately 20 acres would be disturbed by the Project over the life of the mine. This would include 10 acres for construction of the low-cover crossing at the outset of the Project and 10 acres cumulatively for all other dispersed surface disturbances of variable sizes that would occur over the life of the mine. The Gulch crossing would likely be in bedrock below about 25 to 50 ft of alluvial material and would be an extension of the existing underground workings in the King II Mine. Construction of the crossing would involve trenching in the valley floor of The Gulch and construction activities that when completed would be backfilled and covered with topsoil. The valley floor would be restored to near original conditions using HDPE liners and gravel.

Direct and Indirect Effects

The Gulch low-cover crossing would be constructed in bedrock and therefore would not be expected to impact ephemeral or intermittent flow in The Gulch. The stream crossing of The Gulch would involve trenching in the valley floor and significant disturbance of The Gulch during construction activities. The valley floor of the Gulch would be restored to near original condition following construction of the Gulch

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crossing. The proposed disturbance of the valley floor of The Gulch would potentially affect storm water flow during periods of heavy rainfall during construction. Temporary diversion of this storm water flow around the construction area and then back into the Gulch would be required. Impacts to surface water resources in The Gulch would be minor to moderate, short-term, and local.

No large scale change in the mining rate is expected, suggesting that the Proposed Action would not impact the existing water balance for groundwater, as the mine would not require mine dewatering. Therefore, groundwater quantity should not be impacted. Groundwater in Alkali Gulch is at a depth of 36 to 40 ft. Trenching in Alkali Gulch is expected to stay above the groundwater table and thus impacts to groundwater quality are not expected. As such, impacts to groundwater resources would be negligible, short-term, and local. In addition, no impacts would be expected to nearby residential water wells. For a more detailed description of the potential direct and indirect environmental impacts, please see Section 3.3.1 of the TRR (OSMRE and BLM 2019).

Cumulative Actions and Effects

Cumulative effects for water resources would revolve around the Mormon Reservoir, additional water needs if coal mining continues to expand in the area, and domestic, agricultural, and livestock use of surface and groundwater resources as residential and agricultural growth continues in the CIAA. For surface water, increased diversion of water from the La Plata River would be a cumulative effect. For groundwater, agricultural and domestic use of water from the Hay Gulch alluvial aquifer and from the Point Lookout Sandstone aquifer would be cumulative effects. Because mining does not use groundwater, increased mining demand for water would affect mainly surface water because of the potential for increased diversion of water from the La Plata River. The Proposed Action, because it would not involve an increase in demand for surface water and does not impact groundwater would not be expected to contribute to cumulative effects for water in the CIAA.

Effects of Alternative B - No Action Alternative

Under the No Action Alternative, the LBA would not be offered for competitive lease sale by BLM, there would be no mining plan modification to be considered and approved by OSMRE and federal coal reserves in the LBA and new private reserves would not be recovered. Mining at the King II Mine would continue under existing permits and no expansion of the mine would occur. Water use and the water balance for the mine would continue under existing permits until the existing coal reserves are mined out in about 2022. There would be no potential impact to The Gulch.

Direct and Indirect Effects

Surface and groundwater resources in the area of the King II Mine would be utilized and managed as they have been for the past few years in accordance with existing permits. There would be no impacts to surface water or groundwater, including to nearby residential water wells.

Cumulative Actions and Effects

Cumulative effects under the No Action scenario would be the same as for the Proposed Action. Domestic, agricultural, and stock water use would be the main impacts to surface and groundwater resources. Mining would not be expected to contribute to the cumulative effects for water.

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3.4.3 Resource Issue – Cultural Resources

What would be the effects of the alternatives on cultural resources found within the LBA boundary and properties of significance to Indian tribes?

3.4.3.1 Affected Environment

The Project Area is located within the Northern San Juan Cultural Region, on the periphery of the Colorado Plateau physiographic province. Several cultural traditions are represented in the region, from Paleoindian occupation to the Euro-American settlement of the area, which includes both the existing King II lease and permit areas as well as the proposed lease modification area and the entire length of CR 120 in the Project Area. For an in-depth discussion of the cultural history of southwestern LPC, the reader is referred to Winter et al. (1986) as well as Lipe et al. (1999).

As required by the NHPA, intensive archeological field investigations were conducted on the Project Area. **Table 3-5** is a summary of the past cultural resource inventory work completed in the Project Area.

Table 3-5. Previous Cultural Resource Inventories

Survey Year	Project Name	Affiliation	Acres Surveyed	NRHP-eligible Sites
2005	East Alkali Mine, Hay Gulch Area	CASA	50	none
2010	Class III Cultural Resource Inventory of the King II Mine Expansion	SWCA	160	5LP9601
2011	Archaeological Survey of Five Proposed 1-Acre Drill Hole Locations at the King II mine	PaleoWest	5	none
2013	A Class III Cultural Resource Inventory for Proposed Additional Drilling within the existing King II Mine Lease Area A	PaleoWest	577	5LP10591.1*
2014	Class III Cultural Resource Inventory of 24 Test Drill Locations, 4 Revised Drill Locations, and Access Roads	PaleoWest	-	none
2014	Class III Cultural Resource Inventory of 9 Core Drill Sites	SWCA	-	none
2016	An Intensive Cultural Resource Inventory for GCCE's Proposed Groundwater Monitoring Wells	SEAS	2.6	5LP11050
2018	Cultural Resource Survey of GCCE's Phase II Coal Exploration Drilling (11 Exploratory Wells)	SEAS	5.7	none
2018	Cultural Resource Inventory for GCCE's Proposed King II Mine Dunn Ranch LBA Project	SEAS	1,392	5LP11384** 5LP11386** 5LP11387**

*non-contributing segment to an NRHP-eligible resource within survey area

**Need data, sites are potentially eligible for the NRHP

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3.4.3.2 Native American Concerns

The OSMRE and BLM initiated Government to Government consultations on October 30, 2018, by sending 60 consultation letters to 26 Native American tribes (TRR (OSMRE and BLM 2019), Table 3.4-2) that have cultural affiliations to the APE. In accordance with the 2011 DOI Policy on Consultation with Indian Tribes and the NHPA of 1966, this included those from the Colorado Office of Archaeology and Historic Preservation directory of tribes with historic ties to Colorado. The Hopi Tribe claims cultural affiliation with prehistoric cultural groups in southwestern Colorado. The Southern Ute Indian Tribe expressed concern for impacts on properties of religious and cultural importance to the tribe. Native American consultation is ongoing.

3.4.3.3 Environmental Effects

The Dunn Ranch Area LBA and Mining Plan Modification Project is considered a federal undertaking subject to compliance with Section 106 of the NHPA of 1966. The NHPA (PL 89-665; 80 Stat. 915; 16 USC 470 et seq.), as amended, and its implementing regulations (36 CFR 60 and 800) require that federal agencies take into account the effects of their undertakings on important archaeological and historic sites (i.e. historic properties) in the area of potential affect (APE). In the terminology of NHPA, historic properties are those that are determined to be eligible to the National Register of Historic Places (NRHP). As such, OSMRE and BLM will assess whether the Project would have no effect, no adverse effect, or adverse effects to historic properties. Consultation with consulting parties including the State Historic Preservation Officer and Indian tribes including the UMO Tribe and other interested tribes is ongoing. The APE for cultural resources includes the direct footprint above mining operations at the Dunn Ranch Area LBA and any areas of direct surface disturbance, as consulted on between the OSMRE and BLM with the UMO Tribal Historic Preservation Office and the State Historic Preservation Office (SHPO). The APE covers a large area, primarily due to the possibility of surface subsidence resulting from underground mining operations. A total of approximately 20 acres would be disturbed by the Project over the life of the mine. This would include 10 acres for construction of the low-cover crossing at the outset of the Project and 10 acres cumulatively for all other dispersed surface disturbances of variable sizes that would occur over the life of the mine. No surface modifications are proposed and no buffer zones were inventoried beyond the APE (**Figure 1-2**).

Cultural resource sites can be directly or indirectly impacted by surface disturbing activities or the construction of associated mining infrastructure. “Needs data” sites are managed as though they are eligible for the NRHP until further evaluated. Indirect impacts may include increased subsidence, soil erosion and gullyng, vibration from blasting, and dust from operations. In addition, there would be increased potential for unlawful artifact collection and/or vandalism of cultural resources.

Table 3-6 summarizes the cultural resources within the APE (i.e., disturbance area and Dunn Ranch LBA). All of the sites are within the Dunn Ranch LBA.

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Table 3-6. Cultural Resource Sites Within Analysis Area

Site Number	Site Type	Cultural Affiliation	NRHP Evaluation
5LP10572	Temporary Camp (hunting cabin)	Historic UMU	Not eligible
5LP11383	Temporary camp	Historic UMU	Not eligible
5LP11384	Artifact Scatter	Late Archaic	Potentially eligible (needs data)
5LP11385	Artifact Scatter	Unknown historic	Not eligible
5LP11386	Artifact Scatter	Late Archaic	Potentially eligible (needs data)
5LP11387	Artifact Scatter	Middle to Late Archaic	Potentially eligible (needs data)
5LP11388	Ranching facility	Historic UMU	Not eligible

Effects of Alternative A – Proposed Action

Direct and Indirect Effects

The potential surface disturbing activities would total approximately 20 acres. Of the 7 cultural resource sites within the APE, none would be impacted by the Project as no surface disturbance is proposed in the site areas. Further, these sites would be subject to cultural resource avoidance monitoring requirements. If future mining operations cannot avoid NRHP-eligible sites, those activities would be federal undertakings subject to Section 106; a mitigation plan would be written, approved by OSMRE in consultation with SHPO, and implemented prior to planned mining activities. Any impacts to these sites would constitute an adverse, long-term effect. No mitigation or avoidance is required for sites that are not eligible for the NRHP.

Cultural resources (**Table 3-6**) could be impacted by subsidence as they are located above proposed panels. This potential impact is expected to be negligible to minor as subsidence occurs very infrequently at King II due to a variety of factors, such as the stability of the Cliff House sandstone (**Section 3.4.6**). As noted in **Section 3.4.6**, the subsidence that has occurred has been less than 1 foot in depth, and 0.25 to 0.5 ft in width. In the existing federal permit and lease areas, no effects to historic properties have been observed due to subsidence.

Potential impacts for all NRHP-eligible or potentially eligible sites could be monitored as part of the cultural resource monitoring requirements. Although very few workers would need to be in the area, to preclude the potential indirect impact of unlawful artifact collection and/or vandalism of cultural resources, mine personnel and sub-contractors would receive training on the identification of cultural sites and features, as well as the procedures to be followed and the legal penalties for failure to follow the guidelines, laws, and statutes.

If previously unidentified cultural sites are observed during actions within the permit area and could be affected by those actions, the appropriate cultural resource specialists, the UMU Tribe, and/or the SHPO, as appropriate, would be contacted for direction in protecting the resource.

For any proposed future ground-disturbing activities within the proposed lease and permit areas, GCCE would be required by their OSMRE and CDRMS mine permits to complete cultural clearance surveys and obtain agency authorization prior to conducting any ground disturbances. Avoidance of cultural resources is the preferred approach to avoiding or minimizing potential impacts to the resource. As a result of

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regulatory oversight, avoidance measures, and when appropriate, data recovery, residual impacts to cultural resources would be negligible. Consultation with consulting parties is ongoing; however, the agencies anticipate a finding of no effect under the NHPA.

Native American Concerns

On tribally owned fee restricted lands, three sites, 5LP11384, 5LP11386, and 5LP11387, were identified that are potentially eligible to the NRHP and another four as ineligible (**Table 3-6**). None of these would be impacted by the Project as no surface disturbance is proposed in these areas and subsidence impacts are unlikely as discussed above. Further, these sites would be subject to cultural resource avoidance monitoring requirements. No traditional use areas have been identified to date within the permit area. At present, no Native American religious concerns or potential traditional cultural properties within the permit area have been identified by Indian tribes including the UMU Tribe. No effects to sites on tribally owned fee restricted lands are expected from the Proposed Action.

Cumulative Actions and Effects

The CIAA for cultural resources is the mine boundary and the Dunn Ranch LBA. Although direct impacts would be avoided, potential indirect impacts to cultural resources would come from the potential for subsidence. Ranching and livestock grazing impact cultural resources through trampling and artifact displacement. Additional coal leasing and subsequent development, as well as oil and gas leasing and development, would be subject to NHPA and Section 106 oversight. Along with the past, present, and reasonably foreseeable future actions, mining in the Project Area is likely to result in negligible to minor cumulative impacts to cultural resources in the region due to the small area of surface disturbance.

Past, present, and reasonably foreseeable disturbance to cultural resources in the CIAA have been and would be the result of mining activities, utility infrastructure, road development, archaeological excavation, livestock grazing, private development, and likely vandalism and artifact collection. Private development and vandalism/artifact collection are not quantifiable.

Section 106 of the NHPA requires consideration of the effects of federal actions to historic properties. If historic properties (i.e., NRHP-eligible cultural resources) cannot be avoided by the Proposed Action, these sites would be subject to a resolution of adverse effects, which may include mitigation such as data recovery. Consultation with consulting parties is ongoing; however, OSMRE and BLM anticipate a finding of no effect under the NHPA. Any future actions requiring federal approval that could adversely affect historic properties would be defined as future undertakings and are not expected. If historic properties are not avoided, the Project would contribute to cumulative impacts to historic properties in combination with past, present, and reasonably foreseeable future activities in the CIA.

Effects of Alternative B – No Action

Direct and Indirect Effects

Under the No Action Alternative, the LBA would not be offered for competitive lease sale by BLM, there would be no mining plan modification to be considered and approved by OSMRE and federal coal reserves in the LBA and new private reserves would not be recovered. There would be no impacts to the cultural resources listed in **Table 3-6** under the No Action Alternative.

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Cumulative Actions and Effects

Cumulative impacts under the No Action Alternative would be the same as under the Proposed Action but would be limited to the current lease and permit areas.

3.4.4 Resource Issue – Noise

What would be the effects of the alternatives on noise levels at residences in the Vista de Oro subdivision, as well as at residences along the truck haul route?

3.4.4.1 Affected Environment

Noise

The Proposed Action and existing King II Mine surface facilities are located at the confluence of two narrowly incised drainages nearly 7 miles from the nearest town of Hesperus. The closest residences are located along County Road 120 (BLM and OSMRE 2017, Map A-7), and in the Vista de Oro subdivision, located approximately 1.5 miles southwest of the mine surface facilities (BLM and OSMRE 2017, Map A-7).

Measurable characteristics of noise are measured as intensity in decibels (dB), frequency (the number of cycles per second or Hertz), spectral content (intensity versus frequency over the entire time varying noise), duration (continuous or impulsive), number of noise events over a given time period, and pattern of occurrence. Stationary noise sources associated with GCCE mining operations have been identified as the mine ventilation fan and coal processing equipment. Off-site noise sources include the coal haul trucks with noise generating components such as the engine, transmission, and tires.

An initial sound study of mine operations was completed by Engineering Dynamics, Inc. (EDI) (EDI 2013). This sound study, as well as a vibration study, were included in the Summary of Analytical Activities in Response to Neighborhood Comments in Conjunction with a Permit Expansion of GCCE – King II Mine by CDS Environmental Services LLC, (CDS) dated May 8, 2014 (CDS 2014).

The studies were reviewed by Dr. Catherine T. Aimone-Martin of Aimone-Martin Associates on behalf of LPC. Dr. Aimone-Martin's comments were presented in her report titled "Review of Noise and Vibration from CR 120 Truck Traffic and Mining Operations at the GCCE King II Mine" dated September 7, 2015 (Aimone-Martin 2015).

Wave Engineering, Inc. (Wave) performed an additional sound study that included background noise measurements without coal-hauling trucks running, measurements of haul trucks passing by on gravel and paved road surfaces, and computer modeling to assess the noise impact of haul trucks on the residences along CR 120. The computer model was also used to evaluate the potential noise mitigation offered by sound barriers, speed limitations, and limiting the hours of trucks.

The following items from Wave's report (2016), King II Mine Noise Assessment, are noted:

- Measurements were taken at approximately 50 ft from CR 120 centerline and at a second location near residences;
- Baseline noise at residences is well below noise from traffic, with the highest background value being recorded at 10 A-weighted decibels (dBA) due to wind gusts exceeding 10 mph;

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- As expected, travel uphill and with a loaded haul truck, increased noise considerably;
- The speed at which trucks travel has a significant effect on noise—approximately an 8 dBA increase between 12 and 22 mph. During the study, trucks slowed to 10 mph on gravel road portions near residences;
- Haul trucks traveling at 10 mph on flat portions of the road did not have an alternative effect; and
- All haul trucks measured had noise levels below 86 dBA, a cited limit established by the State of Colorado.

Subsequent to these studies, the gravel portions of the road near residences have been paved to reduce vehicle noise (personal communication, Sarah Vance GCCE 2018).

There is no county or state code or ordinance that currently limits noise levels from trucks. C.R.S. Section 25-12-107 allows counties to limit heavy truck noise levels to 86 dBA 50-ft from the centerline of the lane of travel. All trucks that were measured in the Wave study were well below this level. Background ambient noise levels were measured (without truck noise) at four locations along CR 120 during a weekend, with continuous day and night measurements. Depending upon the location, ambient sound levels ranged from about 37 dBA to 52 dBA during the day and 29 dBA to 48 dBA at night.

Since LPC does not have an applicable noise standard for coal mine facilities, C.R.S. Section 25-12-103 standards are used to establish maximum permissible noise levels in residential, commercial, and industrial locations. These standards set limits for residential properties of 55 dBA daytime (7:00 a.m. to 7:00 p.m.) and 50 dBA nighttime at 25 ft from the property line. The standards include further limitations for periodic, impulsive, or shrill noise such as back-up alarms and warning devices.

As a result of these studies, Wave evaluated the potential effectiveness of noise barriers using a model that assumed a 12-foot-high wall and a break for a driveway (which greatly decreases barrier effectiveness). GCCE prepared a noise and visual buffering plan for site-specific conditions at 2541 and 3230 (McCue and Hunzeker) CR 120. As a result of this, the following measures have been and are currently being implemented:

- Damper has been installed on the main fan;
- Warning signals on load-out equipment have been adjusted to lowest legal levels;
- Mining has been eliminated within 300 ft of residences; and
- All of the conditions of the LPC Special Land Use permit regarding noise have been complied with, including a noise barrier at the Hunzeker residence.

Vibration

Adjacent landowners perceived vibration sources from the mine were associated with the ventilation fan and underground miner equipment.

The EDI study (2013) tested for the presence of vibration and sound emanating from mining activities near neighboring residences. Vibration studies reported no detectable ground motion near adjacent landowners' test locations and only low-level ground motion levels within 10 ft of the mine ventilation fan and conveyor located on surface. The study also indicated that this low-level ground vibration would not

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transmit beyond the immediate vicinity. These results would also be expected to apply to mining in the Project Area and equipment and vehicle operation through the low-cover crossing.

In response to surrounding residents' requests, the study was extended to include acoustic analyses to test for low-frequency sound transmitted to neighboring residences—acoustic waves that would be perceived as a vibration. The study concluded that noise from the mine did not transmit low-frequency sound to nearby residences. These results would also be expected to apply to mining in the Project Area and equipment and vehicle operation through the low-cover crossing.

A supplemental vibration study (CDS 2014) addressed adjacent landowner concerns that measurements in the 2013 noise and vibration study were made too far from production activity and covered too short of a time span. This supplemental study conducted noise and vibration measurements for 19 days continuously on the surface immediately above the active mining area where two continuous miners operated one or two shifts per day throughout the test period (CDS 2014). This study concluded that any vibration or noise attributable to mining activity was well below the threshold of human perception. The typical high levels reported were at or below one-quarter of the perception limit. These results would also be expected to apply to mining in the Project Area.

3.4.4.2 Environmental Effects

The noise and vibration effects of the Proposed Action would be associated with mining and loading equipment operating at the mine's surface facilities and underground as well as from semi-trucks transporting coal along CR 120. Temporary noise effects would also occur from heavy equipment operation during construction of the low-cover crossing in The Gulch. A total of approximately 20 acres would be disturbed by the Project over the life of the mine. This would include 10 acres for construction of the low-cover crossing at the outset of the Project and 10 acres cumulatively for all other dispersed surface disturbances of variable sizes that would occur over the life of the mine. The affected area for noise and vibration focuses on the sensitive receptors or residences that have identified noise and vibration issues during scoping.

Effects of Alternative A – Proposed Action

Direct and Indirect Effects

Noise

Due to an adjacent landowner's concerns about noise and vibration from the existing mining operations, measures included in Design Features such as installing dampers on the ventilation fan, reducing alarm sounds to the lowest level required to meet safety and legal standards, using modified load-out procedures to minimize the need for "back-up" warning alarm signals, and eliminating mining within 300 ft of existing residences have been implemented to decrease noise and vibration effects. Similar levels of impacts would be reasonably expected to occur from underground mining in the LBA. The same modified load-out procedures to reduce the need for "back-up" warning alarm signals and eliminating mining within 300 ft of existing residences at the existing mine would be implemented for mining in the LBA to decrease noise and vibration effects.

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Construction of the low-cover crossing through The Gulch would create temporary noise effects during the approximate six month associated construction timeframe. Construction of the crossing would involve operation of 2 haul trucks, 2 excavators, a frontend loader, a small bulldozer, a water truck, and a Skid Steer, not necessarily at the same time, during daylight hours. Noise generating components would include the engine, cooling fan, air intake, exhaust, transmission, tires, tracks, hydraulics and moving mechanical parts. Direct noise impacts may include local disturbance of wildlife. These effects would be expected to range from minor to moderate and would be temporary in nature. Noise from heavy equipment operation may also be audible at times and at some residences in the Vista de Oro Subdivision. Of the equipment used for the construction of the crossing, the average noise level, measured at 50 ft, is between 76 and 82 dB. The inverse square law describing the attenuation of noise over distance states that for each doubling of distance from a point source, the sound pressure level decreases by approximately 6 dB. Given the nearest home to the location of the low-cover crossing (approximately 3,300 ft), the sound level of the loudest machinery used in the cover construction would attenuate from 82 dB to 45 dB. It would likely be lower than this due to surrounding topography and vegetation further attenuating the noise produced. Therefore, the noise effects would be negligible to minor and temporary.

In addition, daily passage of three construction worker vehicles, and infrequent passage of a water truck for dust control and equipment maintenance vehicles, to and from the construction site along the proposed access route would create temporary and intermittent noise in the immediate area of the access route. Direct impacts may include local disturbance of wildlife. These effects would be expected to range from minor to moderate and would be temporary in nature.

Once the construction of the low-cover crossing is completed, the subsurface entries would be buried by at least 4 ft of compacted alluvium in the center of the Gulch where the dry streambed is incised into the Gulch. To the southeast of the intermittent streambed, the compacted alluvium cover would thicken progressively but unevenly and at the point of intersection with the coal seam outcrop on the southeast flank of the Gulch, would be approximately 25 ft deep. Moving west from the intermittent streambed, the compacted alluvium cover would thicken more quickly and evenly than on the southeast side and reach approximately 50 ft thick on the northwest flank of the Gulch at the intersection of the entries with the coal outcrop. Once the crossing is being utilized, noise from the passage of mining equipment and vehicles, and operation of the conveyor system through the buried crossing, would be attenuated by the compacted cover material. Direct noise effects would be negligible to minor and limited to directly above the buried crossing entries.

The principal noise sources related to the continued mining operation of the surface facilities include the mine ventilation fan, conveyors, and warning alarm signals of load-out equipment. Noise from mining operations were determined (CDS 2014) to result in no impact. Mitigation of mine-site noise is not required.

Indirect noise impacts are associated with the truck-traffic on CR 120 from coal transport. There are no published data measuring the noise or vibration associated with coal transport, but residents along CR 120 have reported noise and vibration levels that adversely affect their quality of life. State statute set noise limits for residential properties of 55 dBA daytime (7:00 a.m. to 7:00 p.m.) and 50 dBA nighttime at

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25 ft from the property line. All haul trucks measured had noise levels below 86 dBA, a cited limit established by the State of Colorado. All noise measurements collected and/or reviewed by the applicant and LPC noise consultants agreed with the outcome of the noise monitoring results.

Overall, it was determined that following GCCE's implementation of noise mitigations (i.e., installation of noise barriers), noise impacts would be negligible to minor, lasting for the duration of mining activities.

Vibration

Vibration studies did not find vibration to be above detectable levels at locations directly above the underground mining equipment and the surface facilities (CDS 2013). The peak vibration recorded at area residences was approximately eight times lower than the threshold for human perception (0.03 inches/second) and approximately 14 times lower than vibrations which could cause hairline cracking in historic plaster walls (minimal). These same levels of impacts would be reasonably expected to occur during mining of the Project Area, operation of the conveyor system and passage of mining equipment through the low-cover crossing.

In response to continued resident comment, GCCE took measurements on the ground surface directly above the continuous miner equipment—approximately 300 ft above the continuous miner. No induced vibrations were recorded. Vibrations drop below the level detectable by human perception within 25 ft of this type of equipment (Aimone-Martin Associates 2015). Based on this information, it was determined that mining operation vibrations do not pose a significant impact from the Project, and therefore do not require further mitigation.

Cumulative Actions and Effects

The CIAA for noise is the Project Area, including the length of CR 120 to SH 140 and an approximately 1-mile buffer around the area. Cumulative noise and vibration effects for the Proposed Action would be related to changes in mining location in addition to equipment use and number of truck trips, which would remain generally the same. These effects could be additive if additional use of the road system increases through reasonably foreseeable activities such as oil and gas development, additional residential development, or increased ranching and agricultural activities. However, recent implementation of design features, such as constructing noise barriers and paving segments of road, has reduced cumulative noise impacts to nearby residences.

Noise and vibration effects for the Proposed Action consider equipment use and truck trips for the maximum allowable coal production under the current mine permit. If GCCE were to change mobile equipment or desire to increase coal production above permitted levels, it would be required to apply for a permit revision with CDRMS and the OSMRE. These agencies would evaluate the potential noise and vibration effects associated with the proposed permit changes. Therefore, the cumulative noise and vibration effects for the Proposed Action are the same as baseline levels because noise and vibration levels allowed under the current mine plan would be enforced. Cumulative effects would be long term and negligible to minor.

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Effects of Alternative B – No Action Alternative

Direct and Indirect Effects

Under the No Action Alternative, the LBA would not be offered for competitive lease sale by BLM, there would be no mining plan modification to be considered and approved by OSMRE and federal coal reserves in the LBA and new private reserves would not be recovered. The King II Mine would continue to operate as allowed by the current mine plan until the existing coal reserve is mined out, and noise impacts would be the same as those under the current operation. Under this alternative, the King II Mine would shut down around 2022. When coal reserves are completely depleted, there would be no coal-hauling truck traffic or associated noise and vibration along CR 120

Cumulative Actions and Effects

Cumulative impacts under the No Action Alternative would be the same as under the Proposed Action but would be limited to the current lease and permit areas.

3.4.5 Resource Issue – Wetlands/Waters of the U.S.

What would be the effects of the alternatives on identified wetlands and WOTUS?

3.4.5.1 Affected Environment

In general, potential wetlands in the Project Area are generally associated with manmade ponds and intermittent streams that may support wetland vegetation. Common wetland and riparian plant species that would be expected to occur in the Project vicinity, especially in Alkali Gulch and Hay Gulch, include narrowleaf cottonwood (*Populus angustifolia*), narrowleaf willow (*Salix exigua*), water birch (*Betula occidentalis*), duckweed (*Lemna* spp.), rushes (*Eleocharis* and *Juncus* spp.), sedges (*Carex* spp.), bentgrass (*Agrostis* spp.), and broad leafcattail (*Typha latifolia*). Within the existing King Coal II Mine area, several impoundments along unnamed intermittent drainages have been constructed to create small, seasonal ponds that may support wetlands.

As discussed in Chapter 2, the existing King II Mine and the LBA reserve area are separated by The Gulch where most of the coal outcrops occur. Coal in the Project Area would be accessed from the West Mains of the King II Mine through a subsurface, low-cover crossing of The Gulch (**Figure 2-1**).

In October 2018, a field survey was conducted by SME Environmental, Inc. (SME) to investigate whether any potential wetlands and/or WOTUS are present in proximity to the proposed East Alkali Gulch low-cover crossing. Prior to conducting the field survey, SME conducted a desktop study of available publications and aerial images such as: USGS 7.5' topographic quadrangles, USDI National Wetlands Inventory quadrangles, U.S. Department of Agriculture National Resource Conservation Service (NRCS) soil maps, and DigitalGlobe Aerial Imagery (July 3, 2017) from the USDA NRCS SSURGO database. Per the BLM and OSMRE's request, all NWI mapped wetlands that crossed the Gulch low-cover crossing access road or that were in the vicinity of the access road were examined.

Field work was conducted by SME staff using the methodology defined in the Routine Determination procedure set forth in the U.S. Army Corps of Engineers Wetlands Delineation Manual (USACE 1987) and the Arid West Supplement (USACE 2006). Wetland boundaries were defined based on the presence of

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hydrophytic vegetation, hydric soils, and hydrologic indicators that under normal conditions would indicate wetland conditions. Where wetland conditions did not occur adjacent to surface water, the jurisdictional boundary was identified based on evidence of the ordinary highwater mark (USACE 2005). Additional detail can be found in Aquatic Resources Delineation Report, Alkali Gulch Low Crossing Project, LPC, CO (SME 2018).

The Gulch low-cover crossing access road is located in Sections 24, 25, 26, 35 and 36 of Township 35 North in Range 12 West and Sections 19 and 30 of Township 35 North in Range 11 West of the NMPM for LPC, Colorado. The East Alkali Gulch low-cover crossing survey area was defined to include the East Alkali Gulch and the surrounding forested areas approximately 1,800 ft east of De Oro Way. In general, the survey area is situated in the Middle San Juan Watershed (HUC 14080105) at approximately 7,440 ft above mean sea level. The survey area is located west of Hesperus, CO and west of the La Plata River to which The Gulch eventually drains. The total size of the survey area is 12 acres, which includes the area where the proposed East Alkali Gulch low-cover crossing would be constructed. The survey area was accessed via an unnamed dirt road off of CR 120.

The USGS map shows an intermittent tributary flowing south/southwest through the survey area to the La Plata River. However, after delineation fieldwork, it has been determined that this feature is a narrow palustrine scrub-shrub (PSS) wetland. **Table 3-7** lists the acreage of the wetlands/WOTUS classified in accordance with the Cowardin Classification System for wetlands and deepwater habitats (Cowardin et al. 1979). The boundaries of wetlands/WOTUS are depicted on **Figure 3-1**. **Table 3-8** provides a breakdown of these resources as evaluated for a Preliminary Jurisdictional Determination from the October 2018 field survey efforts.

Table 3-7. Cowardin Classification of Aquatic Resources within the Survey Area

Waters of the U.S.	Square Ft	Acres	Linear Ft
PSS Wetland	8,492	0.19	N/A
Total	8,492	0.19	N/A

Source: SME 2018

Table 3-8. Characteristics of Aquatic Resources within the Survey Area

Water Feature Name	Flow Frequency	Flows to	Preliminary Jurisdictional Determination	Rationale
Area A	Intermittent, seasonally saturated	La Plata River	Yes	Meets all three wetland parameters (i.e., vegetation, soils, and hydrology)

Source: SME 2018

As shown in **Table 3-7**, approximately 0.19 acres of PSS wetlands exist in the survey area. The PSS wetlands were dominated by narrowleaf willow with an herbaceous layer of Western wheatgrass (*Pascopyrum smithii*) and Mountain rush (*Juncus balticus*). The PSS wetland within the survey area is located within the *Umbarg Loam* soil unit (NRCS 2018). Data collected from soil transects during the field investigation

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revealed primarily clay loam/silt loam soils. The primary hydric soil indicator observed at the soil boring locations within the wetland areas was redoximorphic features (i.e., mottles) located within a dark soil matrix (F6-Redox Dark Surface). The hydrology in the survey area is sourced primarily from stormwater and snowmelt that is carried from areas of high elevation to The Gulch. The areas of high elevation (both to the east and west of the survey area) can be viewed on the USGS Thompson Park, Colo. 7.5' Topographic Quadrangle 1:24,000. The primary form of hydrology found on the site is the presence of oxidized rhizospheres within the soil.

No other wetlands or WOTUS were found to be present within the survey area. Within the Gulch, wetlands are discontinuous and patchy and contain large sections of upland swales. Data points were taken throughout the survey area where the NWI mapped wetland features crossed the access road and at other points in The Gulch to show representative wetland and upland areas and to show the discontinuous/patchy nature of the Gulch. It is to be noted that all delineated aquatic resources extend beyond the limits of the survey area; however, only the portions of aquatic resources within the survey area were delineated. Approximately 10 acres would be cumulatively disturbed for all other dispersed surface disturbances of variable sizes that would occur over the life of the mine. The locations of these disturbances are not known at this time. When additional surface disturbance is proposed by GCCE, the agencies will determine if additional surveys for wetlands and WOTUS are required.

3.4.5.2 Environmental Effects

Effects of Alternative A – Proposed Action

Direct and Indirect Effects

Construction of the Gulch low-cover crossing would take about six months and during construction, potential surface disturbing activities would occur on approximately 10 acres (with wetlands or other WOTUS comprising of less than 0.2 acre within the proposed crossing area). Site-specific clearances and permitting for impacting jurisdictional wetlands or other WOTUS, would be completed under the purview of the U.S. Army Corps of Engineers prior to commencing any site-specific improvements in areas with jurisdictional wetlands or WOTUS present. Impacts to wetlands or WOTUS would likely be authorized under Nationwide Permit #14, Access Roads. Overall, impacts to wetlands and WOTUS by the Project as a result of ground disturbance associated with the construction of the Gulch low-cover crossing would be temporary (i.e., six months) and minor as the stream bed would be re-established as closely as possible to its original configuration post construction, and topsoil would be spread over the disturbed area up to the original soil depth and surface elevation. Disturbed vegetation also would be reclaimed in accordance with the Reclamation Plan General Requirements as described in the PAP.

In addition to current wetland regulations, it has been determined that implementation of the Proposed Action would comply with the new wetlands rule currently under consideration.

Cumulative Actions and Effects

The CIAA for wetlands and WOTUS is the Project Area. Additional activities associated with mining under the Proposed Action would have the potential to cumulatively impact wetlands and WOTUS in the area. The impacts related to mining operations are minor as only infrequent small surface impacts occur associated with surface drilling and testing. Along with past, present, and reasonably foreseeable future

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actions, activities associated with mining and oil and gas development in the Project vicinity are likely to result in minor cumulative impacts to the region, due to the associated surface disturbance, reclamation of the area at the end of the life of the mine, and re-establishment of local riparian vegetative communities. Overall, cumulative impacts are expected to be minor as the ground disturbance associated with The Gulch low-cover crossing is 10 acres combined with an additional 10 acres cumulatively for all other dispersed surface disturbances of variable sizes that would occur over the life of the mine.

Effects of Alternative B – No Action Alternative

Direct and Indirect Effects

Under the No Action Alternative, the LBA would not be offered for competitive lease sale by BLM, there would be no mining plan modification to be considered and approved by OSMRE and federal coal reserves in the LBA and new private reserves would not be recovered. Therefore, no impacts to wetlands and WOTUS would occur. GCCE would continue mining within the existing federal and state mine permit areas until those coal reserves are mined out.

Cumulative Actions and Effects

Cumulative actions and effects to wetlands and WOTUS under the No Action Alternative would be less than those under the Proposed Action but would still be anticipated to be negligible, long-term cumulative effect on wetlands and WOTUS.

3.4.6 Resource Issue – Subsidence

What would be the subsidence effects of the alternatives on natural resources and land uses within the LBA and on the structural integrity of nearby residences and other structures?

3.4.6.1 Affected Environment

Subsidence is the gradual lowering of the ground surface after coal and support pillars are removed in a completed mining panel. After coal recovery, fracturing and settling of the overlying overburden may yield surface expressions of subsidence in the form of subsidence cracks and a lowering of the ground surface. At the King II Mine, the coal seam is overlain by a thick, durable sandstone layer that fractures into large blocks, minimizing void spaces. The nature of the overburden reduces the risk for surface earth movement after underground mining than would result from a less durable stratum such as siltstone or shale. Prior coal mining at the GCCE King I Mine revealed minor subsidence over 70 years of mining. At the King I Mine, surface expressions of subsidence averaged between 50 and 100 ft in length, less than 1 foot in depth, and 0.25 to 0.5 ft in width. Where these have occurred, the distance from the coal seam to the surface has ranged from 250 ft to 325 ft. The cracks themselves are vertical. Monitoring of these features by GCCE contractors determined that they filled in naturally within two seasons and have not expanded in size. Fewer than six of these subsidence features have been identified since GCCE began mining in 2004.

3.4.6.2 Environmental Effects

Effects of Alternative A – Proposed Action

Field measurements of subsidence cracks in the Mesa Verde Formation by Dunrud (1976) indicate subsidence cracks may develop through overburden thicknesses of up to 800 ft under unfavorable

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conditions. While unfavorable conditions cannot be defined exactly, they may include zones of weathered coal and overburden. Overburden thicknesses over 800 ft have been classified as having a negligible risk of surface fracturing developing. This is a conservative upper limit under normal conditions.

Roof rocks primarily consisting of strong, thick sandstones of the Mesa Verde Group would cave into the mine in larger blocks than would shale roof rocks and would reduce the height of caving above the mine workings. These sandstones would generally reduce the amount of subsidence compared to shale. Sandstones at the surface would have larger displacements and may form cracks up to 1 foot wide and 25 to 50 ft deep on steep slopes. Formation of joints and fractures on steep slopes may contribute to slope instability and susceptibility to landslides and rockfalls. The proposed mine plan for the Dunn Ranch Area LBA does not include mining under steep slopes or daylighting along the steep drainages. Implementation of the Proposed Action would result in the removal of an estimated 17 mt of coal; the anticipated maximum, LPC-permitted annual production would be approximately 1,067,040 tpy (**Section 2.4**), which would result in a long-term, negligible to minor potential subsidence effect in the Project Area. The low-cover crossing would be backfilled at the end of the life of the mine to prevent any subsidence from occurring in The Gulch.

There would be no subsidence impacts to CR 120 as none of the underground operations are beneath CR 120.

Direct and Indirect Effects

The direct effects are measured by the risk and extent of subsidence to occur in the locations and allowable mining methods for the proposed LBA and conceptual mine plan. The risk and extent of subsidence would depend upon many factors, including mine plans, coal seam thickness, geologic strata, and overburden depth. The overburden range for the Project Area is similar to the King Mine II area, ranging from 100 ft to 300 ft (GCCE 2006; NKC 1999). Assuming a coal seam thickness of 5 to 10 ft, surface lowering after retreat mining could be measurable and result in detectable surface subsidence impacts.

Based on subsidence monitoring at the King I Mine, with similar overburden thickness, mining the same seam, surface subsidence features were rarely encountered. Those observed averaged 1-foot-wide/deep and 100 ft in length (**Photo 3-1**). The features were self-healing and not discernable after 2 calendar years. Accordingly, direct impacts associated with subsidence are expected to be minor and short to long term.

As described in the 2017 EA (BLM and OSMRE 2017), the thick Cliff House sandstone provides a great deal of ground stability and generally prevents subsidence from reaching the surface after pillars are extracted during mining. Nonetheless, it is possible that subsidence could occur post mining. To determine potential impacts from subsidence, the OSMRE requires an inventory of structures, renewable resource lands and the characterization of a “worst possible consequence of subsidence.” Based on review of publicly available site-specific imagery (Google Earth 2018), the observable man-made features include structural remains, stock fences, stock ponds, and a two-track road system within the Project Area.

The two-track road system is the main infrastructure above the existing and proposed LBA, which could be damaged because of subsidence. If a surface subsidence crack were to intersect a road, it is possible that some repair of the road would be required to allow its continued use. These roads are used primarily

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by the UMU Tribe for access to rangelands, hunting, and firewood cutting. The structural remains are on an edge of the Project Area boundary and at the toe of steep slopes associated with Alkali Gulch. There are no mining panels beneath this part of the lease and therefore no impacts from subsidence would occur to the homestead structure.



Photo 3-1 The largest subsidence feature observed to have formed, located above King I Mine. It occurred in an area where soils had been stripped for a road; therefore, it is very visible. The area was pillared in 2006 and the photo was taken in 2013 after the subsidence appeared.

As presented in Chapter 2, compliance with CDRMS Regulation 2.03.7(3), Relationship to Areas Designated Unsuitable for Mining, addresses risk of subsidence from underground mining to adjacent surface property. The regulation restricts mining to an area 300 ft outside of an occupied dwelling. Furthermore, OSMRE and CDRMS typically requires that “angle-of-draw” is considered in determining a

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distance where mining is not permitted. Angle-of-draw accounts for the possibility that the effects of subsidence may extend beyond the actual extent of mining, typically figured at a 35-45-degree angle extended to the surface. No residential structures occur within the angle of draw for the proposed mining and therefore no impacts on the structural integrity of residences would occur. For added assurance, GCCE has agreed to the additional design features presented in **Appendix B**.

If subsidence cracks damage any barbed wire fence within the permit area (a fencepost could be dislodged or strands of barbed wire could be stretched and break or sag), GCCE would repair the fences without charge to the UMU Tribe or would reimburse the UMU Tribe at reasonable costs for any necessary repairs. Potential impacts to structures from subsidence would be short to long term and negligible. Subsidence cracks do not rupture in such a way that the crack would represent an opening that a person or animal could fall into to any depth.

Underground coal mining can result in subsidence of overlying rock. Cracks from subsidence extend upwards and can reach the surface. The hydrologic system, both surface and groundwater, could be altered by subsidence. Surface water conveyances could be physically altered by subsidence if elevation differentials result in grade changes and upland runoff patterns could be similarly altered. Subsidence-caused tension cracks could also result in loss of flow to or within these conveyances. Subsidence may locally affect surface soils through slight but non-uniform settling and development of tension cracks. Soil erosion has the potential for becoming accelerated in areas where surface runoff flows into the subsidence surface cracks. Subsidence may locally alter drainage patterns through slight but non-uniform settling and development of tension cracks. This could change infiltration, ponding, erosion/deposition, and runoff characteristics on a very small and local scale but would not be expected to have off-site impacts or otherwise affect streamflow or sediment regimes. Over time, tension cracks would be likely to fill and seal, particularly in the areas where soils have substantial clay components and overly shale parent materials. Similarly, as small depressions collect runoff, conveyed sediments would deposit and over time these depressions would fill, causing local topography to reach pre-subsidence uniformity.

Cumulative Actions and Effects

The CIAA for subsidence includes the Project Area, which includes the existing mine and the LBA where subsidence has the potential to occur. The cumulative impacts would be the removal of coal and minor amounts of possible subsequent subsidence. Approximately 17 mt of coal would be mined in the Project Area under the Proposed Action. This amount is approximately 0.018 percent of the estimated 9.61 billion tons (2006 estimate) in the San Juan Basin coal field. The level of coal production would depend on market demand for cement and associated coal as well as availability of economically recoverable coal reserves in the immediate area. Based on the unsuitability assessments (BLM 1985; SJNF 1983), 46,000 acres are identified as acceptable for further consideration for coal leasing within the TRFO, with an estimated reserve of 1.5 billion tons. Of this estimated reserve, it is unknown how much would reasonably be expected to be developed in the future. No other metal or mineral mines are likely to be developed in the CIAA that could result in subsidence. As such, the cumulative impacts of subsidence from these activities would be minor.

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Effects of Alternative B – No Action Alternative

Direct and Indirect Effects

Under the No Action Alternative, the LBA would not be offered for competitive lease sale by BLM, there would be no mining plan modification to be considered and approved by OSMRE and federal coal reserves in the LBA and new private reserves would not be recovered. Therefore, there would be no new subsidence impacts.

Cumulative Actions and Effects

Cumulative impacts under the No Action Alternative would be the same as under the Proposed Action but would be limited to the current lease and permit areas.

3.4.7 Resource Issue – Land Use

What would be the effects of the alternatives on other land uses within and adjacent to the LBA and the mine?

3.4.7.1 Affected Environment

Land use within the Project Area is largely dominated by agricultural, tribal, and transportation uses. In general, the surrounding area is being mined for coal, and those areas that are not being mined are left relatively undeveloped and have no current use or land management due to the remote location. There are no commercial areas within the vicinity of the Project Area. The cultural history of the area is discussed in **Section 3.4.3**, Cultural Resources. The King I Coal Mine began operation in 1938 at its current location in Hesperus, Colorado, approximately two miles northeast of the King II Mine. The King II Mine has operated from its current location since the surface operation and portal were constructed in 2007. A detailed description of the King II mining operation, including transport and support facilities, can be found in Chapters 1 and 2 of this EA. Surface ownership includes a combination of federal land managed by the BLM, as well as private and UMU Tribe owned fee restricted lands, as shown on **Figure 1-2**. **Table 3-9** provides the acres within the Project Area by surface jurisdiction.

Table 3-9. Project Area Surface Jurisdiction

Landowner	Size (Acres)	% of Project Area
UMU Tribe	2,103	84%
Private	363	14%
BLM	47	2%
Total	2,513	100%

Agricultural Uses

A total of 2,103 acres (84 percent) of the Project Area occur within an area owned by the UMU Tribe as tribal ranch properties, specifically Hay Gulch ranch properties. Cattle and horse grazing and fencing are evident in the Project Area; albeit usage is apparently not intensive, and no livestock were observed during any of the ground investigations completed in 2015 and 2016 associated with the King II Mine Federal Coal Lease (COC-62920) Modification and Federal Mine Permit (CO-0106A) Revision and Renewal

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Environmental Assessment. The land within existing OSMRE CO-0106C permit area and LBA area are undeveloped and have no current use or land management. Along CR 120, there are mostly fenced pastures for hay production and grazing for livestock and horses.

There are no prime or unique farmlands in the Project Area (USDA/NRCS 2015) that would be affected by mining operations or road improvements in the Project Area.

Forest Management

Timber resources in the Project Area include species such as piñon pine, ponderosa pine, juniper, and Gambel oak. Project Area forest resources are managed by the UMU Tribe. The UMU Tribe does not currently have a forest or Integrated Natural RMP for the reservation or for their private ranch lands.

Recreation

There are no public recreational activities available in the Project Area. Access to UMU Tribe privately owned lands is by Tribal permit only. The UMU Tribe privately owned lands are likely utilized by a small number of tribal members for seasonal hunting.

Oil and Gas Development

No oil and gas development occurs within the Project Area. Current oil and gas development is centered on drilling locations to the east and south of the Project Area in the San Juan Basin. The nearest current oil and gas wells are approximately 4 miles east of Hay Gulch.

BLM and OSMRE are unaware of other conflicting land uses that would eliminate coal deposits from further consideration for subsurface leasing on surface lands within the Project Area.

3.4.7.2 Environmental Effects

Effects of Alternative A – Proposed Action

As there are no prime or unique farmlands nor oil and gas development within the Project Area, these land uses are not further analyzed below.

Direct Effects

A total of approximately 20 acres would be disturbed by the Project over the life of the mine. This includes 10 acres for construction of the low-cover crossing at the outset of the Project and 10 acres cumulatively for all other dispersed surface disturbances that would occur over the life of the mine. There would be no direct impacts to rangeland health or fencing on UMU ranch properties as a result of granting the coal mine lease. It is possible that subsidence could damage a UMU range fence. According to the Surface Use Agreement between the UMU and GCCE, this potential is mitigated by commitments within the agreement. There would be no surface impacts to BLM or federally administered public lands. There may be short-term minor impacts associated with temporary fence removal and replacement should temporary road improvements encroach on existing fence lines.

Indirect Effects

No indirect impacts to rangeland health or to Standards for Public Land Health are expected as a result of issuing a new federal coal lease. No changes or long-term impacts are expected to grazing and farming as a result of granting the coal mine lease.

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By the terms of GCCE's Surface Use Agreement with the UMU Tribe, no trees may be cut without the express authorization of the UMU Tribe. Therefore, there would be no change or impacts to forest resource management in the Project Area as a result of issuing a new federal coal lease.

In accordance with the Surface Use Agreement, GCCE is required to coordinate access to UMU Tribe privately owned lands with the Tribe in order to avoid and/or minimize potential impacts to Tribal members seasonally hunting on the subject ranch properties. Accordingly, negligible to no impacts are expected to private/tribal recreational opportunities on UMU Tribe privately owned lands in the Project Area.

Cumulative Actions and Effects

Resources not expected to be impacted by the Proposed Action are not carried through the cumulative impact assessment. As such, no CIAA was developed for the land use resource issue. However, in general, agricultural uses and ranching and livestock production are anticipated to continue in the area. In addition, the impacts of oil and gas developments, as well as other resource management actions, were addressed in the RMP/FEIS based on an RFD scenario of approximately 2,950 new wells in the next 15 years. Only 22 new wells were approved in 18 months after the 2015 RMP was signed. This represents an average of 1.2 new wells every month, which is only 7 percent of the RFD's predicted monthly average.

Although the cumulative surface disturbance would be greater than the proposed new disturbance from the Project, it still would be a small increment of the vast acreage of public lands in the Project vicinity and would have minimal effect on land uses displaced by cumulative actions.

Effects of Alternative B – No Action Alternative

Direct Effects

Under the No Action Alternative, the LBA would not be offered for competitive lease sale by BLM, there would be no mining plan modification to be considered and approved by OSMRE, and federal coal reserves and new private reserves in the LBA would not be recovered. Therefore, no direct impacts to other land uses within and adjacent to the LBA and the mine would occur.

Indirect Effects

Indirect impacts to other land uses within and adjacent to the LBA and the mine would not occur as no mining plan modification would be considered and no federal coal reserves in the LBA and no new private coal reserves would be recovered as a result of the federal coal lease not being issued. GCCE would continue mining within the existing federal and state mine permit areas until those coal reserves are mined out.

Cumulative Actions and Effects

Cumulative actions and effects to land use under the No Action Alternative would be less than those under the Proposed Action but would still be anticipated to be negligible, long-term cumulative effect on land uses

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CHAPTER 4 LIST OF PREPARERS

4.1 INTRODUCTION

The following people or agencies were consulted during the creation of this EA:

- OSMRE – Co-lead agency
- BLM – Co-lead agency
- Colorado DRMS – Cooperating Agency
- LPC – Cooperating Agency
- GCCE – Project Proponent
- Stantec Consulting - Preparer

4.2 AGENCY

BLM TRFO and Colorado State Office management and staff as well as OSMRE Western Region Office management and staff who participated in the EA process are listed below in **Table 4-1**.

Table 4-1. Agency Personnel

Name	Title
OSMRE	
Marcello Calle	Manager Program Support Division
Mychal Yellowman	Indian Program Branch Manager
Gretchen Pinkham	NEPA Specialist
Paul Clark	Permit Coordinator/Hydrogeologist
Jeremy Illif	Archeologist
Ed Vasquez	Biologist
Roberta Martinez-Hernandez	Air and Climate Change
Elizabeth Schaeffer	NEPA Specialist
BLM	
Connie Clementson	TRFO Field Office Manager
Chris Krassin	TRFO Assistant Field Manager, Minerals and Lands
Jamie Blair	TRFO Geologist
Helen Mary Johnson	TRFO Hydrologist
Doug Siple	COSO Mining Engineer
Gina Phillips	NEPA Specialist
Jessica Montag	Socioeconomic Specialist
Chad Meister	COSO Air Quality Specialist
Nate West	TRFO Biologist
Jeff Christenson	TRFO Recreation Specialist
Bruce Bourcy	TRFO Archaeologist

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4.3 GCCE PERSONNEL

Personnel associated with GCCE who contributed to this EA are listed in **Table 4-2**.

Table 4-2. GCCE Personnel

Name	Purpose
Sarah Vance	Mine Operations and Planning
Luis Chavez	Mine Operations and Planning
Chris Dorencamp	Mine Operations and Planning
Tom Bird	Mine Operations and Planning
Jordan McCourt	Mine Operations and Planning

4.4 NATIVE AMERICAN TRIBES

Tribes contacted during the development of this EA are listed in **Table 4-3**.

Table 4-3. Native American Tribes Contacted

Tribe	Tribe
Jicarilla Apache Nation	Pueblo of San Felipe
Kewa Pueblo	Pueblo of Sandia
Navajo Nation	Pueblo of Santa Ana
Ohkay Owingeh	Pueblo of Santa Clara
Pueblo de Cochiti	Pueblo of Taos
Pueblo de San Ildefonso	Pueblo of Tesuque
Pueblo of Acoma	Pueblo of Zia
Pueblo of Isleta	Southern Ute Tribe
Pueblo of Jemez	The Hopi Tribe
Pueblo of Laguna	Ute Indian Tribe (Uintah and Ouray Reservation)
Pueblo of Nambe	Ute Mountain Tribe
Pueblo of Picuris	Ysleta del Sur Pueblo
Pueblo of Pojoaque	Zuni Tribe of the Zuni Reservation

4.5 THIRD-PARTY CONTRACTOR

The third-party contractor (Stantec Consulting) personnel who contributed to the development of this EA are listed in **Table 4-4**.

Table 4-4. Third-party Contractor Personnel

Name	Purpose
Doug Koza	Project Manager
Neil Lynn	Deputy Project Manager/Biologist
Bob Berry	Water Resources
Eric Clark	Air Resources
Jenni Prince-Mahoney	Cultural Resources
Stephanie Lauer	Subsidence, Noise
Nicole Lynass	Wetlands, Land Use
Chuck Hermann	Wetlands

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CHAPTER 5 REFERENCES, ACRONYMS, AND GLOSSARY

5.1 REFERENCES

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PRELIMINARY ENVIRONMENTAL ASSESSMENT

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PRELIMINARY ENVIRONMENTAL ASSESSMENT

5.2 ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
APE	Area of Potential Effect
ASLM	Assistant Secretary Land and Minerals
BLM	Bureau of Land Management
BTU	British thermal unit
CARMMS	Colorado Air Resources Management Modeling study
CDPHE	Colorado Department of Public Health and Environment
CDRMS	Colorado Division of Reclamation Mining and Safety
CDS	CDS Environmental Services LLC
CEQ	Council on Environmental Quality
CFR	Code of Regulations
cfs	cubic ft per second
CMM	coal mine methane
CO ₂	carbon dioxide
CY	cubic yards
dB	Decibel
dBA	A-weighted decibels
EA	Environmental Assessment
EDI	Engineering Dynamics, Inc.
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
FLPMA	Federal Land Policy Management Act of 1976
FONSI	Finding of No Significant Impact
ft	Feet
GCC	GCC of America
GCCE	GCC Energy, LLC
GHGs	greenhouse gases
gpm	gallons per minute
Hg	Mercury
km	Kilometer
LBA	Lease by Application
LPC	La Plata County
LUP	Land Use Plan
mg/L	milligram per liter
MLA	Mineral Leasing Act of 1920
MSHA	Mine Safety and Health Administration
mt	million tons
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act

PRELIMINARY ENVIRONMENTAL ASSESSMENT

NHPA	National Historic Preservation Act
NMPM	New Mexico Principal Meridian
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places
O ₃	Ozone
OEM	Office of Energy Management
°F	degrees Fahrenheit
OSMRE	Office of Surface Mining Reclamation and Enforcement
PaleoWest	PaleoWest Archaeology
PAP	Permit Application Package
PM ₁₀	particulate matter 10 microns
PSD	Prevention of Significant Deterioration
PSS	palustrine scrub-shrub
RFD	reasonably foreseeable development
RIA	Road Improvements Agreement
RMP	Resource Management Plan
SEAS	Stratified Environmental and Archaeological Services
sh	state highway
SHPO	State Historic Preservation Office
SMCRA	Surface Mining Control and Reclamation Act of 1977
SME	SME Environmental, Inc.
SO ₂	sulfur dioxide
SWCA	SWCA Environmental Consultants
T&E	threatened and endangered
TDF	tire derived fuel
TDS	Total Dissolved Solids
the Gulch	East Alkali Gulch
tpy	tons per year
TRFO	Tres Rios Field Office
TRR	Technical Resource Report
UMU	Ute Mountain Ute
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
Wave	Wave Engineering, Inc.
WOTUS	Waters of the U.S.
µg/m ³	micrograms per cubic meter of air

PRELIMINARY ENVIRONMENTAL ASSESSMENT

APPENDIX A

Figures

Figure 1-1

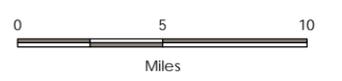
Regional Location Map

Client/Project
GCCE King II Mine Dunn Ranch Area
Lease By Application Project

Project Location: La Plata County, CO. Prepared by: JSB 2018-01-05
Technical Review by: NL 2018-01-05
Independent Review by: DK 2018-01-05

Last Modified: November 07, 2018

-  Dunn Ranch Area Lease By Application
 -  GCC King II Mine Federal Permit CO-0106C
 -  GCC King II Mine CDRMS Permit Area
 -  Coal Haul Route
- Land Ownership**
-  Bureau of Land Management
 -  U.S. Forest Service
 -  National Park Service
 -  Indian Reservation
 -  Ute Mountain Ute Fee Restricted
 -  Bureau of Reclamation
 -  State
 -  Local
 -  Private



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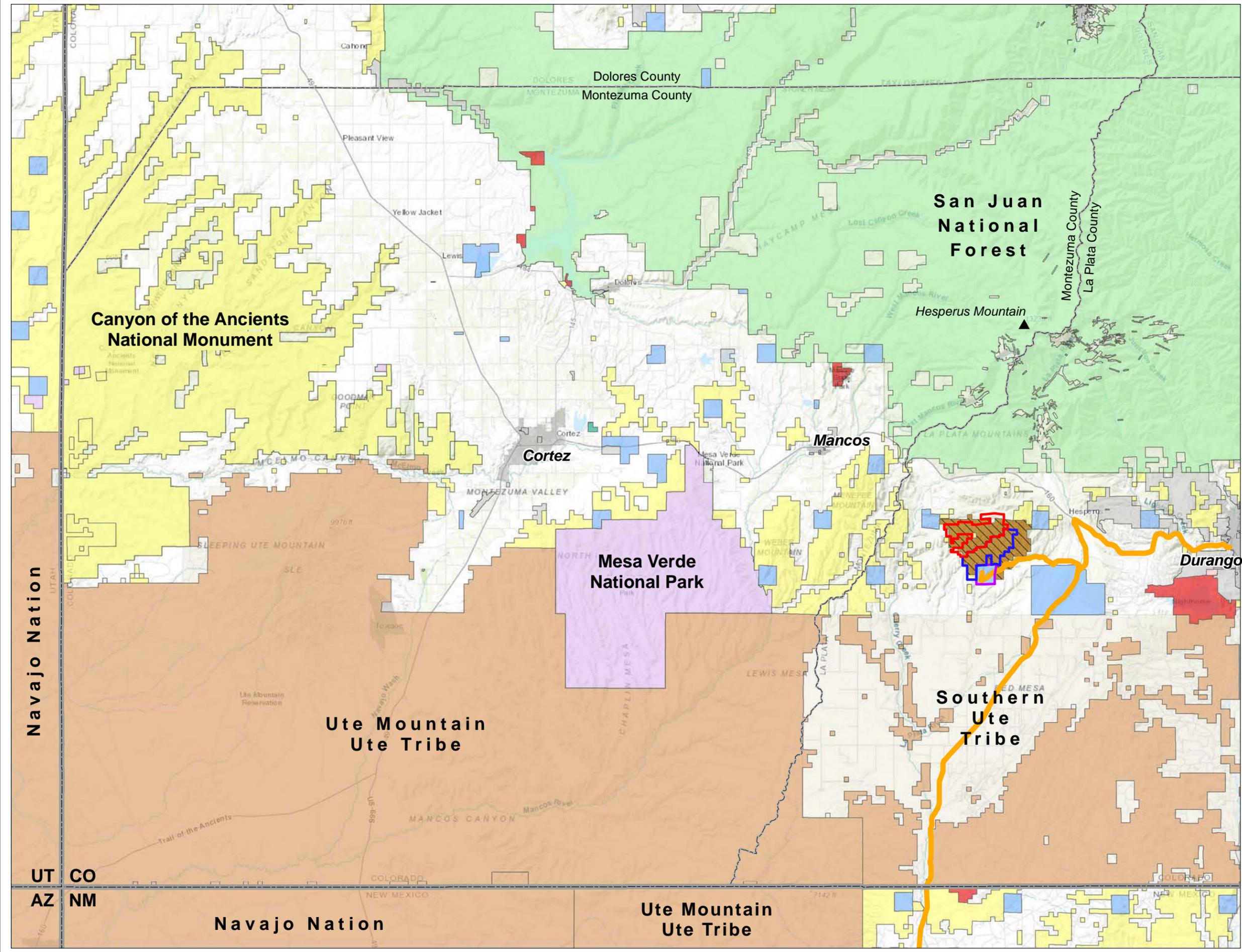


Figure 1-2

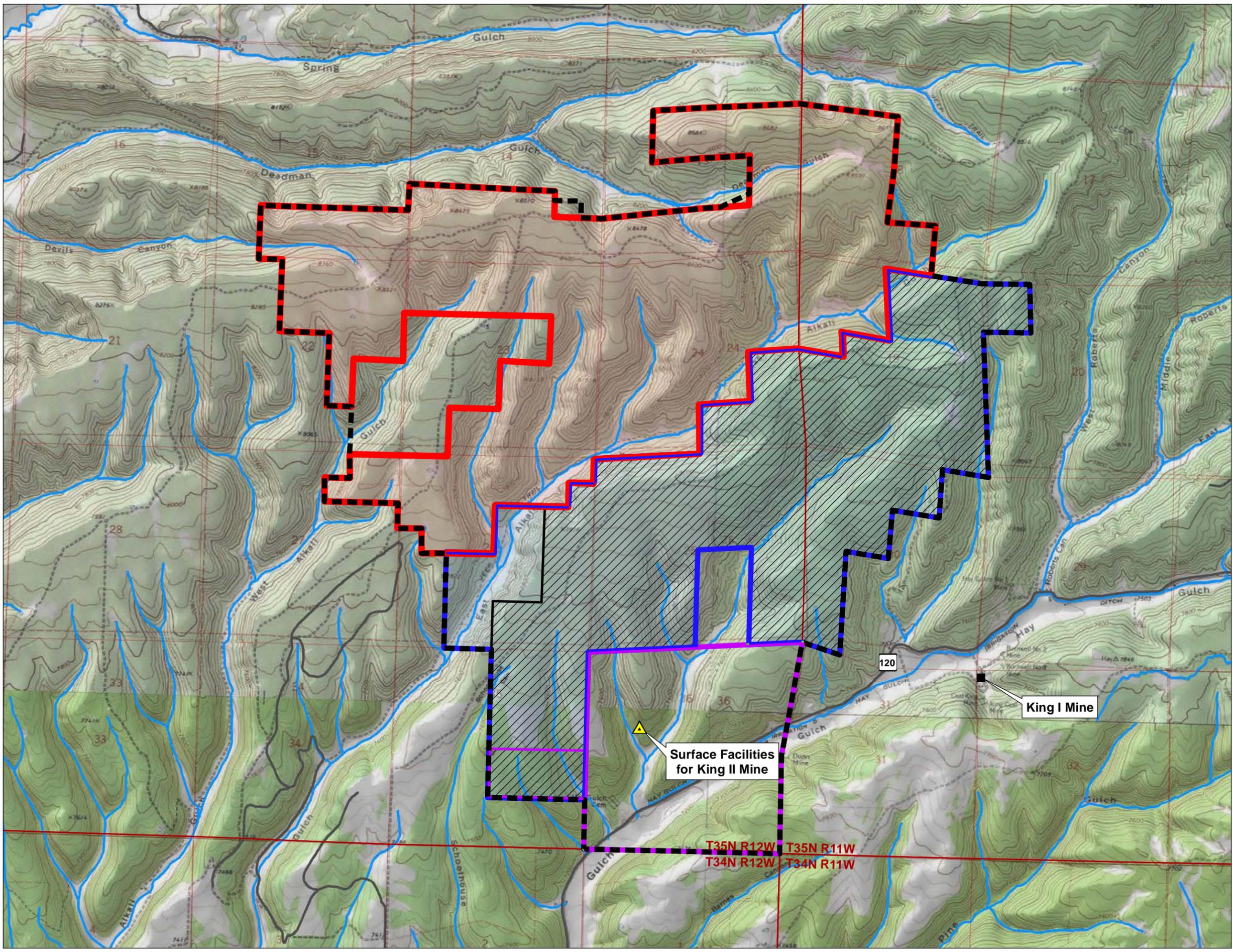
Title
Dunn Ranch Area LBA Location and Project Area

Client/Project
GCCE King II Mine Dunn Ranch Area Lease By Application Project

Project Location: La Plata County, CO. Prepared by: JSB 2018-01-05
Technical Review by: NL 2018-01-05
Independent Review by: DK 2018-01-05

Last Modified: January 09, 2019

-  Project Boundary
-  Dunn Ranch Area Lease By Application
-  GCC King II Mine Federal Permit CO-0106C
-  GCC King II Mine CDRMS Permit Area
-  Federal Lease COC-62920
-  Paved Road
-  Watercourse/Drainage



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Figure 1-3

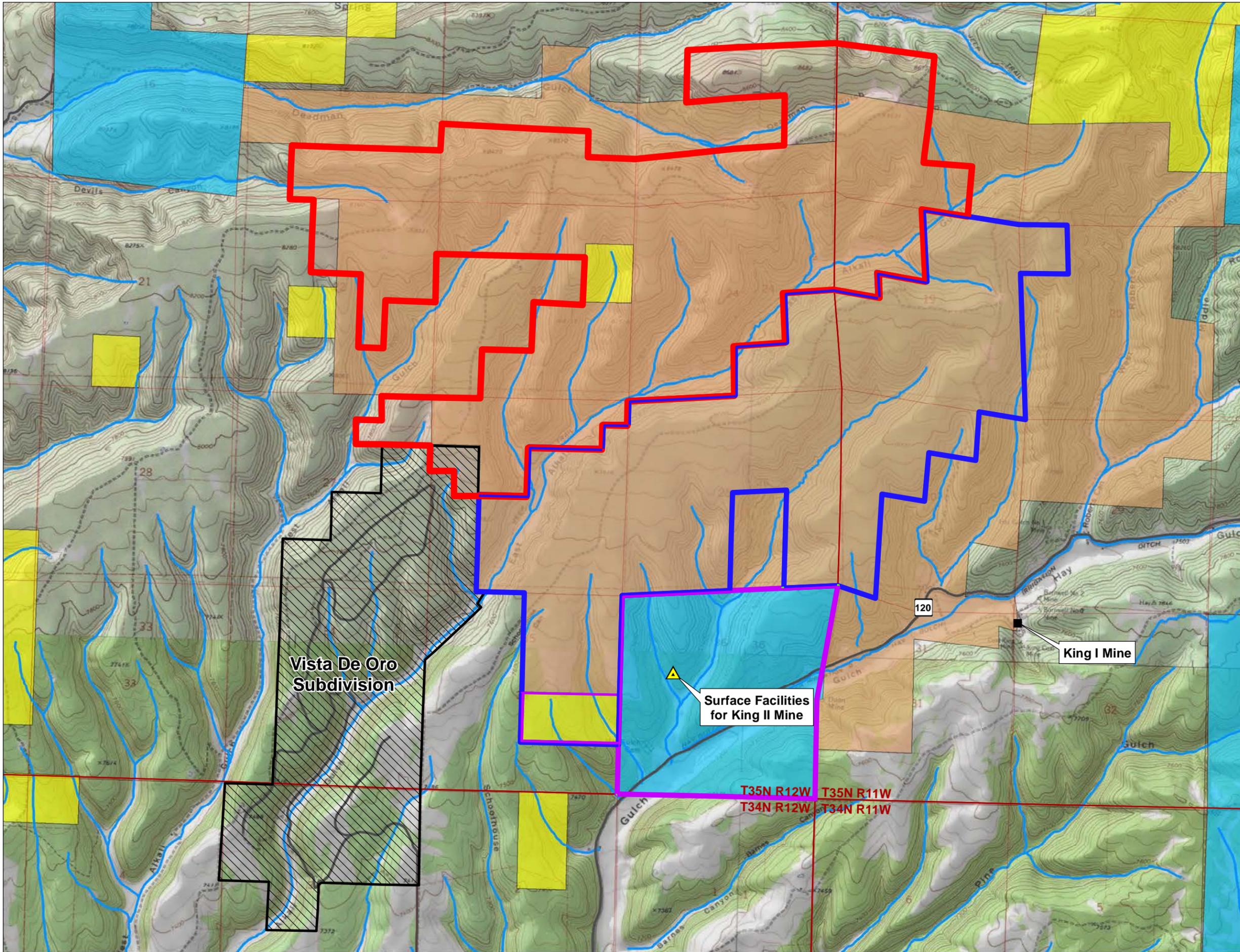
Title
Surface Ownership

Client/Project
GCCCE King II Mine Dunn Ranch Area
Lease By Application Project

Project Location: La Plata County, CO. Prepared by: JSB 2018-01-05
Technical Review by: NL 2018-01-05
Independent Review by: DK 2018-01-05

Last Modified: January 09, 2019

-  Dunn Ranch Area Lease By Application
 -  GCC King II Mine Federal Permit CO-0106C
 -  GCC King II Mine CDRMS Permit Area
 -  Paved Road
 -  Watercourse/Drainage
- Land Ownership**
-  BLM
 -  State
 -  Ute Mountain Ute Fee Restricted
 -  Private
 -  Vista De Oro Subdivision



Miles
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(At Original document size of 11x17)



Figure 1-4

Title

Coal Ownership

Client/Project

GCCE King II Mine Dunn Ranch Area
Lease By Application Project

Project Location:

La Plata County, CO.

Prepared by: JSB 2018-01-05

Technical Review by: NL 2018-01-05

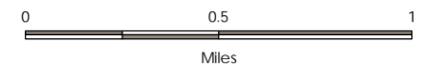
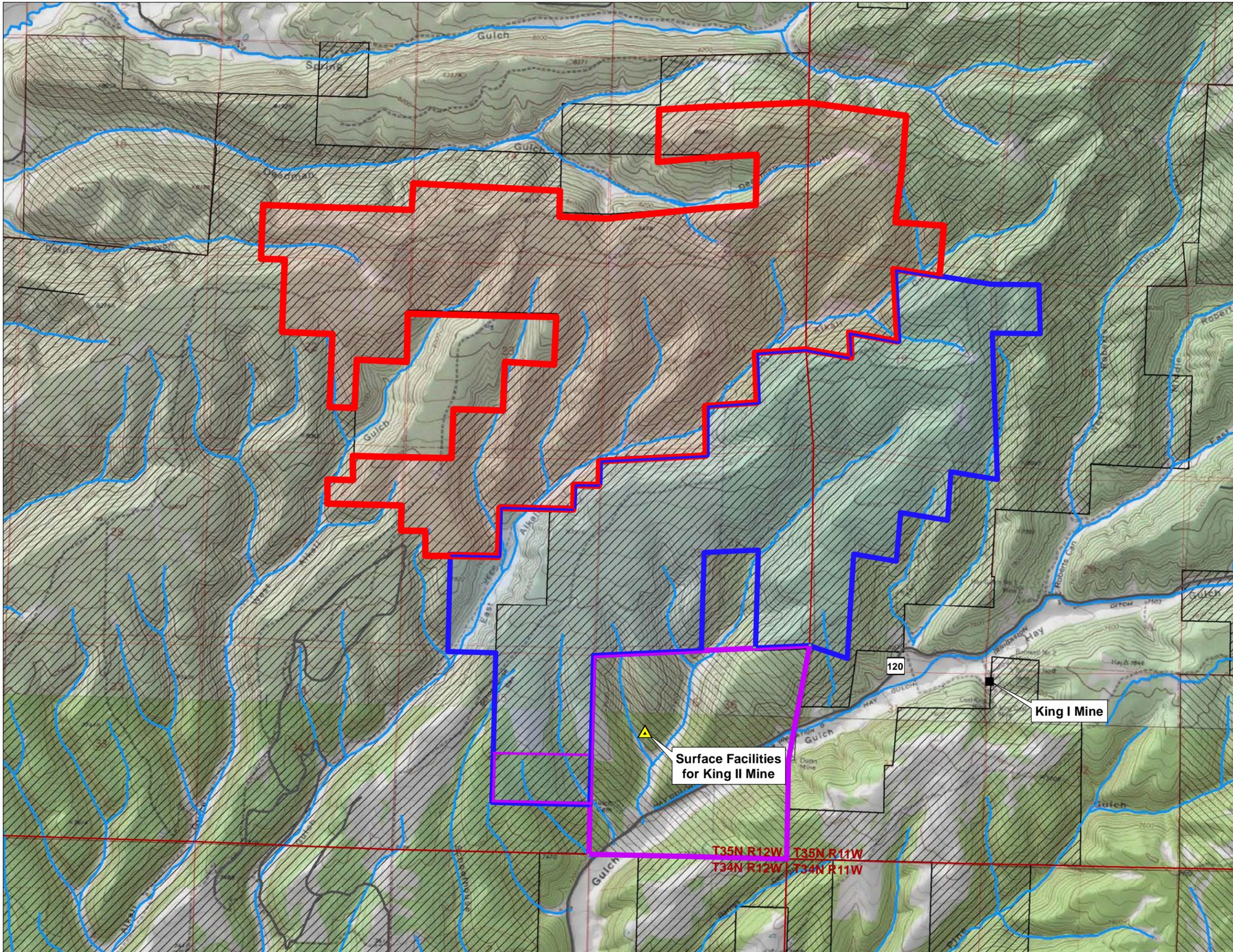
Independent Review by: DK 2018-01-05

Last Modified: January 09, 2019

-  Dunn Ranch Area Lease By Application
-  GCC King II Mine Federal Permit CO-0106C
-  GCC King II Mine CDRMS Permit Area
-  Paved Road
-  Watercourse/Drainage

Coal Ownership

-  Federal
-  State
-  Private



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(At Original document size of 11x17)



Figure 2-1

Title
Proposed Low Cover Crossing Surface Disturbance and Access Route

Client/Project
GCCE King II Mine Dunn Ranch Area
Lease By Application Project

Project Location:
La Plata County, CO. Prepared by: JSB 2018-01-05
Technical Review by: NL 2018-01-05
Independent Review by: DK 2018-01-05

Last Modified: January 09, 2019

-  Dunn Ranch Area Lease By Application
-  GCC King II Mine Federal Permit CO-0106C
-  GCC King II Mine CDRMS Permit Area
-  Proposed Low Cover Crossing Access Route
-  Access Mains
-  Existing Federal Lease Area
-  Proposed Low Cover Crossing Surface Disturbance Area
-  King II Mine Workings
-  Paved Road
-  Watercourse/Drainage
- Land Ownership**
-  Bureau of Land Management
-  Ute Mountain Ute Fee Restricted
-  State
-  Private

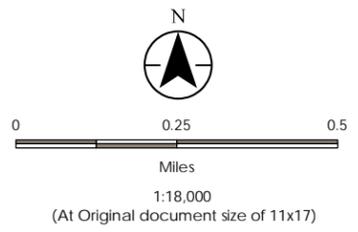
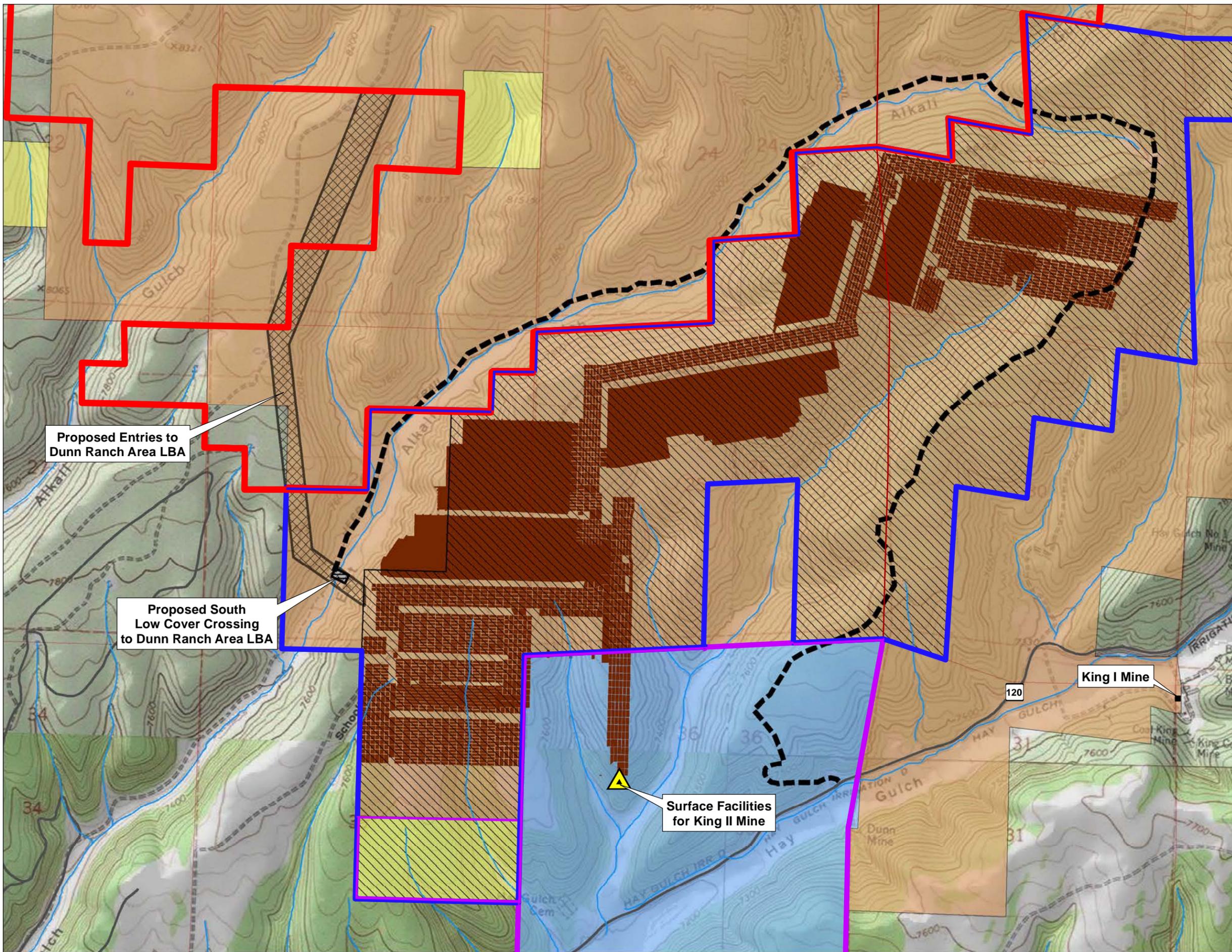


Figure 2-2

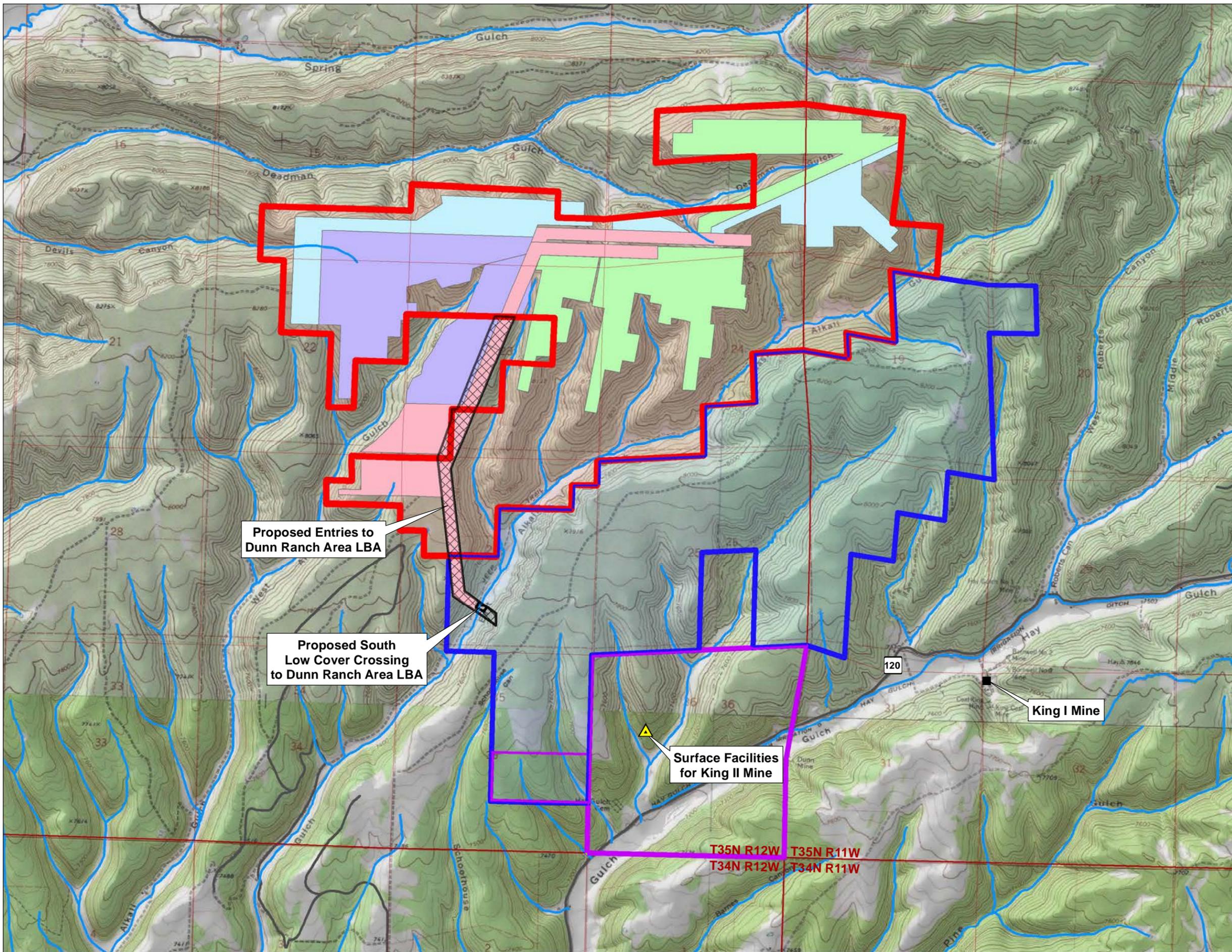
Title
Dunn Ranch Area LBA
Conceptual Mine Plan

Client/Project
GCCCE King II Mine Dunn Ranch Area
Lease By Application Project

Project Location:
La Plata County, CO. Prepared by: JSB 2018-01-05
Technical Review by: NL 2018-01-05
Independent Review by: DK 2018-01-05

Last Modified: January 09, 2019

-  Dunn Ranch Area Lease By Application
 -  GCC King II Mine Federal Permit CO-0106C
 -  GCC King II Mine CDRMS Permit Area
 -  Proposed Low Cover Crossing
Surface Disturbance Area
 -  Paved Road
 -  Watercourse/Drainage
 -  Access Mains
- Conceptual Mine Plan Sequence**
-  1-6 Years
 -  7-12 Years
 -  13-15 Years
 -  16-22 Years



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Figure No.

Figure 3-1

Title

East Alkali Gulch Wetland Survey Area

Client/Project

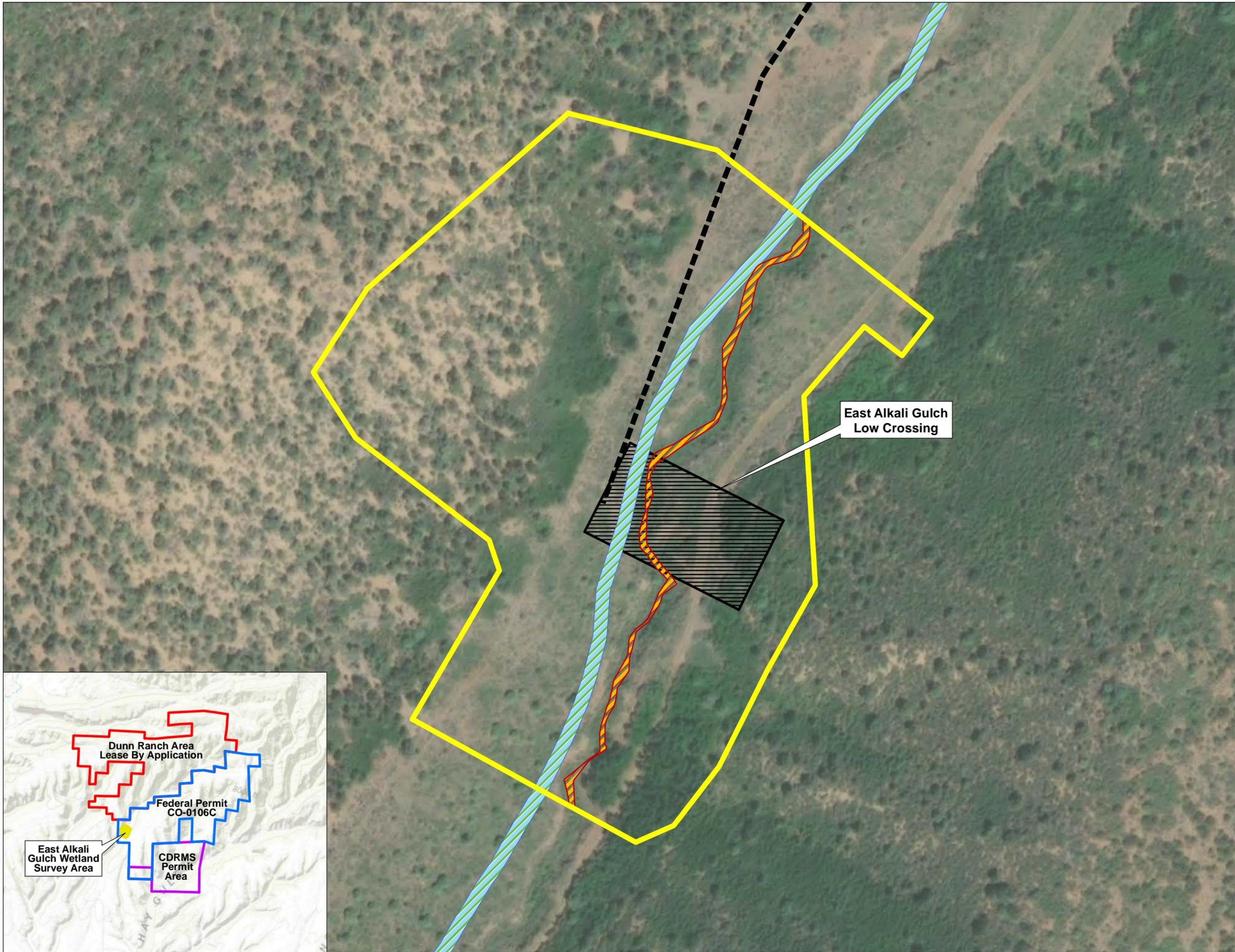
GCCE King II Mine Dunn Ranch Area
Lease By Application Project

Project Location:
La Plata County, CO.

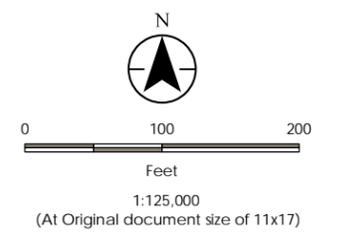
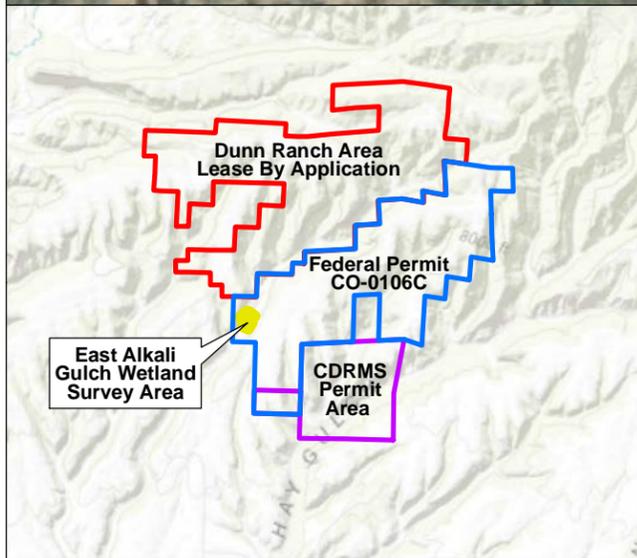
Prepared by: JSB 2018-11-19
Technical Review by: xx xxxx-xx-xx
Independent Review by: xx xxxx-xx-xx

Last Modified: November 19, 2018

-  Wetland Survey Area
-  Field-Delineated Wetlands
-  NWI Wetlands
-  Proposed Low Cover Crossing Access Route
-  Proposed Low Cover Crossing Surface Disturbance Area



East Alkali Gulch
Low Crossing



PRELIMINARY ENVIRONMENTAL ASSESSMENT

APPENDIX B

Design Features

PRELIMINARY ENVIRONMENTAL ASSESSMENT

Surface Water

W-1. Additional surface water monitoring would continue based on the results of a “spring and seep” survey of the southern edge of East Alkali Gulch. The “A” coal seam outcrop of the Menefee formation would be monitored as well as the contact between the Menefee formation and Cliffhouse Sandstone formation. Surface water monitoring would include the following: temperature, specific conductivity, pH, oxygen reduction potential, dissolved oxygen, and flow rate.

Groundwater

G-1. GCCE has committed to replacing the existing underground water storage with aboveground water storage as part of its supplemental water supply plan. Closure of the underground water storage will further eliminate risk to groundwater and be reclaimed or recovered per requirements specified by CDRMS and the OSMRE as part of the associated mine permit. Groundwater monitoring would continue to assess water quantity and quality impacts in the Alkali Gulch alluvium from the low cover crossing. Cluster well monitoring would continue to assess influence on nearby residential water supply wells.

Subsidence

S-1. Compliance by GCCE with CDRMS Regulation 2.03.7(3), Relationship to Areas Designated Unsuitable for Mining, addresses risk of subsidence from underground mining to adjacent surface property. While this is not a typical design feature, it is highlighted here to directly address scoping issues raised by adjacent landowners. The regulation restricts mining to an area outside 300 ft of an occupied dwelling. Furthermore, OSMRE and CDRMS typically requires that “angle-of-draw” be considered in determining a distance where mining is not permitted. Angle-of-draw accounts for the possibility that the effects of subsidence may extend beyond the actual extent of mining, typically figured at a 35-45-degree angle extended to the surface. For added assurance, GCCE has agreed to the following design features:

- S-2. As an LPC LUP condition, GCCE has committed to avoiding mining activity within 600 ft measured horizontally of a dwelling without an expressed waiver in writing executed by the dwelling owner.
- S-3. GCCE has committed in its subsidence monitoring program prepared and undertaken pursuant to Rule 2.05.06(6)(c) of the Regulations of the Colorado Mined Land Reclamation Board for Coal Mining to include all dwellings within 1,000 ft measured horizontally of the mining activities.
- S-4. GCCE has agreed to measure and monitoring on a quarterly basis the static groundwater level in the wells identified within CDRMS Technical Revision-26 or as amended, and within 10 days of measuring the static groundwater post the results on a publicly accessible website.
- S-5. GCCE has committed to annual subsidence monitoring after snowmelt on UMU surface in accordance with Federal Permit CO-0106C.

Vegetation

V-1. Disturbed vegetation would be reclaimed in accordance with the Reclamation Plan General Requirements as described in the PAP.

V-2. Vegetation impacts resulting from spills or leaks would be minimized by following the mines waste management procedures. GCCE has an approved Spill Prevention, Control, and Countermeasure Plan in place.

PRELIMINARY ENVIRONMENTAL ASSESSMENT

V-3. Hay and/or straw mulch would be employed in areas where wind or water erosion is of significant concern. Such areas may include channel bottoms and hillside slopes. Any hay or straw employed would be certified as native and weed and pest free in accordance with U.S. Department of Agriculture regulations. Hay or straw mulch would be applied at a rate of two (2) tons per acre and crimped or disked into the surface of the soil. Application would be perpendicular to the predominant wind direction and/or the direction of surface water flow.

V-4. The presence of noxious weeds and plant pests would be monitored annually during the summer. Management measures would be undertaken where a single or combination of noxious weed species or plant pests would comprise or show a deleterious effect to more than ten (10) percent of the live vegetation. Further, where noxious weed species or plant pests constitute more than 25 percent relative vegetation cover in an area of 500 square ft or such area shows depredation or plant impacts of the same magnitude, such area would be identified as a patch, and subject to management measures, irrespective of the percentage of overall noxious weed cover in the mitigation area.

V-5. Noxious weeds or plant pests would be controlled by any combination of cultural, mechanical, biological, or chemical measures. Weed control measures would be developed specifically for the noxious weed species encountered and in conjunction with the local weed control district and/or the Colorado State Department of Agriculture. Where noxious weed control measures cause disturbance to the remaining vegetation, seeding or planting of desirable replacement vegetation would occur during the first normal planting or seeding season after weed control measures have been implemented.

Wildlife

WL-1. Conservation practices to significantly reduce or avoid direct and indirect effects to migratory birds and their habitats would be implemented such as: avoiding disturbance in known high quality habitats (especially concentrated nesting areas); limiting disturbances to the minimum necessary; planning disturbances to avoid habitats that are unique, rare, or in limited supply; avoiding new disturbances in large intact unfragmented habitat blocks; or planning activities seasonally to minimize disturbance or disruption to nesting and breeding periods based on species potentially affected.

WL-2. Any disturbances during the nesting season in potential or suitable habitats for migratory birds would require pre-disturbance clearance surveys conducted within 7 days prior to the disturbance to detect any newly arriving nesting birds.

WL-3. If active nests with eggs or young are located within a Project disturbance area, disturbance restrictive buffers around those nests would be implemented or projects would be delayed until all young have fledged. Buffer distances for bird species would be developed in coordination with OSMRE and the USFWS. Seasonal disturbance timing limitations would be adjusted to match the habitat types and likely species of concern for proposed activities that could impact nesting periods.

Air Quality

AQ-1. Dust generated by coal truck traffic would be minimized through a variety of measures including applying water and magnesium chloride solution to unpaved road surfaces, reducing truck speeds on unpaved surfaces, and covering coal loads to eliminate blown coal dust.

PRELIMINARY ENVIRONMENTAL ASSESSMENT

AQ-2. Until such time as the entirety of north CR 120 between SH 140 and the King II Mine is paved, GCCE would continue to treat unpaved sections of north CR 120 with dust retardant such as water and/or magnesium chloride as determined by the LPC Public Works Director.

AQ-3. GCCE would ensure that all coal trucks hauling coal from the King II Mine cover their loads prior to leaving the mine site.

AQ-4. Dust generated by surface coal handling activities is suppressed or contained by the design of processing equipment. For example, conveyors and transfer points and associated screening and crushing equipment are enclosed. The coal stockpile conveyors are discharged through stacking tubes rather than into open air. Coal is loaded into trucks with equipment designed to minimize fugitive dust emissions.

Noise

N-1. All alarm sounds would be reduced to the minimum level required to meet safety and legal standards.

N-2. GCCE would continue to use modified facility load-out procedures to reduce activation of truck backup alarms during the loading process.

N-3. GCCE would continue to solicit observations from neighbors to assist in identifying noise that has not otherwise been addressed.

N-4. Sound measurements at 50 ft from the edge of north CR 120 between State Highway 140 and King II Mine attributed to trucks hauling coal from the King II Mine shall not exceed 86 A-weighted decibels (dBA) at any time.

Public Health and Safety

PH-1. Hauling is and would continue to be suspended on Sundays to provide a day of respite for the residential uses along the chosen haul route.

PH-2. To minimize night-time hauling and associated safety (and noise) impacts, a maximum of 20 percent total haul trucks would be scheduled to run between 10:00 p.m. and 6:00 a.m. the next morning.

PH-3. To increase road safety and reduce dust, the speed limit for semi-trucks would continue to be 25 mph on gravel, and 5 mph under posted limits on pavement. GCCE is committed to ensuring that all contracted truck hauling businesses and drivers are aware of and adhere to said speed restrictions.

PH-4. To increase road safety, coal hauling trucks would continue to be prohibited from stopping or parking within the ROW along CR 120 or any other CR. Except in unforeseen circumstances or cases of emergency, the installation or removal of tire chains would not be permitted anywhere within the CR 120 ROW. GCCE would be responsible for ensuring that all contracted truck hauling businesses and drivers are aware of and adhere to said prohibitions.

PRELIMINARY ENVIRONMENTAL ASSESSMENT

PH-5. To increase road safety, GCCE would ensure that no trucks haul coal from the King II Mine anytime the permittee or the LPC Public Works Director, or his/her designee, determines that road conditions are, or would be in the near future, substandard for any reason such that continued coal hauling could create an unsafe condition for the traveling public. The permittee would resume allowing trucks to continue hauling coal from the King II Mine only after the LPC Public Works Director, or his/her designee, verifies orally or in writing that it is safe to resume hauling operations.

PH-6. GCCE shall pay an annual Maintenance Fee for their usage of CR 120. Until January 1, 2018, the Maintenance Fee shall be \$0.12 per ton of coal removed from the Mine Project. Thereafter, the Maintenance Fee shall increase yearly in accordance with increases in the Annual Construction Cost Index published by the Colorado Department of Transportation.

PRELIMINARY ENVIRONMENTAL ASSESSMENT

APPENDIX C

U.S. Fish and Wildlife Service
Concurrence Letter



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Ecological Services
Colorado Field Office
P.O. Box 25486-DFC MS 65412
Denver, Colorado 80225-0486

IN REPLY REFER TO:

TAILS: 06E24000-2019-I-0513

APR 29 2019

Memorandum

To: Gretchen Pinkam, Office of Surface Mining Reclamation and Enforcement (OSMRE), Denver, Colorado; Bureau of Land Management (BLM), Dolores, Colorado.

From: Drue DeBerry, Colorado Field Office, Ecological Services, U.S. Fish and Wildlife Service, Lakewood, Colorado.

Re: 2019 Reinitiation of Consultation for the King II Mine Expansion in La Plata County, Colorado.

The U.S. Fish and Wildlife Service (Service) received your letter on February 25, 2019, regarding your request for reinitiation of section 7 consultation on the proposed King II Mine Expansion for GCC Energy, LLC (GCCE), in La Plata County, Colorado. Additional project information was provided by your office on April 18, 2019. The previous section 7 consultation on this project (Tails 2017-I-1053; August 16, 2017) concurred with your determination that the proposed action, namely the King II Mine Expansion, may affect but is not likely to adversely affect the Rio Grande silvery minnow (*Hybognathus amarus*) and its critical habitat, greenback cutthroat trout (*Oncorhynchus clarkii stomias*), Colorado pikeminnow (*Ptychocheilus luscious*) and its critical habitat, and the razorback sucker (*Xyrauchen texanus*) and its critical habitat. The additional proposed activities under this reinitiated consultation include: 1) continuation of mining in new areas with up to 20 acres of new surface disturbance; and 2) evaluation of potential suitable habitat for the New Mexico jumping mouse (*Zapus hudsonius luteus*) and southwestern willow flycatcher (*Empidonax trailii extimus*) in these areas of new disturbance. Your letter finds that the additional activities addressed in this reinitiated consultation represent a continuation of the existing mining with no change in impacts from the previously consulted project, and the new project disturbance areas lack suitable habitat for the New Mexico jumping mouse and the southwestern willow flycatcher. These comments have been prepared under the provisions of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et. seq.).

The proposed action under this reinitiated consultation would add 2,462.07 acres of land and the underlying federal coal reserves immediately north and northwest of GCCE's existing federal lease and mine operations. The proposed project area consists mostly of split-estate federally owned coal, with a mixture of surface estate owners in an area referred to as the "Dunn Ranch"

area. Leasing these lands would result in a continuation of underground coal mining operations at the King II Coal Mine into the newly-leased lands. This increase would extend the life of the mine by approximately 22 years. The proposed action would cause approximately 20 acres of surface disturbance over the life of the mine, about half of which would be associated with the construction of a low cover crossing, which consists of an engineered, below-grade, steel-lined haulage way that would connect the existing mine to the new Lease by Application area prior to the start of mining. Access for construction of the crossing would be located on existing improved and unimproved gravel roads.

As part of the proposed action, there would be approximately 10 acres of surface disturbance located in East Alkali Gulch for construction of the low cover crossing. This area was evaluated for potential habitat for the New Mexico jumping mouse and southwestern willow flycatcher; it was determined that this area did not constitute habitat for either of these species, as provided in your attached report. No additional species were identified as potentially occurring within this area.

Conclusion

Based on the information provided in your letter, the Service finds that the additional activities addressed in this reinitiated consultation does not change our original concurrence that the proposed actions may affect but are not likely to adversely affect the Rio Grande silvery minnow and its critical habitat, greenback cutthroat trout, Colorado pikeminnow and its critical habitat, and the razorback sucker and its critical habitat. The Service agrees that additional impact areas do not provide habitat for the New Mexico jumping mouse and southwestern willow flycatcher and, therefore, the proposed action is unlikely to result in take of these species.

If any additional species that are Federally-listed, proposed for Federal listing, or candidate for Federal listing are found in the project area, if critical habitat is designated in the project area, or if new information becomes available that reveals that the action may impact such species in a manner or to an extent that was not previously considered, this office should be contacted to determine if further section 7 consultation will be required.

Please direct any questions or comments to Leslie Ellwood of this office at (303) 236-4747 or by email at leslie_ellwood@fws.gov.

Sincerely,



Drue DeBerry
Colorado and Nebraska Field Supervisor

cc: NMFO (J. Lusk)

Ref: Projects\BLM_OSMRE_King II Mine_2019_Reinitiation_FWS concur