

**GCC ENERGY, LLC**

**KING II MINE**

**OFFICE OF SURFACE MINING RECLAMATION AND  
ENFORCEMENT (OSMRE)**

**REVISED PERMIT APPLICATION PACKAGE**

**CO-0106A**



**March 2017**

**GCC Energy, LLC  
King II Mine  
6473 County Road 120  
Hesperus, Co. 81326**

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## 1. Applicant Information

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GCC Energy, Limited Liability Company (GCC)  
11783 Highway 337  
Tijeras, New Mexico 87059

Applicant Violator System (AVS) Entity Number 247004

Phone: (970) 385-4528 Fax: (970) 385-4638  
Employer Identification Number 20-2812006

Formed: Colorado April 6, 2005

Resident Agent in Colorado: Chris Dorenkamp  
6473 County Road 120  
Hesperus, Colorado 81326  
Voicemail: (970) 385-4528  
Fax: (970) 385-4638

Contact Person On-Site: Tom Bird, Manager, Coal Services

Telephone Number On-Site: (970) 385-4528 extension 6503

## 2. Executive Summary

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GCC currently holds Office of Surface Mining Reclamation and Enforcement (OSMRE) Permit CO-0106A to mine the King II mine in southwest Colorado (Section 9, Figure 9-1), by underground mining methods only, under a coal lease belonging in whole, to the United States of America (U.S.), administered by the U.S. Department of Interior, Bureau of Land Management (BLM) (copies of lease and permit documents are provided in Section 10, Appendix 10.1 [Lease and Right of Entry] and 10.2 [Licenses and Permits]). OSMRE is the regulatory authority that administers Federal Permit CO-0106A, which covers the permitted underground mining area beneath land owned by the Ute Mountain Ute Tribe (Tribe). Except for the north half of the southeast quarter of Section 35, Township (T) 35 North (N), Range (R) 12 West (W), the Tribe owns 100 percent of the surface rights to the current lease property, which overlies the BLM coal lease (COC-62920) assigned to GCC, described as follows:

T 35 N, R 11 W, New Mexico Principal Meridian (NMPM) North of Ute Line, Section 19, lots 3 to 5 inclusive, east half of the southwest quarter, and southeast quarter.

T35N, R 12 W, NMPM, North of Ute Line, Section 24, lots 1 to 3 inclusive, and southwest quarter of the southeast quarter. Section 25, lots 1, 2, W2 northeast quarter and west half. Section 26, southeast quarter of the northeast quarter, east half of the southeast quarter, southwest quarter of the southeast quarter. Section 35, northeast quarter, and north half of the southeast quarter.

Containing approximately 1,311.69 acres.

In a 2010 permit revision, an additional coal lease area owned in part by the Tribe (50 percent), Stephens (25 percent), and Dunn (25 percent), was appended to OSMRE Permit CO-0106A (Appendix 10.1). The Tribe owns 100 percent of the surface rights to this property, which overlies the coal lease assigned to GCC and is described as follows:

T 35 N, R 12 W, NMPM North of Ute Line, Section 26, east half of the southwest quarter and northwest quarter of the southeast quarter, southwest quarter of the northeast quarter.

Containing approximately 160 acres.

The surface property above these 160 acres of leased lands is not located on "Indian Trust" or "Reservation" lands, but was purchased by the Tribe from the Dunn family.

GCC's King I Mine operated since 1941 approximately two miles southeast of this lease. Workings were exhausted in January 2009 at this location, requiring a complete move to the above leases. The above leases are coterminous with a State of Colorado fee lease obtained by GCC to the south of the BLM lease (Section 9, Figure 9-1). The current BLM and fee leases and OSMRE permit area are accessed from the King II Mine's portals and underground workings constructed on the State of Colorado lease immediately to the south in T35 N, R12W NMPM, North of Ute Line, Section 36. All surface facilities and disturbance for the King II Mine extension are located on the State land, and have been permitted under Colorado Division of Reclamation, Mining and Safety (CDRMS) permit number #C-1981-035 (refer to Permit Revision number #08, approved June 19, 2006; Technical Revision Number 15 [TR-15], approved March 15, 2010; Technical Revision Number 22 [TR-22] approved July 16, 2014; Technical Revision Number 24 [TR-24], approved August 29, 2016; Technical Revision Number 25 [TR-25], approved December 17, 2015; and Technical Revision Number 26 [TR-26], approved October 20, 2016) (see Appendix 10.2 for approval notifications).

Coal is and will continue to be transported via conveyor belt to the surface facilities on State of Colorado surface lands. Coal is sorted at the surface facilities, and transported by truck to markets in New Mexico, Arizona, Texas, and Mexico. Coal refuse (underground development waste) from the King II Mine is transported to the approved refuse facility at the King I Mine located on private lands (Figure 9-2). The cumulative total acres approved for disturbance at the King I Mine and the King II Mine for 2016 was 48.59 acres; 22.89 acres of surface disturbance have been approved and constructed under the CDRMS permit to date. Disturbed areas include surface facilities for King I and II, three sediment ponds, roads, a refuse pile (gob), and exploration drill pads.

In the February 2012 OSMRE permit renewal application, additional information on drainage and road modifications within the existing mine entrance area were identified. New and modified surface actions described under that action include the following as presented on Figure 9-2:

1. Drainage ditches to divert runoff water from undisturbed areas away from disturbed areas
2. Drainage ditches to divert runoff water from disturbed areas to a sediment pond
3. Underground culverts to accommodate runoff water from new ditches or existing washes
4. Redirection or improvement of existing unimproved roads to avoid new coal mine operations
5. Placement of new culvert inlets and outlets
6. Placement of a 37,000-gallon potable water tank

Since the 5-year period of validity for the 2012 permit renewal request was scheduled to end in 2017, the permit renewal application was re-requested by GCC on December 2, 2016. Approval from OSMRE for the permit renewal is on administrative delay pending completion of National Environmental Policy Act (NEPA) analysis.

GCC proposes with this permit revision application to append the existing OSMRE permit CO-0106A to update and include activities on OSMRE-managed areas associated with:

- CDRMS Technical Revisions:
  - TR 22; exploration drilling on State of Colorado lands in Section 36, T35N, R12W.
  - TR-24; mid-term review that includes an incidental boundary revision of 87.3 acres, updates to ownership and control information, updates to water well information in the vicinity of the mine, and updates to various permit maps.
  - TR-25; King II surface hydrology (culverts and ditches) as-built upgrades located on state lands in Section 36, T35N, R12W.
  - TR- 26; five monitoring wells located on private lands outside of the current lease boundary in Section 3, T34N, R12W; Sections 34 and 36, T35N, R12W; and Sections 17 and 29, T35N, R11W.
- additional surface actions associated with exploration drilling operations at 13 sites in Sections 25 and 35 in T35N, R12W, and Section 19 in T35N, R11W (Figure 9-2);
- the proposed expansion and modification of the lease boundaries to include additional areas in Sections 19, 20 and 30, T35N, R11W and Sections 26 and 35, T35N, R12W (Figures 9-1 and 9-2);
- a Subsidence Control Plan;
- an updated Reclamation Performance Bond and Reclamation Plan for the exploration and monitoring wells;
- an updated Right of Entry for Ute Mountain Ute lands; and
- OSMRE public notice information related to this permit revision.

### **3. Title 30—Mineral Resources, Chapter VII—Office of Surface Mining Reclamation and Enforcement, Department of the Interior, Subchapter E – Indian Lands Program**

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#### **3.1 PART 750 — Requirements for Surface Coal Mining and Reclamation Operations on Indian Lands**

##### **3.1.1 750.12 — Permit Applications**

###### **3.1.1.1 750.12 (a-b) Fees and Copies**

- (a) In accordance with this application for a revision to their existing permit to conduct surface coal mining operations, GCC will submit all application fees in accordance with §750.25 of this Part.
- (b) Unless specified otherwise by OSMRE, GCC will file no less than seven copies of the complete permit application package with OSMRE. OSM will ensure that the affected tribes, the Bureau of Indian Affairs, and the Bureau of Land Management will receive copies of the application.

###### **3.1.1.2 750.12 (d)(1) Mining Plan**

An updated mining plan as required by 43 CFR 3480 (Resource Recovery and Protection Plans) is included in this PAP as Appendix 10.3 (Resource Recovery and Protection Plan). 25 CFR 216.7 Part 216.7 is not applicable to this area since this is not a surface coal mine.

###### **3.1.1.3 750.12 (d)(2)(i) Socioeconomics**

A description of the proposed coal mining and reclamation operation is provided in this section with respect to: (A) Increases in employment, population, and revenues to public and private entities; and (B) the ability of public and private entities to provide goods and services necessary to support surface coal mining and reclamation operations.

The King I Mine began operation in 1941 and achieved its average production level by 1988. The mine has been an integral part of the economy and society of La Plata and Montezuma counties, Colorado for more than 70 years. The King I Mine workings were depleted and the mine was closed in January of 2009, and the workforce was moved to the King II Mine with no changes in the levels of personnel, production, or economic and environmental impacts.

As of October 2016, GCC employed approximately 90 persons at the King II Mine. At this time, it is not possible to accurately estimate when fluctuations in the size of the workforce might occur.

The GCC King II Mine workforce is broken down into the following classes:

Administrative/Office	4
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Underground employees	70
Surface employees	16

Employees of GCC live primarily in La Plata, Montezuma, and San Juan Counties of Colorado and San Juan County of New Mexico. They commute to work in private cars or pickups or maintain a separate residence in the immediate area. Table 1 shows where GCC employees resided in 2016.

**Table 3-1. 750.12 (d)(2)(i) GCC Employee Residency Locations in 2016**

Location	Percent	Location	Percent
Bayfield, CO Area	7.78	Farmington, NM Area	16.67
Cortez, CO Area	36.67	Kayenta, AZ Area	2.22
Delta, CO Area	13.33	Utah Area	2.22
Durango, CO	21.11		

Since the work force has decreased in the last 5 years, it is expected that existing public and private entities will continue to be able to provide goods and services to support the workforce and mining operations.

**3.1.1.4 750.12 (d)(2)(ii) Scenic and Aesthetic Resources**

Evaluation of impacts to scenic and aesthetic resources, including noise, from mining and reclamation actions is summarized below. Copies of the complete noise and vibration studies are provided in Appendix 10.4 (Noise and Vibration Studies).

**Scenic Resources**

The visual resource management prescription applicable to the private/tribal surface ownership in the lease areas is related to La Plata County’s Land Use code and view compatibility standards (La Plata County Code of Ordinances Sections 70-42 (Preservation of visual resources) and 82-193(c) (2)(c)) (LPC 2017). These standards require that the King II Mine facility will not create adverse or unsightly views for neighbors or the travelling public. To meet these standards and mitigate potential visual resource impacts from the mine’s surface facilities and operations, GCC has implemented visual mitigation measures. The King II surface facility is located approximately 1,000 feet up a side-drainage above CR 120 and the facilities are barely visible from CR 120 and not visible from adjacent properties. During site development, efforts were made to preserve existing landscape and tree cover, and minimize footprint and surface disturbance. As part of the Class II Land Use application review, La Plata County requires that the King II Mine surface facility meets the La Plata County’s view compatibility standard and minimizes impacts to visual resources.

BLM lands adjacent to UMU lands in this area are classified as Visual Resource Management Class IV (BLM 2013). Under this management class the level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance and repeating the basic landscape elements (BLM 2017).

Current conditions within the permit boundary are generally natural and undisturbed. Current surface disturbances associated with King II mining includes the mine entrance and associated buildings (on state lands) and exploration drill sites (that have been reclaimed on UMU lands). No changes to the current natural conditions present on UMU lands within the permit boundary are expected as a result of this permit revision.

### **Noise and Vibration**

Since La Plata County does not have an applicable noise standard for coal mine facilities, State of Colorado Revised Statutes (CRS) Title 25. Health § 25-12-103 (maximum permissible noise levels) are used to establish maximum permissible noise levels in residential, commercial, and industrial locations. These standards, known as the Colorado Noise Law, set limits for residential properties of 55 A-weighted decibel (dBA) daytime (7 AM to 7PM) and 50 dBA nighttime at 25 feet from the property line. The standards include further limitations for periodic, impulsive, or shrill noise such as back-up alarms and warning devices (State of Colorado 2017).

Contractors hired by GCC conducted a noise study in 2013 to measure facility noise in the area around the mine to determine if these standards were being met. When corrected for wind or background noise, neighboring residences were found to have noise levels of 35 dBA to 37 dBA. A single point at the driveway entrance to mine property intermittently tested above 55 dBA when a truck entered or exited (EDI 2013). All the measured noise levels at the sites were well within compliance levels with the State of Colorado Noise Law or that of COGCC.

Another study completed in the project area also tested for the presence of vibration and sound emanating from mine 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 feet of the mine fan and conveyor. The study also indicated that this low-level ground vibration would not transmit beyond the immediate vicinity. 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 (CDS 2013).

A supplemental vibration study was performed in December 2014 to address adjacent landowner concerns that measurements in the 2013 noise and vibration study were made too far from

production activity and covered too short 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. 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 ¼ of the perception limit (CDS 2014).

The short duration of the exploration drilling and other actions identified under this permit revision are not expected to modify noise above current levels.

### **3.1.1.5 750.12(d)(2)(iii and iv) National Register of Historic Places**

To identify potential cultural or historical sites listed on the National Register of Historic Places (NRHP) within the permit area and areas adjacent to the proposed surface coal mining and reclamation operation, several Class III, or pedestrian, cultural resource surveys have been conducted within the current King II Mine COC-62920 lease and mine permit boundaries; at exploration drill sites on state lands associated with Colorado Department of Reclamation, Mining, and Safety (CDRMS) Technical Revision (TR)-22, for as-built irrigation and drainage upgrades on state land completed as part of TR-25, and at the monitoring well sites associated with TR-26 on private and state lands. The classes of properties of potential significance within the mine area, and a plan for the identification and treatment, in accordance with 36 CFR part 800, of properties significant and listed, or eligible for listing, on the NRHP within the permit area of the proposed surface coal mining and reclamation operation is summarized below.

Cultural resource survey areas are identified on Figure 9-3. Copies of the relevant surveys, as available and as noted below, are provided in Appendix 10.5.

In 2005, Complete Archaeological Service Associates (CASA) of Cortez, Colorado conducted a cultural and historic resources survey for the mine entrance surface disturbance areas located on state of Colorado lands in Section 36, T35N, R12W south of the CO 62920 lease boundary (CASA 2005) (see CASA 2005 on Figure 9-3). This survey covered ditch and irrigation upgrade work conducted under TR-25. No significant cultural or historic resources eligible for listing on the National Register of Historic Places (NRHP) or other significant archeological sites that may be affected by surface disturbance (including subsidence) were identified in this survey (CASA 2005). The State Historic Preservation Officer (SHPO) concurred with the findings of this survey (Contiguglia 2005).

In 2010, SWCA Environmental Consultants (SWCA) completed a Class III inventory for the appended 160-acre lease area in Section 26, T35N, R12W (Eisenhauer and Wilcox 2010) (see SWCA 2010 on Figure 9-3). Two previously unrecorded sites and four isolates were identified during this inventory. Only one of the sites was recommended as eligible for listing on the NRHP: Site 5LP9601, a homestead dating to the late nineteenth to early twentieth century. Isolates are not eligible for

listing on the NRHP. No other significant archeological sites that may be affected by surface disturbance were identified in the survey (Eisenhauer and Wilcox 2010). OSMRE determined that the potentially eligible site would be avoided by planned mining actions and requested concurrence from the SHPO on August 11, 2010 (Kirby 2010a) and from the Ute Mountain Ute Tribal Historic Preservation Officer (THPO) on August 19, 2010 (Kirby 2010b). No SHPO document concurrence with these requests has been identified to date by Ecosphere and it is assumed that the lack of response indicates acceptance by the SHPO and THPO of the initial determinations.

In 2011, PaleoWest Archaeology (PaleoWest) completed a Class III inventory of five proposed exploration drill hole locations in Section 25, T35N, R12W (Gilpin 2011) (PaleoWest 2011a, Figure 9-3). This survey, which covered drill sites associated with TR 22, identified two isolated finds that are not eligible for listing on the NRHP. THPO concurrence was received for the site eligibility recommendations from this survey (Knight 2012). OSMRE indicated in a letter to Tom Bird, GCC Energy, LLC, that no comments on the planned exploration drilling had been received from the Bureau of Land Management (BLM), Bureau of Indian Affairs, or Ute Mountain Ute Tribe (Postle 2012).

PaleoWest also completed a second pedestrian inventory of approximately 580 acres distributed among 4 parcels (A, B, C, and D) within the proposed lease expansion area. The cultural resource inventory was a mixture of reconnaissance and intensive level surveys (which loosely corresponds to Class II and Class III surveys, respectively). The survey was completed in 2012. Permission to survey Parcel E in the proposed lease modification area was not obtained from the private property owner and this parcel was not surveyed (Bourcy 2017) (PaleoWest 2011b on Figure 9-3). The 20 acres comprising the southwest corner of Parcel A was also not surveyed. These 20 acres were added after PaleoWest's 2012 survey was completed, as substitute acreage for Parcel C. The results of PaleoWest's 2012 survey indicated a low site density in the area. As the BLM's undertaking is a lease modification for an underground coal mine with little potential surface disturbance, it was determined that a survey of the 20 acres in the southwest corner of Parcel A was not necessary. No cultural resources recorded during the survey were determined to be eligible for listing on the NRHP. The BLM submitted a letter to the SHPO in December 2014 for informational purposes only with the determination that the proposed lease expansion would not affect any historic properties. In accordance with the BLM state protocol agreement with the Colorado SHPO for NHPA compliance, the BLM did not request comment or concurrence from the SHPO due to a finding of no historic properties affected. A copy of the PaleoWest survey was not available to Ecosphere, but was provided to the OSMRE by the BLM in March 2016 (Bourcy 2016).

In 2013, PaleoWest conducted a Class III block inventory of Sections 24 and 25 (T35N, R12W) and Sections 19 and 30 (T35N, R11W), that included the locations of 11 proposed exploration drill sites (Throgmorton and Clark 2014) (PaleoWest 2014a on Figure 9-3). This inventory resulted in the discovery of seven historic archaeological sites and 50 isolated finds. The historic sites included

road segments, a collapsed historic shack, a historic camp, an intake segment, and two dam and reservoir sites with associated intakes. The isolated finds included a variety of historic and prehistoric resources. PaleoWest recommended all sites as either “Not Eligible to the National Register of Historic Places” or noncontributing segments of unevaluated resources. In a letter to the SHPO, OSMRE recommended that Sites 5LP.10276 and 5LP.10591, both road segments, need additional data recovery since they have not been completely evaluated (Iloff 2015). The SHPO recommended Site 5LP.10591.1 as a non-supporting segment of NRHP-eligible resource 5LP.10591, but determined that none of the other sites or isolated finds were eligible for listing on the NRHP (Turner 2015).

In April, June, and August 2014, PaleoWest conducted intensive Class III inventories of 24 originally proposed test drill hole locations (GCC-14-01 through GCC-14-24) plus four revised drill hole locations, and 10 overland access corridors (Clark and Schwendler 2014) (see PaleoWest 2014b on Figure 9-3). The proposed drill holes and access corridors are in T35N, R11W, Sections 17–20 and 30, and T35N, R12W, Sections 13, 14, 23, and 24 on the USGS 7.5’ Hesperus and Thompson Park quadrangles in UTM Zone 12 of the New Mexico Principal Meridian. The original survey was conducted between April 16 and 17, 2014. PaleoWest returned on June 9, 2014 to inventory new locations for two drill holes (GCC-14-04 and GCC-14-22) that were moved to avoid archaeological sites, visiting the locations with a representative of the UMU. PaleoWest returned on August 24, 2014 to inventory new locations for two other drill holes (GCC-14-08 and GCC-14-12) and one additional associated access corridor. During the first two mobilizations PaleoWest inventoried a 30-meter (m) radius around each drill hole and a 30-m wide corridor for each access corridor. During the inventories, PaleoWest recorded two new cultural sites and five isolated finds. One site is a prehistoric artifact scatter and the other appears to be a historic hunting shack. Four of the isolated finds are prehistoric and one is historic. All of sites and isolated finds were recommend as not eligible for the NRHP. Proposed drill locations and overland travel routes were selected and routed at least 30 m away to avoid these cultural resources. PaleoWest and BLM recommended that the proposed drilling would have no effect on historic properties and no further cultural resource work is needed for this project. At the time of preparation of this summary, these proposed exploration sites had not been drilled.

In 2014, SWCA performed a cultural resource survey of nine core drill sites addressed in TR 22 and located on state of Colorado lands in Section 36, T35N, R12W (Wesson and Mowrer 2014) (see SWCA 2014 on Figure 9-3). One isolated find that consisted of two fragments of aqua bottle glass were identified during the survey. No cultural or historic resources eligible for listing on the NRHP or significant archeological sites that may be affected by surface disturbance were identified.

In 2016, Stratified Environmental and Archaeological Services (SEAS) conducted a Class III cultural resource survey outside of the current lease permit boundary for four groundwater monitoring well drill sites associated with TR-26 (see SEAS 2016 on Figure 9-3). One newly recorded prehistoric

site (5LP.11050) was found during the intensive cultural resource inventory in the vicinity of one of the proposed monitoring well sites. Site 5LP.11050, a large Basketmaker III period encampment (ca. AD 600-750), is considered eligible for listing on the NRHP under Criterion D due to its significant data potential. The proposed monitoring well site was relocated more than 50 feet from the site boundary to avoid disturbing the cultural site. As Site 5LP.11050 has been avoided by more than 50 feet, no further cultural resource work was recommended. SEAS recommended that cultural resource clearance should be provided for the project as no significant or potentially significant cultural properties would be affected (Loebig 2016). Information on SHPO concurrence for this survey was not available since the survey was conducted on private lands.

Approval to complete cultural surveys in the following portions of T35N, R12W have not been approved by the Ute Mountain Ute Tribe to date:

- Southwest corner of Section 25
- Portions of the eastern quarter of Section 26
- Northwest quarter of Section 35

Based on the results of these studies within the lease and permit boundary, two sites have been identified to date as eligible for listing on the NRHP within the lease and permit boundary:

- Site 5LP9601, a historic homestead in Section 26, T35N, R12W, is potentially eligible for listing on the NRHP. The site has been avoided to date and no concurrence from the SHPO or THPO was identified for this site by Ecosphere.
- Site 5LP.10591.1, a historic road segment located in the survey area in Sections 24 and 25 (T35N, R12W) and Sections 19 and 30 (T35N, R11W), has been identified as a non-supporting segment of NRHP-eligible resource 5LP.1 0591. The SHPO has concurred with this recommendation.

One additional NRHP-eligible site was identified in the vicinity of a proposed monitoring well location outside of the lease and permit boundary (Loebig 2016); however, the planned well site was relocated to avoid the cultural site. With the avoidance of known sites and the minimal amount of surface disturbance associated with previous actions, no effects to NRHP-eligible sites has or is expected to occur. No Native American religious concerns or potential traditional cultural properties within the permit area have been identified by the Ute Mountain Ute Tribe, cultural studies in the area, or by the THPO.

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, and/or the SHPO, as appropriate, will be contacted for direction in protecting the resource.

### **3.1.1.6 750.12 (d)(2)(v) Cultural Resources on Tribal Lands**

As discussed previously, cultural surveys have been conducted on UMU tribal lands within the permit boundary to comply with Federal laws aimed at protecting cultural resources on Indian lands. On tribal lands, only one site, 5LP9601, has been identified that is potentially eligible to the NRHP; no other significant sites were identified by the other surveys on tribal lands. No traditional use areas have been identified to date within the permit area.

No effects to sites on tribal lands is expected from completion of exploration drilling or expansion of the lease boundary. Upgrading of culverts and ditches at the mine entrance (TR-25) and monitoring wells site development (TR-26) would occur on state and private lands, respectively.

### **3.1.1.7 750.12(d)(2)(vi) Probable Changes in Air Quality**

No changes in air quality are expected to result from the additional actions identified for this permit revision and from the continued mining of coal. Exploration drilling activities would be minimal and of short duration. Drilling operations use dust suppression controls as necessary. The air quality permit, Colorado Department of Public Health and Environment, Air Pollution Control Division permit #09LP0202F, for the mine area is on file with CDRMS and at the mine office and would not require modification (Appendix 10.2). No additional measures would be needed to comply with prevention of significant deterioration limitations or other Federal laws for air quality protection.

### **3.1.1.8 750.12(d)(2)(vii) Important Habitats of Selected Wildlife Indicator Species**

No effects are expected to occur to wildlife habitat within the permit boundary from implementation of exploration drilling or continued underground mining associated with the lease modification since the only surface disturbance associated with this permit revision would be from exploration drilling at select locations within the permit boundary (Figure 9-2). Exploration drilling operations would be of short duration and disturbance areas would be less than 0.25 acre per site. All sites would be reclaimed with appropriate vegetation following completion of drilling as specified in Section 7.1.2 (Part 815.15). GCC understands that nesting birds protected under the Migratory Bird Treaty Act could potentially be affected during drilling operations; to protect nesting birds, all drilling actions will either be completed outside of the nesting season or appropriate nest clearance surveys will be conducted by experienced biologists prior to any disturbance.

Biological surveys completed on exploration drill site locations within the permit boundary and proposed lease modification area have not identified any sensitive wildlife species or their habitat (Ecosphere 2016a,b;SWCA 2014; BLM 2015). Habitat for the federally listed Mexican spotted owl (*Strix occidentalis lucida*) was identified outside of but adjacent to the permit and lease boundaries during surveys conducted in 2014 and 2015 by Ecosphere Environmental Services (Ecosphere 2016a). Owl presence/absence studies were completed over a two-year period in 2015 and 2015 by Ecosphere with no spotted owls identified (Ecosphere 2016a).

Review of Colorado Natural Heritage Program (CNHP) databases for special status species in the permit area identified only previous records from 1992 and 1993 for Townsends big-eared bat (*Corynorhinus townsendii pallescens*) (a species of concern for the BLM and Forest Service) and from 1979 for wolverine (*Gulo gulo*) (assumed extirpated from Colorado since 1979) (Menefee 2015); however, habitat for these species were not identified at any of the exploration drill site locations within the permit/lease boundaries (SWCA 2014, Ecosphere 2016b).

The proposed project modifications should not have any impacts on species listed under the Endangered Species Act provided that all activity within ½ mile of potential Mexican spotted owl habitat takes place outside of the breeding season (March 15 through August 31). In addition, surveys completed in 2014 and 2015 following the outline in the Mexican Spotted Owl Recovery Plan did not identify spotted owls in the area and a 'no effect' on the species may be inferred for the following 5 years (through 2020) for any activity in MSO habitat (Ecosphere 2016a; BLM 2015).

Copies of relevant biological investigations mentioned in this section are provided in Appendix 10.6 (Wildlife Studies).

#### **3.1.1.9 750.12(d)(2)(viii) Bald and/or Golden Eagle Nests or Prey Areas**

No records of active or inactive bald or golden eagle nests or prey areas have been identified within or adjacent to the permit area. No known occurrences were identified during review of the CNHP database (Menefee 2015) and biological studies completed in the permit area (Ecosphere 2016a,b; SWCA 2014; BLM 2015) have also not identified any active nests in the area.

Copies of relevant biological investigations mentioned in this section are provided in Appendix 10.6 (Wildlife Studies).

#### **3.1.1.10 750.12(d)(2)(ix) Threatened and Endangered Wildlife Species**

No suitable or critical habitat for federal listed threatened and endangered species has been identified within the permit boundary from previous biological investigations completed in the area (Ecosphere 2016a,b; BLM 2015; SWCA 2014).

Review of the US Fish and Wildlife Service's (USFWS) Information for Planning and Conservation (IPaC) database (USFWS 2017) identified 5 federally listed species with the potential to occur in the permit area; Mexican spotted owl (*Strix occidentalis lucida*), southwestern willow flycatcher (*Empidonax traillii extimus*), Chapin Mesa milkvetch (*Astragalus schmolliae*), New Mexico meadow jumping mouse (*Zapus hudsonius luteus*), and the wolverine (*Gulo gulo luscus*).

Two fish species, Colorado pikeminnow (*Ptychocheilus lucius*) and razorback sucker (*Xyrauchen texanus*), were identified as potentially being affected by any water depletions that could occur in the area (USFWS 2017). An approximately 34 acre-feet per year depletion of water from a San Juan River sub-basin is anticipated for continued coal mining under the proposed lease boundary

modification. In 2015, the OSMRE initiated a formal Section 7 of the Endangered Species Act consultation request with the USFWS for actions associated with the proposed lease boundary modification (Caveny 2015); species included in this consultation included those currently identified on the IPaC list. The OSMRE determined that there would be “no effect” on the continued existence to any listed species, with the exception of the Colorado pikeminnow and the razorback sucker, who had a determination of “likely to adversely affect” the continued existence of those species (Caveny 2015). The USFWS provided a biological opinion that there would be no effects to endangered fish species from water depletions of less than 100 acre-feet (USFWS 2015).

Copies of relevant biological investigations mentioned in this section are provided in Appendix 10.6 (Wildlife Studies).

### **3.1.2 750.15 — Coal exploration**

GCC will conduct coal exploration operations on Indian lands in accordance with 25 CFR part 216 (Bureau of Indian Affairs – Surface Exploration, Mining, and Reclamation of Lands) and 43 CFR part 3480 (BLM – Coal Exploration and Mining Operations Rules), whichever is applicable.

### **3.1.3 750.16 — Performance Standards**

Once OSMRE issues their permit for this revision, GCC agrees to conduct any surface coal mining operations on Indian tribal lands in accordance with parts 816, 817, and 822 of 30 CFR, Chapter VII. Parts 819, 823, 824, 827, and 828 are not applicable.

Prior to that time, GCC will conduct coal mining and reclamation operations in a manner that would adhere to the performance standards of 30 CFR chapter VII, subchapter B.

### **3.1.4 750.17 — Bonding**

GCC will comply with bonding requirements identified under Title 30, Chapter VII, Subchapter J as applicable on Indian lands.

### **3.1.5 750.25 — Permit Fees**

GCC will submit all applicable fees in the form of a certified check, bank draft, or money order payable to Office of Surface Mining. Fees will be submitted by the stage of review upon request by OSMRE.

## **4. Title 30—Mineral Resources, Chapter VII—Office of Surface Mining Reclamation and Enforcement, Department of the Interior, Subchapter F—Areas Unsuitable for Mining**

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### **4.1 PART 761 — Areas Designated by Acts of Congress**

#### **4.1.1 761.11 — Areas Where Surface Coal Mining Operations Are Prohibited or Limited**

##### **4.1.1.1 761.11(a)(1-6)**

No surface or underground coal mining operations are proposed on any lands within the boundaries of:

- the National Park System, the National Wildlife Refuge System, the National System of Trails, the National Wilderness Preservation System
- the Wild and Scenic Rivers System, including study rivers designated under section 5(a) of the Wild and Scenic Rivers Act, 16 U.S.C. 1276(a), or study rivers or study river corridors established in any guidelines issued under that
- National Recreation Areas designated by Act of Congress

##### **4.1.1.2 761.11(b-g)**

No surface or underground coal mining activities are proposed:

- on any Federal lands within a National Forest
- on any lands where the operation would adversely affect any publicly owned park or any place in the National Register of Historic Places
- within 100 feet, measured horizontally, of the outside right-of-way line of any public road, except where the mine access road joins the public road
- within 300 feet, measured horizontally, of any occupied dwelling
- within 300 feet, measured horizontally, of any public building, school, church, community or institutional building, or public park
- within 100 feet, measured horizontally, of a cemetery

## **5. Title 30—Mineral Resources, Chapter VII—Office of Surface Mining Reclamation and Enforcement, Department of the Interior, Subchapter G –Surface Coal Mining and Reclamation Operations Permits and Coal Exploration Systems Under Regulatory Programs**

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### **5.1 PART 773 — Requirements for Permits and Permit Processing**

#### **5.1.1 773.6 — Public Participation in Permit Processing**

##### **5.1.1.1 773.6(a)(i-iv) Filing and Public Notice**

Upon notification from OSMRE that their application is administratively complete, GCC will place an advertisement in the Durango Herald newspaper for at least once a week for four consecutive weeks. Draft language of the advertisement as it will appear in the newspaper is provided below:

#### **PUBLIC NOTICE**

GCC Energy, LLC, owner and operator of the King II coal mine located at 6473 County Road 120, Hesperus, CO, 81326, (970) 385-4528, has submitted a permit renewal application to renew the existing Federal Mining and Reclamation Permit CO-0106A with the U.S. Department of the Interior’s Office of Surface Mining Reclamation and Enforcement (OSMRE). The permit renewal application is submitted to continue underground mining pursuant to the Code of Federal Regulations (CFR Title 30, Subchapter E, 750 and Subpart F, 773 and 774). Additionally, GCC Energy has submitted a permit revision application to update several sections of the existing permit to include the shadow area related to a proposed modification expanding the existing Federal Coal Lease COC62920.

The King II Mine is located in portions of Section 19; Township 35 North, Range 11 West, N.M.P.M., and portions of Sections 24, 25, 26, and 35; Township 35 North, Range 12 West, N.M.P.M., La Plata County, CO.

The overlying surface of the existing permit area, and of the proposed modification area to be included in this permit, is owned by the Ute Mountain Tribe. The coal to be mined in the existing permit area is owned by the U.S. Department of Interior, the Ute Mountain Ute Tribe, Nancy Joan Dunn, Karen Stephens and Gary Stephens. The coal to be mined in the proposed modification area is owned by the U.S. Department of the Interior. All current and proposed mining activities of the King II Mine lie to the north side of Hay Gulch, approximately 6.5 miles southwest of Hesperus, as identified on U.S.G.S. 7.5 Minute Quadrangles of Hesperus, Kline, Mormon Reservoir, and Thompson Park. Federal coal has been extracted from the King II mine since 2007. Underground mining methods are the only methods in use at the mine.

The proposed land use at the completion of mining is rangeland.

A copy of the approved permit application package, permit renewal application, and permit revision application are available for public inspection at:

The La Plata County Clerk and Recorder, 98 Everett St., Suite C, Durango, Colorado

The Office of Surface Mining Reclamation & Enforcement – Western Region, 1999 Broadway, Suite 3320, Denver, Colorado, 80202, and on the OSMRE Western Region’s website at: <https://www.wrcc.osmre.gov/initiatives.shtm>

Written comments, objections or requests for informal conferences on the renewal or revision applications may be submitted within 30 days of the fourth and last publication of this notice, by any person with an interest that is or may be adversely affected. The name and address of the OSMRE representative where written comments, objections, or request for informal conferences may be submitted is:

Mr. Paul Clark  
Office of Surface Mining Reclamation and Enforcement  
Western Region Office  
1999 Broadway, Suite 3320  
Denver, CO, 80202-3050.  
1-866-847-7362 (press #6 for King II)  
[pclark@osmre.gov](mailto:pclark@osmre.gov)

### **5.1.2 773.16 — Performance Bond Submittal**

GCC has previously filed performance bond amounts for proposed actions within the permit boundary, in accordance with the provisions of Title 30, Chapter VII, Subchapter J. GCC will modify these bond amounts, if necessary, to reflect any additional bonding requirements that maybe identified by OSMRE.

## **5.2 PART 777 — General Content Requirements for Permit Applications**

### **5.2.1 777.11 — Format and Contents**

#### **5.2.1.1 777.11(c) Permit Application Package Verification**

A signed and notarized copy of the following statement is provided in Appendix 10.16:

I, Gina Lotito-Nance, Vice President of GCC Energy, LLC, being a responsible official of GCC Energy, LLC, do hereby verify, under oath, that the information contained in this permit revision application for the King II Mine (Federal Permit CO-0106A) is true and correct to the best of my information and belief.

\_\_\_\_\_

Date \_\_\_\_\_

Gina Lotito-Nance  
Vice President / Environmental and Energy Affairs  
GCC Energy, LLC

### **5.3 PART 778 — Permit Applications: Legal, Financial, Compliance, and Related Information**

#### **5.3.1 778.9(c) Certifying and updating existing permit application information**

A signed and notarized copy of the following statement is provided in Appendix 10.16:

I, Gina Lotito-Nance, Vice President of GCC Energy, LLC, being a responsible official of GCC Energy, LLC, do hereby verify under oath that the information provided in this permit revision application for the King II Mine (Federal Permit CO-0106A) is accurate and complete to the best of my information and belief.

\_\_\_\_\_ Date \_\_\_\_\_

\_\_\_\_\_ Gina Lotito-Nance  
Vice President / Environmental and Energy Affairs  
GCC Energy, LLC

#### **5.3.2 778.11(a-e) Providing Applicant and Operator Information**

**(a)(1)** GCC (applicant) is a limited liability company, formed under the laws of the State of Colorado. GCC is the operator and permittee of the King I Mine (Inactive) and the King II Mine (MSHA Identification Number 05-04864), located in La Plata County, Colorado.

**(a)(2) Employer Identification Number 20-2812006**

#### **(b)(1) Applicant and Operator Information**

GCC Energy, LLC  
AVS Entity Number: 247004  
Post Office Box 100  
11783 Highway 337  
Tijeras, New Mexico 87059  
Phone: (505) 281-3311  
Formed: October 22, 2007 (Colorado)

**(b)(2) Resident Agent in Colorado Information**

Chris Dorenkamp  
6473 County Road 120  
Hesperus, Colorado 81326  
Phone: (970) 385-4528  
Fax: (970) 385-4638

**(b)(3)** There is no operator different from the applicant.

**(b)(4)** See Section 778.11 (c and d) below for each business entity in GCC’s organizational structure, up to and including the ultimate parent entity of GCC.

**(c and d) Information for Officers and Directors**

GCC Energy, LLC is a corporation, incorporated under the laws of the State of Colorado. GCC Energy, LLC is the operator and permittee of the King I Mine (Formerly MSHA ID# 05-00266) and the King II Mine (MSHA ID# 05-04864), located in La Plata County, Colorado. The King I Mine ceased production and its portals were permanently sealed in January 2009. GCC Energy, LLC is the entity responsible for payment of abandoned mine land reclamation fees. GCC Energy, LLC is a wholly owned subsidiary of GCC of America, Inc., Post Office Box 636, Wilmington, Delaware 19899.

GCC of America, Inc. was incorporated in the state of Delaware on June 16, 1994 and is qualified to do business in Delaware and New Mexico. GCC of America, Inc. (AVS #: 157897) is the sole shareholder and 100 percent owner of GCC Energy, LLC. GCC of America, Inc. does not own or control any other surface coal mining operations in the United States. GCC of America, Inc. has not previously owned or controlled any other surface coal mining operations in the United States within the past five years.

GCC of America, Inc. is a wholly owned subsidiary of Grupo Cementos de Chihuahua, S.A. de C.V. Grupo Cementos de Chihuahua, S.A. de C.V. is the sole shareholder and 100 percent owner of GCC of America, Incorporated.

The following tables list all officers of each company. All officers can be contacted at the address and phone number listed after each applicable table.

**Table 5-1. 778.11(c) Officers of GCC Energy, LLC**

Name	Title	Effective Date	AVS Number
Ron Henley	President	March 1, 2016	255179
Gina Lotito-Nance	Vice President, Environmental and Energy Affairs	March 1, 2016	259480
Cesar Conde	Secretary	March 1, 2016	252622
Luis Carlos Chavez	Assistant Secretary	March 1, 2016	259481
Jeff Benson	Assistant Secretary	July 25, 2011	252623
Martha Rodriguez	Treasurer	March 30, 2005	157895
Luis Carlos Arias	Assistant Treasurer	March 30, 2005	157896

GCC Energy, LLC

11783 Highway 337

Tijeras, New Mexico 87059

AVS Entity #247004

Phone: (970) 385-4528 Fax: (970) 385-4638

Employer ID #20-2812006 Formed: Colorado October 22, 2007

**Table 5-2. 778.11(c) Officers of GCC of America, Incorporated**

Name	Title	Effective Date	AVS Number
Ron Henley	President	March 1, 2016	255179
Steve Ambrose	Vice President, Sales and Logistics	March 20, 2014	255176
Verne Stuessy	Vice President, Operations	March 1, 2016	250273
Andres Osuna	Vice President, Planning & Administration	March 20, 2014	157894
Gina Lotito-Nance	Vice President, Environmental and Energy Affairs	March 1, 2016	259480
Doug Roark	Vice President, Ready Mix and Aggregates	March 20, 2014	255177

Edward Hernandez	Vice President, Human Resources	March 20, 2014	255178
Sergio Saenz	Vice President, Legal Affairs	March 1, 2016	157893
Cesar Conde	Secretary	March 1, 2016	252622
Luis Carlos Chavez	Assistant Secretary	March 1, 2016	259481
Carlos Lopez	Controller	March 1, 2016	255180
Martha Rodriguez	Treasurer	March 30, 2005	157895
Luis Carlos Arias	Assistant Treasurer	March 30, 2005	157896

GCC of America, Incorporated  
Post Office Box 100  
11783 Highway 337  
Tijeras, New Mexico 87059  
Phone: (505) 281-3311  
AVS #: 157897

**Table 5-3. 778.11(c) Officers of Cementos de Chihuahua, S.A. de C.V.**

Name	Title	Effective Date	AVS Number
Enrique Escalante	Chief Executive Officer	March 1, 2016	157891
Martha Rodriguez	Chief Financial Officer	January 3, 2008	157895
Sergio Saenz	General Counsel	April 3, 2012	157893

Grupo Cementos de Chihuahua, S.A. de C.V.  
Post Office Box 100  
11783 Highway 337  
Tijeras, New Mexico 87059  
Phone: (505) 281-3311  
AVS #: 157898

### **5.3.3 778.12(a-c) Providing Permit History Information**

**(a)** Within the five-year period preceding the date of submission of this application, GCC has only operated the King I and II Mines in the United States under GCC Energy, LLC. GCC Energy, LLC holds State of Colorado Division of Reclamation, Mining and Safety Permit C-1981-035 for the King I and King II underground coal mines (adjacent to the requested Federal permit CO-0106) in the United States.

Prior to 2008, the King I and King II mines were owned and operated by National King Coal, LLC, the previous permittee and operator of the King I and King II mines. Since 2008, both business entities have been 100 percent owned by GCC of America, Inc.

**(b)** GCC Energy, LLC does not have any pending permit applications for surface coal mining operations filed in the United States.

#### **(c)(1) Former Permittee and Operator Name and Address**

National King Coal, LLC  
11783 Highway 337  
Tijeras, New Mexico 87059  
AVS Entity #:157890  
Phone: (970) 385-4528 Fax: (970) 385-4638

**(c)(2) Employer Taxpayer Identification Number: 20-2812006**

**(c)(3) Federal Permit Number: CO-0106A**

**State of Colorado Permit Number: C-1981-035**

**MSHA Mine ID (King I): 05-00266 (withdrawn)**

**MSHA Mine ID (King II): 05-04864**

#### **(c)(4) Regulatory Authority with Jurisdiction**

Federal Permit CO-0106A  
U.S. Department of the Interior  
Office of Surface Mining, Reclamation and Enforcement (OSMRE)  
1999 Broadway, Suite 3320  
Denver, Colorado 80202  
  
State Permit C-1981-035

Colorado Division of Reclamation, Mining & Safety  
1313 Sherman Street, Room 215  
Denver, Colorado 80203

**(c)(5)** GCC of America, Inc. is the parent corporation of GCC Energy, LLC, sole shareholder and 100 percent owner.

### **5.3.4 778.13 Providing Property Interest Information**

**(a)(1)** Legal or equitable owners of record of the surface and mineral within the permit area include:

**Surface ownership:**

Ute Mountain Ute Tribe  
Post Office Box 128  
Towaoc, Colorado 81334

**Mineral ownership:**

U.S. Department of Interior, Bureau of Land Management  
Colorado State Office  
2850 Youngfield Street  
Lakewood, Colorado 80215  
303.259.3600

**Mineral ownership (160 acre lease addition completed in 02/2010):**

Nancy Joan Dunn (25 percent ownership)  
c/o Bill Scott Dunn  
3207 N. El Dorado  
Chandler, AZ 85224

Gary L. Stephens (12.5 percent ownership)  
3660 N. Lakeshore Drive #3705  
Chicago, IL 60613-5300

Karen Stephens (12.5 percent ownership)  
27037 Oakmont Drive  
Valley Center, CA 92082

Ute Mountain Ute Tribe (50 percent ownership)

P.O. Box 128  
Towaoc, CO 81334

**(a)(2)** There are no current surface leaseholds on the property to be mined. GCC Energy, LLC is the sole mineral leaseholder.

**(a)(3)** There are no purchaser(s) of record under a real estate contract.

**(b)** The names and address of each owner of record of all property (surface and subsurface) contiguous to any part of the proposed permit area is provided in the following list.

- Compton, Patricia Ann Rev. Trust, 1129 C.R. 123, Hesperus, CO 81326 (Surface)
- Compton, Thomas Lee Rev. Trust, 1129 C.R. 123, Hesperus, CO 81326 (Surface)
- Crawford, Norris H & Ronald H, 2161 C.R. 121, Hesperus, CO 81326 (Surface)
- Crawford, Mike, 2161 C.R. 121, Hesperus, CO 81326 (Surface)
- Crescent Cross, Ltd. LLLP, 11951 C.R. 120, Hesperus, CO 81326 (Surface)
- Wiedemann, Theodore J. & Nancy M., 5960 East Territory Ave., Tucson, AZ 85750 (Surface)
- Ute Mountain Tribe, P.O. Box 248, Towaoc, CO 81334 (Surface)
- Wiltse, Jack B., 2416 East 20th, Apt. J5, Farmington, NM 87401 (Surface)
- Elaine J. Frazier, 2637 Dallas St. NE, Apt. #2, Albuquerque, NM 87110 (Surface)
- GCC Energy, LLC, 6473 C.R. 120, Hesperus, CO, 81326 (Surface)
- Colorado State Board of Land Commissioners, 1313 Sherman St., Room 620, Denver, CO 80203 (Surface & Coal)
- Blast & Cast, Inc.: P.O. Box 543, Silverton, CO 81433 (Surface)
- Patterson, Bonnie Eileen, 2161 C.R. 121, Hesperus, CO 81326 (Surface)
- Craig, Farmer, Compton Coal Lease:
  - Tom Compton - 1129 C.R. 123, Hesperus, CO 81326
  - Mary Ann Craig – P.O. Box 1047, Durango, CO 81302
  - Farmer Oil & Gas - 17235 N. 75th Ave., Suite C160, Glendale, AZ 85308
  - Kambe Coal Lease: Tom Kambe, Jr. - 899 Marina Dr., Napa, CA 94559

**(c)** GCC does not hold or have any interests, options, or pending bids under a real estate contract for the property to be mined or properties contiguous to the permit area.

**(d)** The King I Mine is inactive and sealed; its MSHA identification number has been withdrawn. Its prior MSHA identification number was 05-00266. The MSHA Number for the King II Mine is MSHA ID# 05-04864.

### **5.3.5 778.14 Providing Violation Information**

**(a)(1)** Neither GCC, its operator, any subsidiary, affiliate, or entity that is owned or controlled by GCC Energy, LLC, has ever had a Federal or State mining permit for surface or underground mining operations suspended or revoked during the five-year period preceding the date of submission of the application.

**(a)(2)** Neither GCC, its operator, any subsidiary, affiliate, or entity that is owned or controlled by GCC Energy, LLC, has forfeited a performance bond or similar security deposited in lieu of bond during the five-year period preceding the date of submission of the application.

**(b)** GCC has not had a suspension, revocation, or forfeiture as identified under paragraph (a).

**(c)(1-5)** GCC received one violation notice during the three-year period preceding the date of submission of this application. CV-2015-001 was issued for Federal Permit Number: CO-0106A and King II Mine’s MSHA number 05-04864 by the Colorado Division Mining, Reclamation and Safety, on April 21, 2015. The Notice of Violation was served to Trent Peterson at GCC Energy, LLC, MSHA ID # 05-04864. It states that, “The northern margin of the Coal Storage Pile #2, processed coal stockpiled at Stack Tube #2 was found to have overrun both the designated pad area and the surrounding collection ditch. And to have encroached upon undisturbed ground from which topsoil had not been previously salvaged.”

The condition was immediately corrected and CV-2015-001 was terminated on May 18, 2015.

**(c)(6-7)** No administrative or judicial proceedings concerning the violation notice have been implemented. The abatement period for the violation issued has ended and violation notification CV-2015-001 was terminated on May 18, 2015.

### **5.3.6 778.15 Right of Entry Information**

**(a-c)** The King II Mine is located within Sections 35 and 36, Township 35 North, Range 12 West, NMPM, in La Plata County, Colorado. The surface and minerals of the area to be mined are owned by the State of Colorado and the BLM. GCC has lease agreements and right of entry agreements that establish GCC’s legal right to enter and to mine coal under the lands described in this permit application. These include lease agreements with the BLM, the Tribe, the Stephens family, and the Dunn family, and a right of entry agreement with the Tribe. None of these agreements are the subject of pending litigation. Included in Appendix 10.1 are copies in full of the executed leases and right of entry agreements that establish right of entry to mine coal under the lands described in this permit application.

### **5.3.7 778.16 Status of Unsuitability Claims**

(a) The proposed permit area is not known to be located within any area designated as unsuitable for surface coal mining operations or within any area under study for such a designation.

### **5.3.8 778.17 Permit Term**

(a) Mining within the permit area commenced immediately upon issuance of this permit in 2007. With the expansion of the lease boundary, it is anticipated that mining of the permit area will be completed in approximately 10 years. A permit renewal term of 5 years was previously requested in the permit renewal application provided to OSMRE on December 2, 2016. The permit renewal is temporarily on administrative hold until completion of NEPA analysis.

### **5.3.9 778.18 Insurance**

(a) A certificate certifying that GCC Energy, LLC has a public liability insurance policy in force that meets the minimum requirements as specified in 800.60 is included in Appendix 10.15. Renewals of this policy would be forwarded to the following address:

United States Department of the Interior  
Office of Surface Mining Reclamation and Enforcement  
1999 Broadway, Suite 3320  
Denver, Co. 80202-3050

The policy would be maintained in full force during the life of the permit and any renewal thereof, including completion of all reclamation operations.

### **5.3.10 778.21 Proof of Publication**

Upon notification from OSMRE that their application is administratively complete, GCC will place an advertisement in the Durango Herald newspaper for at least once a week for four consecutive weeks. A copy of the newspaper advertisement announcing the application for revision of the permit and renewal of the permit application will be filed with the OSMRE and will be made a part of the application no later than 4 weeks after the last date of publication, as required by §773.6(a)(1) of Title 30, Subchapter G.

A draft copy of the advertisement as it will appear in the newspaper is provided below:

GCC Energy, LLC, owner and operator of the King II coal mine located at 6473 County Road 120, Hesperus, CO, 81326, (970) 385-4528, has submitted a permit renewal application to renew the existing Federal Mining and Reclamation Permit CO-0106A with the U.S. Department of the Interior's Office of Surface Mining

Reclamation and Enforcement (OSMRE). The permit renewal application is submitted to continue underground mining pursuant to the Code of Federal Regulations (CFR Title 30, Subchapter E, 750 and Subpart F, 773 and 774). Additionally, GCC Energy has submitted a permit revision application to update several sections of the existing permit to include the shadow area related to a proposed modification expanding the existing Federal Coal Lease COC62920.

The King II Mine is located in portions of Section 19; Township 35 North, Range 11 West, N.M.P.M., and portions of Sections 24, 25, 26, and 35; Township 35 North, Range 12 West, N.M.P.M., La Plata County, CO.

The overlying surface of the existing permit area, and of the proposed modification area to be included in this permit, is owned by the Ute Mountain Tribe. The coal to be mined in the existing permit area is owned by the U.S. Department of Interior, the Ute Mountain Ute Tribe, Nancy Joan Dunn, Karen Stephens and Gary Stephens. The coal to be mined in the proposed modification area is owned by the U.S. Department of the Interior. All current and proposed mining activities of the King II Mine lie to the north side of Hay Gulch, approximately 6.5 miles southwest of Hesperus, as identified on U.S.G.S. 7.5 Minute Quadrangles of Hesperus, Kline, Mormon Reservoir, and Thompson Park. Federal coal has been extracted from the King II mine since 2007. Underground mining methods are the only methods in use at the mine.

The proposed land use at the completion of mining is rangeland.

A copy of the approved permit application package, permit renewal application, and permit revision application are available for public inspection at:

The La Plata County Clerk and Recorder, 98 Everett St., Suite C, Durango, Colorado

The Office of Surface Mining Reclamation & Enforcement – Western Region, 1999 Broadway, Suite 3320, Denver, Colorado, 80202, and on the OSMRE Western Region’s website at: <https://www.wrcc.osmre.gov/initiatives.shtm>

Written comments, objections or requests for informal conferences on the renewal or revision applications may be submitted within 30 days of the fourth and last publication of this notice, by any person with an interest that is or may be adversely affected. The name and address of the OSMRE representative where written comments, objections, or request for informal conferences may be submitted is:

Mr. Paul Clark  
Office of Surface Mining Reclamation and Enforcement  
Western Region Office  
1999 Broadway, Suite 3320  
Denver, CO, 80202-3050.  
1-866-847-7362 (press #6 for King II)  
pclark@osmre.gov

### 5.3.11 778.22 Facilities or Structures Used in Common

All structures associated with the King II Mine will be shared by the OSMRE Permit (CO-0106A) and the contiguous Colorado State Permit for the King II Mine (C-81-035). All surface structures are located on State of Colorado Coal Mining Lease CO-3388, Section 36, T35N, R12W, NMPM. The surface facilities and structures at the King II Mine are depicted on Figure 9-4.

The following list identifies the structures permitted under the OSMRE permit and the state permit. In general, the mine facilities include the mine bench and portals, offices, maintenance, and shop facilities, infrastructure for supplying power and ventilation to the mine (substation, fuel tanks, water and septic systems), haul and access roads, sediment control systems, stockpiles for topsoil and coal products, and coal sorting and load-out structures. A reclamation bond is in place for the eventual reclamation of the area.

**A) 100,000 Gallon Water Storage Tank:** This steel tank will be removed from the site during reclamation. Concrete bases will be broken and buried in place or used for portal backfill.

**B) 37,000 Gallon Water Storage Tank:** This steel tank will be removed from the site during reclamation. Concrete bases will be broken and buried in place or used for portal backfill.

**C) Pump House:** Portable steel building used to house the various pumps and plumbing. This building as well as piping will be removed and sold as scrap.

**D) Shop Equipment Wash Pad:** This concrete pad is used in conjunction with an oil skimmer and storage tank to store equipment wash water. It is pumped by a third-party vendor.

**E) Shop Building:** 50'W x 60'L x 16'H steel building used for repair of various mine machinery and fabrication.

**F, I) Mine Ventilation Fan:** The main mine fan will be a 7-foot diameter fan that is part of a steel structure consisting of air doors for escape purposes, explosion doors that protect the fan in the event of a mine explosion, and a culvert system that connects the fan to the underground workings.

**G) Retaining Wall Adjacent to Main Fan:** This wall is poured reinforced concrete and is used to protect workers and equipment from material that may fall from the high-wall cut above the fan portal.

**H) Total Portal Reclaim Volume:** Map King II-010D shows a volumetric calculation of fill quantities required to backfill all portals and the access road to the belt/return portal area.

**J) Travelway Portal Structure:** This concrete and steel structure will be broken and used for portal backfill.

**K, VV) Motor Control Centers #1 & #2:** These are portable steel buildings that will be removed from the site.

**L) Rock Dust Storage Silo:** 11' diameter x 40' tall steel silo for up to 150 tons of rock dust storage that will be removed from the site or cut up and sold as scrap.

**M1, M2) Concrete Block Retaining Walls #1 & #2:** These are pre-cast concrete block retaining walls used to adjust grade near the office and shop area. They will be broken and buried in place or used for portal backfill.

**N) Executive Offices/ Parts Warehouse/ Bath House Building:** 60'W x 150'L x 34'H steel building to contain all administrative offices, miner's changing and shower facilities, and a spare parts/supplies warehouse.

**O) Covered Storage:** This 20W' x 80L' x19'H open steel building will be of pole barn style construction, with steel post uprights and stringers, covered on the roof and three sides by corrugated steel.

**P) Main Septic System Tank:** This structure is a concrete tank that will be broken up and left in place during reclamation. All pipes to the tank will be removed and disposed of during reclamation.

**Q) Parking Area:** A 120'x175' graveled area adjacent to the Office Building. The gravel will be excavated and used for backfill at the portal area.

**R) Fuel Storage Area:** This 25W' x 45L' x20'H steel 3 sided structure will house one 2000 gallon diesel fuel tank with containments for fueling and an contained area for storage of lubricants for underground and surface diesel powered machines.

**S) Main Septic System Drain Field:** This structure is comprised of an underground gravel field that will be left in place during reclamation. All pipes to the drain field will be removed and disposed of during reclamation.

**T) Belt Portal Structure:** This concrete and steel structure will be broken and used for portal backfill.

**U) Return Portal Structure:** This concrete and steel structure will be broken and used for portal backfill.

**V) Belt Portal Pump House:** Concrete building used to house various pumps and plumbing. This building as well as piping will be broken and used for portal backfill.

**W) Temporary Waste Rock Storage Area:** This area is to be used for temporary storage of underground mine waste rock waiting to be transported to the refuse pile at the King I mine.

**X) Bermed Topsoil Storage #2:** Stored topsoil from this open pile will be re-spread on the disturbed areas after backfilling and grading. The bulk of salvage soil material from the site is very similar in composition and will be used for backfilling and topsoil as needed. The footprint of the topsoil storage area will be reseeded during re-vegetation.

**Y, Y1) Electrical Substation:** Electrical transformers and infrastructure, including transmission lines, poles, switchgear, concrete slabs and control room) will be removed. The gravel base for the 60 x 80 foot substation area will be excavated and used for backfill at the portal area.

**Z) Substation Ground Field:** This area is laced with large, bare copper wire for grounding the main electrical substation. This wire will be pulled from the ground and sold as scrap.

**AA) Main Dumpster Pad:** The roll-away dumpster sits on this pad. The dumpster is provided by a local waste disposal service.

**BB0 thru BB6) Slope Conveyor:** This 42" conveyor delivers coal from inside the mine to the Coal Stack Tube #1 & Head House, 20,000 Ton Coal Storage Pile #1. Part of this conveyor utilizes a covered "box truss" design.

**CC) Magnet Dumpster Pad #1:** A small dumpster sits on this pad to receive the material which is picked up by the belt magnet. The dumpster is provided by a local waste disposal service.

**DD, DD1) Coal Stack Tube #1 & Head House, 20,000 Ton Coal Storage Pile #1:** Coal will be removed from the site prior to reclamation. Any remaining coal or coal fines will be excavated and buried under four (4) or more feet of non-toxic non-combustible backfill (including topsoil).

**EE) Magnet Dumpster Pad #2:** A small dumpster sits on this pad to receive the material which is picked up by the belt magnet. The dumpster is provided by a local waste disposal service.

**FF thru FF4) Raw Coal Conveyor:** 36" conveyor which draws coal from the bottom of the raw coal storage stockpile and delivers it to a coal crusher.

**GG) Crushing/Screening Structure:** This steel structure processes raw coal. Coal is crushed to a 2" x 0" product for sale to commercial customers and sorted to additional sizes for domestic customers.

**HH, JJ) Lump & Stoker Conveyors #1 & #2:** These 24” radial stacker conveyors are used to stockpile the domestic coal products once they have been screened. These are portable conveyors that will be removed from the site.

**II, KK) Domestic Coal Piles #1 & #2:** Raw coal from underground will be delivered to the Coal Crusher/Screening structure. Larger pieces of coal for domestic use will be separated and stored here using Stacker Conveyors #1 & #2. This coal will be delivered by truck to an off-site domestic coal sales yard. Provisions will also be made at this area to divert waste rock and lower quality coal for shipment to a refuse pile or for re-blending into the commercial coal product.

**LL) Crushed Coal Storage Conveyor:** Crushed coal is moved from the Coal Crusher/Screening Structure to the Coal Stack Tube & Head House, 20,000 Ton Coal Storage Pile #2 via a 36” conveyor.

**MM, MM1) Coal Stack Tube #2 & Head House, 20,000 Ton Coal Storage Pile #2:** Coal will be removed from the site prior to reclamation. Any remaining coal or coal fines will be excavated and buried under four (4) or more feet of non-toxic non-combustible backfill (including topsoil).

**NN) Cross-belt Coal Sampler:** This small steel structure sits on a concrete pad. A motorized arm collects coal samples from the conveyor belt and deposits them in buckets for analysis.

**OO thru OO5) Truck Loadout Conveyor:** 36” conveyor which draws coal from the bottom of the crushed coal storage stockpile and delivers it to the Truck Loadout bins.

**PP) Truck Loadout Structure & Bins:** The truck loadout facility will be an automated batch-weigh structure. Coal trucks will arrive under a chute at the bottom of the loadout and a pre-measured amount of coal will be deposited in the trailer.

**QQ) Truck Scales:** These are portable scales that will be removed from the site during reclamation.

**RR) Coal Sales Building:** This 17W’ x 21L’ x10’H structure is a conventional stick-built building.

**SS, TT) Coal Sales Building Septic Tank and Drain Field:** The drain field is comprised of an underground gravel field that will be left in place during reclamation. All pipes to the drain field will be removed and disposed of during reclamation. The tank is a concrete tank that will be broken up and left in place during reclamation. All pipes to the tank will be removed and disposed of during reclamation.

**UU) Coal Sales Building Parking Area:** This level area used for temporary storage. Gravel from this area will be buried in place and re-topsoiled or excavated and used for portal backfill.

**WW) Bermed Topsoil Storage #1:** Stored topsoil from this open pile will be re-spread on the disturbed areas after backfilling and grading. The footprint of the topsoil storage area will be reseeded during re-vegetation.

**XX) Concrete Truck Wash-Out:** This small bermed area is used to collect material that is washed from the trucks that deliver concrete to the site.

**XX) Concrete Truck Wash-Out:** This small bermed area is to collect material that is washed from trucks which deliver concrete to the site.

**YY) Sediment Pond and Diversion Ditches:** The sediment pond is not intended as permanent feature of the mine site, but will remain intact until the site has been successfully reclaimed.

**ZZ) Cattle Guard:** The cattle guard will either be removed or cut up for scrap or offered to the surface grazing lease holder of the area.

**AAA) Portable Offices and Storage Containers:** Until the Executive Offices/Parts Warehouse/Bath House Building is completed, several portable offices and storage containers will be utilized. These units are leased from a 3<sup>rd</sup> party supplier.

**BBB) Waterline to Connect to Huntington Ranch Waterline:** The waterline will be buried a minimum of 4 feet deep to avoid freezing. The waterline will be left in place during the reclamation phases to supply water to the site for plant germination and dust control. Upon final reclamation, the valve feeding the pipe will be closed. There are no plans to remove the buried portions of the pipe for reclamation purposes. The surface of the field, once the original trench has been back-filled, will be re-seeded using the approved seed mix.

**CCC) Equipment Storage Area:** A small area just north of the shop used to store machinery or supplies.

## **5.4 PART 783 - Underground Mining Permit Applications - Minimum Requirements for Information on Environmental Resources**

### **5.4.1 783.11 General Requirements**

A description of the existing environmental resources within the proposed permit area and adjacent areas that may be affected or impacted by the proposed underground mining activities is provided below. The information addressing the environmental conditions of the permit and adjacent areas and the description of the mining and reclamation plan are largely

drawn from information submitted to and approved by the Colorado Division of Reclamation, Mining and Safety (CDRMS) under CDRMS permit # C-81-035 and TR 22, 24, 25, and 26 for the King II Mine. Exploration drilling that may occur in the proposed lease modification areas in Sections 19 and 30, T35N, R11W, have been previously approved in BLM coal exploration license COC76563 (Appendix 10.2) and analyzed under BLM Environmental Assessment DOI-BLM-CO-S010-2014-0025 (BLM 2015) and natural resource surveys at coal exploration drill sites completed by Ecosphere (2016). Relevant information is included as needed from those documents. Surface disturbance is limited to the existing portal, offices, and coal transportation facilities located on State lands in Section 36, T35N, R12W, and to exploration drilling in Sections 25 and 35, T35N, R12W, and Sections 19 and 30, T35N, R11W (Figure 9-1).

The areas of the King II Mine where surface disturbance can and could occur is depicted on Figure 9-4. This includes the office, portal, and coal transportation facilities, which are located at the bottom at the confluence of two dry drainage basins, and exploration drill sites. The drainage basin valley bottom opens into Hay Gulch approximately 0.5 miles from the location of surface facilities and underground mine portals. The exploration drill site locations are typically located on ridgelines and mesa tops to the north of the office and portal area.

The area has been historically used by European settlers for ranching and by Native Americans prior to that for hunting and gathering. Exploration drilling sites are almost entirely located within an area managed by the UMU 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. During project proponent meetings with the UMU Tribe, it was confirmed by the Tribe that grazing in the areas is limited to mainly horses. The Ute Mountain Ute property is also used by the Tribe for hunting deer, elk, bear, turkey, and occasionally mountain lion.

Current land uses of the proposed permit area include rangeland, wildlife habitat, and undeveloped land. These will be the land uses to which the property is returned after completion of coal mining and reclamation. There has been no change of land use during the last five years.

Two dominant vegetation communities are found within the permit/lease boundaries; Rocky Mountain Gambel oak-mixed montane shrublands and Colorado Plateau piñon-juniper woodland community. These vegetation communities are described in further detail under Section 783.19.

## **5.4.2 783.12 General Environmental Resources Information**

### **5.4.2.1 783.12(a) Lands Subject to Coal Mining**

The King II Mine proposes to continue mining, by only underground mining methods, a coal lease belonging in whole, to the United States of America, administered by the U.S. Department of Interior, Bureau of Land Management (BLM). Except for the north half of the southeast quarter of Section 35, Township (T) 35 North (N), Range (R) 12 West (W), the Ute Mountain Ute Tribe owns 100 percent of the surface rights to the current lease property, which overlies the BLM coal lease (COC-62920) assigned to GCC, described as follows:

T 35 N, R 11 W, New Mexico Prime Meridian (NMPM) North of Ute Line, Section 19, lots 3 to 5 inclusive, east half of the southwest quarter and southeast quarter.

T35N, R 12 W, NMPM, North of Ute Line, Section 24, lots 1 to 3 inclusive, and southwest quarter of the southeast quarter. Section 25, lots 1, 2, W2 northeast quarter and west half. Section 26, southeast quarter of the northeast quarter, east half of the southeast quarter, southwest quarter of the southeast quarter. Section 35, northeast quarter, and north half of the southeast quarter.

Containing approximately 1,311.69 acres.

In a 2010 permit revision, an additional coal lease area owned in part by the Tribe (50 percent), Stephens (25 percent), and Dunn (25 percent), was appended to OSMRE Permit CO-0106A (Appendix 10.1). The Tribe owns 100 percent of the surface rights to this property, which overlies the coal lease assigned to GCC and is described as follows:

T 35 N, R 12 W, NMPM North of Ute Line, Section 26, east half of the southwest quarter and northwest quarter of the southeast quarter, southwest quarter of the northeast quarter.

Containing approximately 160 acres.

The surface property above these 160 acres of leased lands is not located on "Indian Trust" or "Reservation" lands, but was purchased by the Tribe from the Dunn family.

Map "King II-OSMRE-005 Mine Plan" is included in the permit application package to illustrate general size, sequence, and timing of the mining of sub-areas of the King II mine (Figure 9-5). The map is divided into areas that would normally be mined as a logical group. These groups are labeled by year or years such as "Year 1", "Year 2-4", etc. This timing map has been

developed to anticipate, as closely as possible, the approximate time-frame that the groups shown represent. Geologic conditions, economic market conditions, etc. often affect actual mine development that can alter expected timing.

#### **5.4.2.2 783.12(b) Cultural, Historic, and Archaeological Resources**

Cultural historic and archeological resources listed or eligible for listing on the National Register of Historic Places and known archeological sites within the proposed permit and adjacent areas are described in detail in Section 750.12(d)(2)(iii and iv) and summarized here. To comply with Federal laws aimed at protecting cultural resources multiple cultural surveys have been conducted to date on lands located within the permit boundary and proposed lease modification area that could potentially be affected by surface and underground actions. Two sites have been identified to date within the permit area and proposed lease modification area as eligible for listing on the NRHP:

- Site 5LP9601, a historic homestead in Section 26, T35N, R12W, is potentially eligible for listing on the NRHP. The site has been avoided to date.
- Site 5LP.10591.1, a historic road segment located in the survey area in Sections 24 and 25 (T35N, R12W) and Sections 19 and 30 (T35N, R11W), has been identified as a non-supporting segment of NRHP-eligible resource 5LP.1 0591. The SHPO has concurred with this recommendation.

No other significant cultural sites have been identified to date within the lease modification area and permit boundary. One additional NRHP-eligible site was identified in the vicinity of a proposed monitoring well location outside of the lease and permit boundary (Loebig 2016); however, the planned well site was relocated to avoid the cultural site. With the avoidance of known sites and the minimal amount of surface disturbance associated with previous actions, no effects to NRHP-eligible sites has or is expected to occur. No Native American religious concerns or potential traditional cultural properties within the permit area have been identified by the Ute Mountain Ute Tribe, cultural studies in the area, or by the THPO.

#### **5.4.3 783.18 (a)(1- 3) Climatological Information**

The climatological factors that are representative of the permit area and proposed lease modification area are not site-specific. However, average temperature and precipitation data has been recorded for the Fort Lewis Station, located approximately 5 miles southeast of the King II Mine, and that station is used to provide data for this section.

Prevailing wind data is not recorded at the King II Mine or Fort Lewis Station, but is available from the La Plata County (Durango) Regional Airport. All data in this section is from the summaries available at <http://www.wrcc.dri.edu/cgi-bin>.

**Table 5-4. 783.18(a)(1). Fort Lewis Station Mean Monthly Precipitation (inches)**

	Jan	Feb	Mar	Apr	May	Jun
<b>Mean</b>	<b>1.67</b>	<b>1.39</b>	<b>1.50</b>	<b>1.15</b>	<b>1.03</b>	<b>0.69</b>

	Jul	Aug	Sep	Oct	Nov	Dec	Annual
<b>Mean</b>	<b>2.06</b>	<b>2.27</b>	<b>1.72</b>	<b>1.90</b>	<b>1.44</b>	<b>1.37</b>	<b>18.19</b>

**Table 5-5. 783.18(a)(3). Fort Lewis Station Mean Monthly Temperature (°F)**

	Jan	Feb	Mar	Apr	May	Jun
<b>Max.</b>	<b>36.8</b>	<b>40.5</b>	<b>46.5</b>	<b>56.1</b>	<b>65.9</b>	<b>76.6</b>
<b>Min.</b>	<b>9.4</b>	<b>12.7</b>	<b>19.3</b>	<b>25.9</b>	<b>32.9</b>	<b>40.4</b>
<b>Mean</b>	<b>23.0</b>	<b>26.6</b>	<b>32.9</b>	<b>40.9</b>	<b>49.2</b>	<b>58.4</b>

	Jul	Aug	Sep	Oct	Nov	Dec	Annual
<b>Max.</b>	<b>81.2</b>	<b>78.2</b>	<b>71.9</b>	<b>61.2</b>	<b>46.8</b>	<b>38.4</b>	<b>58.3</b>
<b>Min.</b>	<b>48.4</b>	<b>47.1</b>	<b>39.7</b>	<b>30.3</b>	<b>19.5</b>	<b>11.4</b>	<b>28.1</b>
<b>Mean</b>	<b>64.7</b>	<b>62.7</b>	<b>55.9</b>	<b>45.8</b>	<b>33.2</b>	<b>24.9</b>	<b>43.2</b>

**Table 5-6. 783.14(a)(2).Durango Airport Prevailing Wind Direction**

	Jan	Feb	Mar	Apr	May	Jun
<b>Direction</b>	<b>N</b>	<b>N</b>	<b>N</b>	<b>WSW</b>	<b>W</b>	<b>N</b>

	Jul	Aug	Sep	Oct	Nov	Dec	Annual
<b>Direction</b>	<b>N</b>						

#### 5.4.4 783.19 Vegetation Information

Descriptions of dominant vegetative communities occurring within the permit area and proposed lease modification area have been previously documented in BLM 2015 and Ecosphere 2016 and are paraphrased in this section. Surface disturbance within vegetation

communities is expected to occur only in association with exploration drilling actions and in scattered areas with less than 0.5 acre of disturbance at each drill site.

#### **5.4.4.1 783.19(a) Vegetation Community Description**

Within the permit boundary and proposed lease expansion area, existing plant communities have been classified as:

Rocky Mountain Gambel oak-mixed montane shrublands, Rocky Mountain ponderosa pine woodland, Rocky Mountain montane mesic mixed conifer forest and woodland, and Colorado Plateau piñon-juniper woodland, Rocky Mountain Aspen Forest and Woodland, (BLM 2015).

The Rocky Mountain Gambel oak-mixed montane shrublands series is the most abundant vegetative community occurring in the lease expansion area and vicinity. This series occurs mostly on rolling hills and above drainages in the project area and vicinity. Dominant vegetation occurring within this series includes Gambel oak (*Quercus gambelii*), blue grama (*Bouteloua gracilis*), and snowberry (*Gaultheria sp.*) (BLM 2015).

Rocky Mountain montane dry-mesic and mesic mixed conifer forest and woodland communities occur throughout the lease modification area. This series occurs mostly in drainages and drainage bottoms. Species associated with the vegetative community includes Douglas fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*) with understory species such as squirreltail (*Elymus elymoides*), slender wheatgrass (*Elymus trachycaulus*), Oregon grape (*Mahonia repens*), and buckwheat species (*Eriogonum sp.*).

The Colorado Plateau piñon-juniper woodland community includes piñon pine (*Pinus edulis*) and Rocky Mountain juniper (*Juniperus scopulorum*) with understory species such as gamble oak, Indian ricegrass (*Achnatherum hymenoides*), lupine (*Lupinus sp.*), brome (*Bromus sp.*), sweetclover (*Melilotus officinalis*), black sagebrush (*Artemisia nova*), rabbitbrush (*Ericameria nauseosa*), and Utah serviceberry (*Amelanchier utahensis*). These areas also contained a minor component of alderleaf mountain mahogany (*Cercocarpus montanus*), beardtongue (*Penstemon sp.*), Bigelow sage (*Artemisia bigelovii*), cheatgrass (*Bromus tectorum*), mullein (*Verbascum sp.*), and wild crab apple (*Peraphyllum ramosissimum*) (BLM 2015, Ecosphere 2016b).

Other vegetation communities occurring in small patches in the lease modification area include the Rocky Mountain Aspen Forest and Woodland and the Rocky Mountain Ponderosa Pine Woodland.

## 5.4.5 783.21 Soil Resources Information

### 5.4.5.1 783.21(a)(1-4) Soil Survey Information

Soil survey information on those portions of the permit area to be affected by surface exploration drilling operations or facilities was obtained from the NRCS soils survey website and is summarized below. The NRCS report is provided in Appendix 10.9; a map with the approximate boundaries of the soils types found within the current and proposed lease boundary is provided in Section 9 (Figure 9-6).

Approximately 10 different soils types could occur within the existing and proposed lease boundary. These soils are summarized in Table 783.21(a) and described in more detail in the NRCS report provided in Appendix 10.7.

**Table 5-7. 783.21(a)(1-4). Soil types found in the lease area**

Map Unit Symbol	Map Unit Name	Description	Limitations and Productivity
3	Weminuche like loam, 12 to 45 percent slopes	Colluvium derived from sandstone and shale. Usually found on mountain slopes.	Deep soil. Not prime farmland or hydric.
7	Archuleta-Sanchez, stony, complex, 12 to 65 percent slopes	Colluvium over residuum weathered from sandstone and shale. The complex is comprised of 45 percent Archuleta loam and 30 percent Sanchez very stony sandy clay loam. Remaining constituents are clays, loams, and rock. Usually found on dip slopes.	Deep soil. Not prime farmland or hydric.
30	Fortwingate-Rock outcrop complex, 6 to 25 percent slopes	Slope alluvium derived from sandstone and/or loess; slope alluvium derived from sandstone and/or loess. Typically found on mountain slopes.	Not prime farmland or hydric. Very low available water storage in profile.
39	Hesperus loam, 3 to 12 percent slopes	Medium-textured alluvium derived from mixed sources. Found in alluvial fans and valleys.	Deep soil. Not prime farmland or hydric. Very high available

Map Unit Symbol	Map Unit Name	Description	Limitations and Productivity
			water storage in profile.
42	Lazear-Rock outcrop complex, 12 to 65 percent slopes	Northeast, south, and southwest facing drainage sideslopes within the project area. This map unit comprises the Lazear series and exposed rock outcrops (in this area, sandstone and shales). The Lazear series is described as a loamy, mixed (calcareous), mesic Lithic Ustic Torriorthent. This series is wouldow and well-drained, formed in residuum and alluvium derived from sandstone.	Not prime farmland or hydric. Very high runoff class. Low available water in profile.
47	Nutrioso loam	Medium-textured alluvium derived from mixed sources. Found on alluvial fans, valleys.	Deep soil. Not prime farmland or hydric. High available water storage in profile.
56	Pulpit loam, 3 to 12 percent slopes	Eolian deposits over residuum weathered from sandstone. Well-drained sandy to clay or silty clay loam derived from loess. Typical profile of loam to clay loam and silty clay loam to fine sandy loam, 0 to 88.9 cm (0–35 inches).	Not prime farmland or hydric.
69	Umbarg loam	Moderately fine-textured alluvium. Found within the level colluvial deposits between the bordering side slopes of the drainage basins. Fine-loamy, mixed mesic Cumulic Haplustolls. Typically forms in alluvium on fans and upland valley bottoms. Deep and moderately well drained.	Prime farmland if irrigated. Not hydric

Map Unit Symbol	Map Unit Name	Description	Limitations and Productivity
71	Valto-Rock outcrop complex, 12 to 65 percent slopes	Slope alluvium and/or residuum weathered from sandstone. Found on breaks, ridges, mountain slopes.	Not prime farmland or hydric. Very high runoff class.
79	Zau stony loam, 3 to 9 percent slopes	Residuum weathered from sandstone and shale. Found on mesas, mountain slopes.	Not prime farmland or hydric. High runoff class.
80	Zau stony loam, 9 to 25 percent slopes	Residuum weathered from sandstone and shale. Found on mesas, mountain slopes.	Not prime farmland or hydric. High runoff class.

Source: NRCS 2017

#### 5.4.5.2 783.21(b) Overburden Materials

GCC does not propose to use selected overburden materials as a supplement or substitute for topsoil.

#### 5.4.6 783.24 Maps

##### 5.4.6.1 783.24(a-c) Boundaries

(a) Figures 9-1 and 9-7 identify all boundaries of lands and names of present owners of record of those lands, both surface and sub-surface, included in or coterminous with the permit area.

(b) Figures 9-1 and 9-7 identify the boundaries of land within the permit area upon which the applicant has the legal right to enter and begin underground mining activities.

(c) Figure 9-5 depicts the boundaries of all areas proposed to be affected over the estimated total life of the underground mining activities, with a description of size, sequence, and timing of the mining of sub-areas.

##### 5.4.6.2 783.24(d) Buildings

The only structures located within 1,000 of the permit area include existing mine facilities. These include the mine bench and portals, offices, maintenance, and shop facilities, infrastructure for supplying power and ventilation to the mine (substation, fuel tanks, water and septic systems), haul and access roads, sediment control systems, stockpiles for topsoil and coal products, and coal sorting and load-out structures. These structures are discussed in more detail in Part 778.22 and are illustrated in Figure 9-4.

#### **5.4.6.3 783.24(e)**

The location of surface and sub-surface man-made features within, passing through, or passing over the permit area, including, but not limited to, major electric transmission lines, pipelines, and agricultural drainage tile fields are illustrated on Figure 9-8.

#### **5.4.6.4 783.24(f)**

The location and boundaries of proposed reference areas for determining the success of revegetation are illustrated in Figure 9-8.

#### **5.4.6.5 783.24(g) Water Supply Intakes**

There are no locations of water supply intakes for current users of surface waters flowing into, out of, or within the lease area. Ephemeral drainages that receive surface water discharges from areas within the lease area are depicted on Figure 9-9.

#### **5.4.6.6 783.24(h) Public Roads**

There are no public roads located within or within 100 feet of the permit area.

#### **5.4.6.7 783.24(i) Public Parks and Cultural and Historic Resources**

There are no public parks or known cultural or historic resources identified to date listed or eligible for listing in the National Register of Historic Places within the permit area. Maps identifying archeological site locations have been previously provided to the OSMRE archeologist separately due to the confidential nature of the resource. Figure 9-3 depicts the areas where cultural surveys have been completed in the lease area and a summary of cultural sites identified in the lease area is provided in Section 750.12(d)(2)(iii and iv) of this permit revision application.

#### **5.4.6.8 783.24(j) Cemetery**

There are no cemeteries located within 100 feet of the proposed permit area.

#### **5.4.6.9 783.24(k) National System of Trails and Wild and Scenic Rivers**

There are no lands within the proposed permit area that are located within the boundaries of any units of the National System of Trails or the Wild and Scenic Rivers System, including any study rivers designated under Section 5(a) of the Wild and Scenic Rivers Act.

#### **5.4.7 783.25(a-b) Cross Sections, Maps, and Plans**

Cross sections, maps, and plans showing the information required by this section are in Section 9 – Figures.

**783.5(a)(1-10)** The following figures include cross sections and plans showing proposed mine actions:

- (1)** Figure 9-5b depicts the elevations and locations of test borings and core samplings;
- (2)** The elevations and locations of monitoring stations being developed to gather data on water quality and quantity is provided in Figure 9-11. There are no monitoring stations to collect data on fish and wildlife or air quality. Air quality emission limits are based on the production/processing rates of the facility (Appendix 10.2).
- (3)** Nature, depth, and thickness of the coal seams to be mined, any coal or rider seams above the seam to be mined, each stratum of the overburden, and the stratum immediately below the lowest coal seam to be mined are depicted in Figure 9-5b;
- (4)** All coal crop lines and the strike and dip of the coal to be mined within the proposed permit area;
- (5)** Location and extent of known workings of active, including mine openings to the surface within the proposed permit and adjacent areas; Known underground workings within the permit area are depicted on Figure 9-5a. No inactive, or abandoned underground mines have been identified within the permit area.
- (6)** Location and extent of sub-surface water, if encountered, within the proposed permit or adjacent areas, including, but not limited to areal and vertical distribution of aquifers, and portrayal of seasonal differences of head in different aquifers on cross-sections and contour maps are depicted on Figure 9-11;
- (7)** Location of surface water bodies such as streams, lakes, ponds, springs, constructed or natural drains, and irrigation ditches within the proposed permit and adjacent areas is included on Figure 9-11 and 9-12;
- (8)** There are no known previously surface-mined areas within the permit area.
- (9)** Location and dimensions of existing areas of spoil, waste, coal development waste, and non-coal waste disposal, dams, embankments, other impoundments, and water treatment and air pollution control facilities within the proposed permit area; There are no known areas of spoil, waste, coal development waste, non-coal waste, dams, embankments, water treatment, or air pollution control facilities within the permit area. No stock pond impoundments are located on UMU lands.

**(10)** Location, and depth if available, of gas and oil wells within the proposed permit area and water wells in the permit area and adjacent areas; There are no known oil or gas wells within the permit area. Known water wells are identified in the hydrology section of this PAP.

**783.25(b)** Cross-sections, maps and plans included in a permit application as required by this section were prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, a professional geologist, or in any State which authorizes land surveyors to prepare and certify such cross sections, maps and plans, a qualified, registered, professional, land surveyor, with assistance from experts in related fields such as landscape architecture, and would be updated as required by the regulatory authority.

## **5.5 PART 784 - Underground Mining Permit Applications- Minimum Requirements for Reclamation and Operation Plans**

### **5.5.1 784.11 Operation Plan: General Requirements**

#### **5.5.1.1 784.11 (a) Coal Mining Methods**

This section includes a narrative description of the type and method of coal mining procedures and proposed engineering techniques, anticipated annual and total production of coal by tonnage, and the major equipment to be used for all aspects of those operations.

The King II Mine is an underground coal mining operation employing room and pillar design and techniques for extraction of the coal resource from the upper Menefee seam. Under this method, a series of mine openings are developed from the surface to the coal resources of the mine property outside the boundary of this permit area. At the King II Mine, the upper Menefee coal seam outcrops along Cochran Canyon and East Alkali Gulch. The portals (mine openings) are constructed at the seam outcrop on State of Colorado property. The openings or entries are advanced in the coal following the seam. No shafts (vertical openings) or inclines through overburden material are necessary.

The engineering and design of the mine require that coal reserves be divided into sections or panels convenient for extraction and in alignment with the mains to facilitate access and extraction. Rooms (larger open areas from which coal is extracted) are developed. Coal pillars are left at the periphery of the rooms to support the main roof. The size, location, and number of rooms and pillars are determined by the physical characteristics (thickness, load bearing capability, presence of non-coal inclusions) of the coal in each location of the mine. With the completion of a given panel or section (when all minable coal has been extracted), the remaining pillars are mined as the operation retreats from the panel. In this way, the recovery of the coal is maximized. Site work began at the King II Mine in April 2007. The first coal was extracted July 25, 2007. Proven coal reserves at present are approximately 8-9 million tons.

Current annual production is approximately 600,000 to 620,000 tons. The annual projected maximum production of coal is 1,300,000 tons. Total life of mine at maximum projected production is estimated to be 4 – 7 years (through April 2021 – April 2024). King I cumulative and King II cumulative total surface acreage approved for disturbance for 2016 was 48.59 acres. Disturbed areas include surface facilities for King I and II, three sediment ponds, roads, refuse pile (gob), and exploration drill pads.

The coal will be mined using one or two continuous mining units (sections). These sections consist of one or two continuous miners, 2 to 4 shuttle cars, one or two dual boom roof drills (bolter machines), a feeder/breaker belt feeder, and an electrical power center. After coal is cut from the face by the continuous miner, it is loaded into the shuttle cars for transporting to the conveyor belt and removal from the mine.

All the previously identified equipment is electrical. Haulage vehicles for moving miners and supplies into the mine are diesel or battery powered. Electric power for the mine is supplied by a surface sub-station. Voltage entering the mine is 12,470 volts of alternating current (VAC), which is stepped down by the power center in the mine to 950/480 VAC for the electrical equipment. Water used for dust suppression and motor cooling in the mine is supplied via a 4- to 6-inch diameter pipe.

Figure 9-5 shows current and proposed mine workings within the Permit Area (and adjacent area) boundaries.

#### **5.5.1.2 784.11 (b)(1-6) Construction, Operation, Closure**

No dams, embankments, or other impoundments are expected to be developed as part of mine operations.

No overburden handling or storage areas or structures are present on the mine property and none are expected to be required. Approximately 20,500 cubic yards of material were removed from the portal area and used to construct the mine bench and base for all mine surface facilities. Topsoil storage piles are maintained for use during reclamation of the office and loadout areas. The reclamation plan calls for utilizing the soil stored in the bermed topsoil storage areas for re-vegetating the area upon abandonment of the mine. Topsoil is salvaged and stockpiled during the operation in piles constructed adjacent to the sediment pond and north of Coal Stack Tube #2. The topsoil pile is stabilized using the seed mix proposed for final reclamation. Additionally, a berm is constructed around the perimeter of the toe of the topsoil piles. The berms are of sufficient size (18" to 24" high, 4' to 6' wide) to prevent machinery from intruding on the topsoil stockpile. Stockpiled topsoil will be placed at all areas of new disturbance caused by exploration core drilling that may damage existing topsoil, such as

“cuttings pits”, used to collect drill cuttings. Existing topsoil will be removed from these areas and stockpiled in a nearby area where it can be accessed without causing damage to the stockpile location. The topsoil stockpile will be “bermed”, tarped, or otherwise protected to help prevent loss of topsoil due to rain and wind events. Once the cuttings pits have been re-filled with sub-soil material, the topsoil will be returned to its original location, spread evenly, and re-seeded. Topsoil for exploration core drilling and/or monitoring well drilling and reclamation will be salvaged from the following soil map units; Big Blue Clay Loam, Pulpit Loam, Umbarg Loam, and Witt Loam. Topsoil for mine reclamation will be salvaged from the Zau Stony Loam map unit where suitable material for reclamation (greater than 6 inches is recoverable through normal means) is present. Topsoil for reclamation will not be salvaged from the following soil map units; Archuleta-Sanchez Stony Complex, Lazear Stony Loam, and Lazear Rock Outcrop Complex due to limitations for use in reclamation an overall lack of suitable material.

Construction or operations changes related to coal removal, handling, storage, cleaning, and transportation areas and structures will occur generally within the operations area located on state land in Section 36, T35N, R12W. All surface facilities for the support and processing of coal are shown in Figures 9-4 and 9-5 and discussed further in Section 5.5.1.1. No surface mining operations exist on the project area; all coal extraction activities will be confined to the underground King II Mine. The mine facilities include the mine bench and portals, offices, maintenance, and shop facilities, infrastructure for supplying power and ventilation to the mine, substation, fuel tanks, water and septic systems, haul and access roads, sediment control systems, stockpiles for topsoil and coal products, and coal sorting and load-out structures.

Surface activities associated with spoil, coal processing waste, mine development waste, and non-coal waste removal, handling, storage, transportation, and disposal areas and structures would all occur within Section 36, T35N, R12W. Spoil material from the worked areas will remain in the general facilities area in the west drainage area for use as fill. Salvageable steel, concrete and other construction materials will be removed from the mine site to a salvage yard or regulated landfill, if not needed for portal backfill. Materials will be stored while awaiting removal as shown on Figure 9-4. All debris, acid-forming and toxic-forming materials constituting a fire hazard are disposed of by a local waste removal company such as Waste Management or Baker Sanitation. Grease, lubricants, paints, flammable liquids, etc. are stored in the Fuel Storage Building with proper containment and collected on a regular basis by a certified hazardous material collection company such as Safety Kleen. At no time is any non-coal mine waste deposited in a refuse pile or impounding structure, and no excavation for noncoal mine waste disposal is located within 8 feet of any coal outcrop or coal storage area. No coal mine waste will be returned to underground workings at the King II Mine.

Mine facilities are generally located within the operations area on state land in Section 36, T35N, R12W. All surface facilities for the support and processing of coal are shown on Figures 9-4 and 9-5 (Operations Plan and Surface Features Map) and discussed in Section 5.5.1.1. No surface mining operations exist on the project area; all coal extraction activities will be confined to the underground King II Mine. Mine facilities include the mine bench and portals, offices, maintenance, and shop facilities, infrastructure for supplying power and ventilation to the mine, substation, fuel tanks, water and septic systems, haul and access roads, sediment control systems, stockpiles for topsoil and coal products, conveyor system, and coal sorting and load-out structures.

Water pollution control facilities include diversion structures. Diversion culverts and channels divert up-slope runoff around disturbed areas (Figure 9-9).

## **5.5.2 784.12 Operation Plan: Existing Structures**

### **5.5.2.1 784.12(a)(1-4) Description**

Existing structures currently used to facilitate underground mining are located on state land in Section 36, T35N, R12W. The King II Mine is strictly an underground mine and no structures are proposed to be used in connection with or to facilitate surface coal mining and reclamation operations. A discussion of existing structures being used to support underground mining is provided in Section 5.3.11, Part 778.22.

### **5.5.2.2 784.12(b)(1-4) Compliance**

No existing structures are proposed to be modified or reconstructed for use in connection with or to facilitate coal mining and reclamation operations.

## **5.5.3 784.13 Reclamation Plan: General Requirements**

### **5.5.3.1 784.13(a-b)**

(a) Each application would contain a plan for the reclamation of the lands within the proposed permit area, showing how the applicant will comply with sections 515 and 516 of the Act, subchapter K of this chapter, and the environmental protection performance standards of the regulatory program. The plan would include, at a minimum, all information required under 30 CFR 784.13 through 784.26.

(b) Each plan would contain the following information for the proposed permit area;

(1) A detailed timetable for the completion of each major step in the reclamation plan;

After completion of mining the following sequence of reclamation events will occur. These actions are estimated to take the specified amount of time but GCC Energy, LLC does not

commit to any specified timeframe. Certain activities may be accelerated or delayed dependent on season and whether they can be carried on contemporaneously with other activities.

**Table 5-8. 784.13(b)(1). Reclamation timetable**

ACTIVITY	ESTIMATED TIMEFRAME
Mine Portal Sealing	One month
Demolition and Removal of Structures	Four months
Backfilling and Grading	Six months
Re-Establishment of Surface Drainages	Two months
Re-Topsoiling	Two months
Revegetation	One Month
Removal of Sediment Control Structures, Re-Topsoiling, and Revegetation	Two months (through two years later)
Revegetation Monitoring	Biennially

(2) A detailed estimate of the cost of the reclamation of the proposed operations required to be covered by a performance bond under subchapter J of this chapter, with supporting calculations for the estimates is contained in Appendix 10-2.

(3) A plan for backfilling, soil stabilization, compacting and grading, with contour maps or cross sections that show the anticipated final surface configuration of the proposed permit area, in accordance with 30 CFR 817.102 through 817.107;

Backfilling and grading will be undertaken to achieve the post-mining topographic configuration shown in Figure 9-10.

(4) This section details a plan for removal, storage, and redistribution of topsoil, subsoil, and other material to meet the requirements of §817.22 of this chapter and a demonstration of the suitability of topsoil substitutes or supplements under §817.22(b) of this chapter based upon analysis of the thickness of soil horizons, total depth, texture, percent coarse fragments, pH, and areal extent of the different kinds of soils. The regulatory authority may require other chemical and physical analyses, field-site trials, or greenhouse tests if determined to be necessary or desirable to demonstrate the suitability of the topsoil substitutes or supplements.

**Soil Removal, Storage, and Redistribution Plan** - Sufficient suitable topsoil resources exist in the Umbarg soil map unit to provide topsoil replacement depths of six inches. This replacement

depth will require stockpiling and ultimate replacement of 20,570 cubic yards of topsoil from the A and B horizons of the Umbarg series. Topsoil will be salvaged and stockpiled using truck/shovel or scraper methods. Topsoil will be salvaged and stockpiled during the operation in piles constructed adjacent to the sediment pond and north of Coal Stack Tube #2 (Figure 9-4). The topsoil pile will be stabilized using the seed mix proposed for final reclamation. A berm will be constructed around the perimeter of the toe of the topsoil piles. The berm will be of sufficient size to prevent machinery from intruding on the topsoil stockpile.

Topsoil will be salvaged and replaced at all areas of new disturbance caused by exploration core drilling that may damage existing topsoil, such as “cuttings pits”, used to collect drill cuttings. Existing topsoil will be removed from these areas and stockpiled in a nearby area where it can be accessed without causing damage to the stockpile location. The topsoil stockpile will be bermed, tarped, or otherwise protected to help prevent loss of topsoil due to rain and wind events. Once the cuttings pits have been re-filled with sub-soil material, the topsoil will be returned to its original location, spread evenly, and re-seeded.

Topsoil will be replaced to a finished depth of six inches over all disturbed areas to be reclaimed. Topsoil replacement operations will be completed after backfill and grading operations. To ensure good contact between replaced topsoil and re-graded material, the surface of re-graded areas will be left in a roughened condition. Topsoil will be replaced using methods to minimize compaction after placement. In areas where compaction occurs, ripping or tilling of the replaced topsoil will take place.

**Soil Suitability** - Umbarg soils are found within the level colluvial deposits between the bordering sideslopes of the drainage basins. These are fine-loamy, mixed mesic Cumulic Haplustolls. These soils typically form in alluvium on fans and upland valley bottoms. They are deep and moderately well drained. The presence of this soil series was confirmed by sampling at three locations within the area of disturbance (Table 5-1). Soil suitable for plant growth and revegetation was identified to an average depth of 25.3 inches.

**Table 5-9. 784.13(b)(4) Soil suitability data**

Soil/Parameter	pH	EC	SAR	Texture
<b>Umbarg (range)</b>	<b>6.94-7.72</b>	<b>0.3-0.7</b>	<b>0.5-0.6</b>	<b>Sandy loam- Loam</b>
<b>Umbarg (mean)</b>	<b>7.38</b>	<b>0.47</b>	<b>0.53</b>	
<b>Lazear (range)</b>	<b>7.1-7.62</b>	<b>0.3-0.5</b>	<b>0.6-1.2</b>	<b>Clay-Sandy clay loam</b>
<b>Lazear (mean)</b>	<b>7.44</b>	<b>0.4</b>	<b>0.93</b>	
<b>Sanchez</b>	<b>6.56</b>	<b>0.4</b>	<b>0.7</b>	<b>Sandy clay loam</b>

Soil/Parameter	pH	EC	SAR	Texture
<b>Suspect Levels</b>	<b>&lt;5.5 or &gt;8.8</b>	<b>&gt;8.0</b>	<b>&gt;16.0</b>	

Based on the results of soil sampling and field identification and mapping, the Umbarg soils appear suitable for use in reclamation. If disturbed, the Sanchez series soils can provide limited amounts of suitable soil for reclamation. Lazear series soils, given their concentration of clay and relative wouldow and stony nature are not particularly suited for reclamation. The depth and extent of the Umbarg soils within the area for surface disturbance, make salvage of these soils in sufficient amounts for reclamation preferable.

(5) This section details a plan for revegetation as required in 30 CFR 817.111 through 817.116, including, but not limited to, descriptions of the—

(i) Schedule of revegetation;

With the significance and dominance of cool season graminoid species in the rabbitbrush/big sage mixed shrub-land community, emphasis should be placed on ensuring germination and survival of these species in the re-vegetation seed mixes. Precipitation during the growing season (April-September) decreases from April through June, increases in July and August, and then decreases slowly through the end of the growing season. Given this precipitation distribution, two seeding windows are proposed. A spring seeding window would take advantage of increased mid-late summer precipitation, encouraging summer growth and allowing plants to add sufficient biomass prior to winter. A second autumn seeding window allows seeding into relatively moist ground, but prevents significant seedling growth prior to freezing, allowing seeds to remain dormant over the winter with adequate moisture for early germination in the spring.

Two optimal windows for re-vegetation seeding are proposed dependent on the observations described above; a spring window from March 15 to June 15 and a fall window from August 15 to November 15.

Vegetation seeding will occur during the first planting window after completion of work within the re-graded and topsoiled area.

(ii) Species and amounts per acre of seeds and seedlings to be used;

The seed mix for the re-vegetation of the King II Mine was developed based on the stated post-reclamation land uses of rangeland and fish and wildlife habitat, and the goal of reestablishing

vegetation communities’ characteristic of the pre-disturbance landscape and complementary to those vegetation communities currently existing outside the areas of disturbance.

A seed mix for the mine site requires species adapted to predominantly loamy soils. The plant species must be adapted to xeric and potentially droughty moisture conditions, given the predominantly south and southwest exposures of the area to be reclaimed. Most species selected were cool season, complementing the adjacent native vegetation. The species selected were robust, and either tall or bushy to provide wildlife cover and forage. A mix of warm and cool season species was developed to provide wildlife with cover and forage throughout the growing season. Graminoids, forbs, and shrubs to be seeded provide a mix of plant morphologies and structures.

**Table 784.13(b)(5)(ii) – 1. Revegetation Seed Mix: Rangeland Areas**

Common Name	Species Name	Variety	Seeds per pound	Seeds per square foot	Seeding rate – pounds of pure live seed per acre
Graminoids					
western wheatgrass	<i>Agropyron smithii</i>	Arriba	120,000	6	2.18
slender wheatgrass	<i>Agropyron trachycaulum</i>	San Luis	140,000	4	1.24
sideoats grama	<i>Bouteloua curtipendula</i>	Butte	175,000	4	1
blue grama	<i>Bouteloua gracilis</i>	Lovington	725,000	10	0.6
mountain brome	<i>Bromus marginatus</i>	Bromar	75,000	3	1.74
Indian ricegrass	<i>Oryzopsis hymenoides</i>	Paloma	150,000	5	1.45
Forbs					
copper globemallow	<i>Sphaeralcea coccinea</i>	ARS 2936	500,000	5	0.44
small burnet	<i>Sanguisorba minor</i>		45,000	3	2.9
<i>Totals</i>				40	11.56
note: rates proposed are for drill seeding, broadcast rate = 2 times the drill rate					

**Table 784.13(b)(5)(ii) – 2. Revegetation Seed Mix: Additional Species for Pinyon-Juniper Areas**

Common Name	Species Name	Variety	Seeds per pound	Seeds per square foot	Seeding rate – pounds of pure live seed per acre
Shrubs					

Winterfat	<i>Ceratoides lanata</i>	Hatch	112,000	5	1.94
Mountain Mahogany	<i>Cercocarpus montanus</i>	Montane	45,000	5	4.84
Bitterbrush	<i>Purshia tridnetata</i>	Maybell	15,000	3	8.71
Skunkbush Sumac	<i>Rhus trilobata</i>	Bighorn	20,000	2	4.36
<i>Totals</i>				15	19.85
note: rates proposed are for drill seeding, broadcast rate = 2 times the drill rate					

(iii) Methods to be used in planting and seeding;

Drill seeding will be employed in all areas where slopes are 3:1 or less and equipment access is not a problem. In the remaining cases, broadcast seeding will be employed.

The drill should be regulated to place seed between 0.25 and 0.5 inches in depth from the ground surface. The seeding rate identified in each seed mix table is the rate of application to be used when drill seeding. Drill rows should be positioned to be perpendicular to the predominant wind direction and along the contour. In areas where marginal seeding conditions exist (rocky, windswept, wouldow soil), two passes of the drill seeder are appropriate, the applications being perpendicular to each other and 45° offset from the predominant wind direction.

Broadcast seeding will be employed in areas where drill seeding cannot be employed due to limitations in area or slope. Where broadcast seeding is employed a centrifugal, fan, airblast, or hydroseeder should be used to distribute the seed. Whenever broadcast methods are employed it is critical to ensure that the seed is subsequently covered through

raking, harrowing, disking, cultipacking, or mulching. Seeding rates for broadcast seeding are twice those employed for drill seeding.

(iv) Mulching techniques;

Mulch will be employed to minimize loss of seed due to wind and water, and to provide additional moisture retention. Any of the following mulch methods may be employed depending on time of anticipated reseeding, mulch availability, and site specific factors such as slope and aspect.

**Hay/Straw Mulch** - Hay and/or straw mulch will 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 must be certified as native and weed and pest free in accordance with U.S. Department of Agriculture regulations. Hay or straw mulch will be applied at a rate of

two (2) tons per acre and crimped or disked into the surface of the soil. Application should be perpendicular to the predominant wind direction and/or the direction of surface water flow.

**Hydromulch and Tackifier** - Hydromulch and tackifier will be used to anchor seed and any amendments to the soil surface on revegetation areas where the slope is greater than 2.5:1 (horizontal: vertical). Hydromulches to be used would be inert wood and plant fiber products (cellulose), and acceptable tackifiers would be comprised of plant gums or organic co-polymers. Hydromulch and tackifiers should be applied with a hydromulcher at a manufacturer's recommended rate of 2,500 pounds of hydromulch and tackifier per acre. Hydromulch and tackifier should be applied after seeding, and any application of other soil amendments.

**Stubble Mulch** - As an alternative to hay or straw mulch in the same applications, stubble mulch (nurse or cover crop) may be employed. This mulch should only be employed in areas accessible to mowing, should that be necessary to control mulch growth or spread. Suitable mulches to be employed would include sterile crosses of agricultural wheat and native wheatgrasses (such as the product Regreen®), sorghum, barley, or other agricultural crop grass. The local Natural Resource Conservation Service office, Agricultural Extension office, or other crop management agency will be contacted to determine stubble mulch strip width, direction, and seeding rate for specific stubble mulch planting.

(v) Irrigation, if appropriate, and pest and disease control measures, if any;

Irrigation is not employed at the King II Mine.

As an integral part of the revegetation plan, noxious weeds and plant pests will be managed within the revegetated areas. Weed species to be controlled are identified as those plant species identified by current state statute or regulation as noxious. The species are not listed here as the list of noxious species changes regularly. Plant pests are defined as those biological species that significantly predate the desirable vegetation of the project site.

The presence of noxious weeds and plant pests will be monitored annually during the summer. Management measures will be undertaken where a single or combination of noxious weed species or plant pests comprises or shows 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 feet or such area shows depredation or plant impacts of the same magnitude, such area will be identified as a patch, and subject to management measures, irrespective of the percentage of overall noxious weed cover in the mitigation area.

Noxious weeds or plant pests may be controlled by any combination of cultural, mechanical, biological or chemical measures. Weed control measures will 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 will occur during the first normal planting or seeding season after weed control measures have been implemented.

(vi) Measures proposed to be used to determine the success of revegetation as required in 30 CFR 817.116;

The success of planted and seeded vegetation will be monitored biennially after initial planting and seeding. Monitoring will consist of qualitative and quantitative vegetation sampling techniques that measure the vegetation cover, species diversity and the survival of plant species within the revegetated areas.

Revegetation sampling methods employed to measure the success of revegetation at the King II Mine will comply with those specified by the regulatory authority at the time of revegetation monitoring and bond release. Currently Colorado Division of Reclamation, Mining and Safety (CDRMS) Rule 4.15.11 specifies methods for use in vegetation sampling. Any of those specified methods may be employed at the King II Mine for vegetation sampling.

In consultation with the CDRMS in 2005, the big sage mixed shrubland community was delineated and quantitatively sampled. The Division agreed that a segment of that vegetation community (located outside the surface facilities disturbed area) would be utilized as a reference area for revegetation success determinations. Since the reference area was a subset of the vegetation community quantitatively sampled, there was no need for a separate statistical evaluation. The location of the reference area is shown in Figure 9-8. The reference area is signed to prohibit unauthorized access; however, it is not fenced, providing access to wildlife.

The reference area will provide revegetation success criteria for total vegetation cover and total herbaceous production. These parameters will be sampled during the same season and in the same manner as the revegetated area to establish the success criteria for total vegetation cover and total herbaceous production at the time of revegetation sampling for monitoring or bond release.

**Success Criteria: Total Vegetation Cover and Total Herbaceous Production** - Determination of revegetation success in achieving the total vegetation cover or total herbaceous production success criteria will be based on quantitative statistical means. The Student's *t*-test is a robust

statistical test to evaluate the equivalency of two sample means. This test should be employed to test the null hypothesis that the sample mean for revegetated parcel cover or production is less than 90 percent of the value of the corresponding cover success criterion. Rejection of the null hypothesis will indicate achievement of the success criteria for total vegetation cover and total herbaceous production.

**Success Criterion: Species Diversity** - Species diversity success criteria for revegetated parcels are based on the number of species, species richness, and relative abundance in native vegetation communities. Baseline vegetation cover data for the rabbitbrush/big sage mixed shrubland community were collected and analyzed to determine the dominant plant species of the community, as well as their lifeforms and seasonality. Dominance was determined through selection of species that contributed three (3) percent or more to relative cover in the baseline sampling. Six species contributed this amount of relative cover; one introduced annual cool-season grass, two native cool-season grasses, one introduced cool-season grass, and two shrubs.

Accounting for the undesirability of re-establishing an annual introduced grass, and to reflect more typical species diversity in the revegetated area, a total of six perennial plant species should be reestablished. Of these species, three should be graminoid, one a forb, and two shrubs in life form. All qualifying species should be cool season, deciduous, or evergreen. A minimum of four species should be native. Both bunchgrasses and sod-forming grasses should be represented, though no specific number of each is necessary. No single species should contribute more than 40 percent mean relative cover or less than two percent mean relative cover for graminoids or one percent relative cover for forbs in the revegetated area. Species diversity will have been successfully achieved when the above specifications are met.

**Success Criterion: Woody Plant Density** - Current woody plant density within the rabbitbrush/big sage mixed shrubland is 2,977 individuals per acre. Observation of the community indicates that the current density (particularly of rubber rabbitbrush) is overly high for the post-mining use of rangeland. Neither rubber rabbitbrush nor big sage is particularly desirable for livestock. For this reason, woody plants are not proposed for re-establishment within any area identified as within the rabbitbrush/big sage mixed shrubland vegetation community of the mine site. Woody plants are proposed to be re-established within all areas disturbed and subsequently reclaimed and revegetated within the area identified pre-mine as the pinyon-juniper vegetation community. Within the overall disturbance of 22.36 acres, approximately three acres of pinyon-juniper woodland is proposed for disturbance. When revegetating within the area identified as the pinyon-juniper woodland community pre-mine,

additional shrub species will be added to the reclamation seed mix as depicted on the seed mix table to facilitate achieving the designated post-mining land use of wildlife habitat.

In the area identified pre-mine as pinyon-juniper woodland, a woody plant density standard of 200 stems per acre is proposed. Achievement of woody plant density will have occurred, in the area identified pre-mine as pinyon-juniper woodland, when the sampled density is statistically equal to 200 stems per acre. This standard achieves an average woody density of one stem per 218 square feet (or one stem on fifteen foot centers).

(vii) A soil testing plan for evaluation of the results of topsoil handling and reclamation procedures related to revegetation.

Fertilization immediately after topsoil replacement or coincident with initial revegetation has been shown to promote weed and annual growth on reclaimed areas. For this reason, evaluation of major plant nutrient (N, P, K) concentrations will be undertaken during the second or third growing season after initial seeding. At that time, soil testing will be undertaken to evaluate the concentrations of the major and minor plant nutrients. If sampling reveals a deficiency, fertilizer will be applied at a rate based on recommendations of the NRCS or soil conservation agent. Application can be through aerial means or dry application between the rows of seedlings.

The period of extended responsibility for successful revegetation would begin after the last year of augmented seeding, fertilizing, irrigation, or other work, excluding husbandry practices that are approved by the regulatory authority. Since the King II Mine receives less than 26.0 inches of annual average precipitation, the period of responsibility would continue for a period of not less than ten years. The vegetation parameters identified in this would equal or exceed the approved success standard during the growing season of any two years after year six of the responsibility period.

(6) A description of the measures to be used to maximize the use and conservation of the coal resource as required in 30 CFR 817.59;

The engineering and design of the mine require that coal reserves be divided into sections or panels convenient for extraction and in alignment with the mains to facilitate access and extraction. Rooms (larger open areas from which coal is extracted) are developed. Coal pillars are left at the periphery of the rooms to support the main roof. The size, location, and number of rooms and pillars are determined by the physical characteristics (thickness, load bearing capability, presence of non-coal inclusions) of the coal in a given location of the mine. With the completion of a given panel or section (when all minable coal has been extracted), the

remaining pillars are mined as the operation retreats from the panel. In this way, the recovery of the coal is maximized.

(7) A description of measures to be employed to ensure that all debris, acid-forming and toxic-forming materials, and materials constituting a fire hazard are disposed of in accordance with 30 CFR 817.89 and 817.102 and a description of the contingency plans which have been developed to preclude sustained combustion of such materials;

All debris, acid-forming and toxic-forming materials constituting a fire hazard are disposed of by a local waste removal company such as Waste Management or Baker Sanitation. Grease, lubricants, paints, flammable liquids, etc. are stored in the Fuel Storage Building (Figure 9-4) with proper containment and collected on a regular basis by a certified hazardous material collection company such as Safety Kleen.

At no time would any noncoal mine waste be deposited in a refuse pile or impounding structure, nor would any excavation for noncoal mine waste disposal be located within 8 feet of any coal outcrop or coal storage area.

(8) A description, including appropriate cross sections and maps, of the measures to be used to seal or manage mine openings, and to plug, case or manage exploration holes, other bore holes, wells and other openings within the proposed permit area, in accordance with 30 CFR 817.13-817.15:

**Sealing Mine Openings** - In accordance with the requirements of our mine plan, the portals (mine openings or entrances into the King II Mine) will be backfilled and sealed against inflows of surface water and access by animals or people. Coal stockpile residue on the permit area will be scraped from the surface and used for backfill inside the portals. This will limit the presence of any potential acid-forming or toxic materials in backfilled and re-graded area and minimize potential contamination of topsoil and revegetation. The four portals are each approximately 10 feet wide by 8 feet high. To fill them to a depth of 25 feet will require about 296 cubic yards of material plus a small amount to account for sloughing at the inby end. Total portal backfill will require approximately 400 cubic yards of material. After back-filling to a depth of 25 feet from the portal, the mouth of the portals will be caved to completely seal them. The area will then be backfilled, graded and smoothed over to closely approximate the original contour of the hill into which the portals have been opened.

**Sealing Exploration Drill Holes** - Any coal exploration drill holes, vent holes, and groundwater monitoring wells (not transferred to the landowner) in the permit area will be backfilled, sealed at water bearing zones, and capped with concrete plugs to meet reclamation requirements.

Drill holes will be sealed by filling with cement to an elevation above the coal seam encounter and any water-bearing intervals encountered, then replacing cuttings or other suitable media in the hole and placing a suitable plug 10 feet below the ground surface for support of a cement plug to within 3 feet of the ground surface. The plug and drill site will be covered to a depth of six inches with topsoil that would have been stockpiled nearby during the clearing process. Tracks will be raked or brushed to remove obvious signs of activity.

The drill sites will be reseeded (unless disturbance is confined to areas previously disturbed such as preexisting roads) with seed mixes for Rangeland and, if applicable, Pinyon-Juniper as specified in Section 784.13(b)(5)(ii) above. Broadcast seeding at twice the application rate for drill seeding will be employed due to the very limited size of the disturbed areas. The seed will be covered through raking, harrowing, or mulching. Other applicable sections of Section 5.5.3 784.13 of this document will be adhered to.

(9) A description of steps to be taken to comply with the requirements of the Clean Air Act (42 U.S.C. 7401 et seq.), the Clean Water Act (33 U.S.C. 1251 et seq.), and other applicable air and water quality laws and regulations and health and safety standards.

GCC Energy, LLC has obtained permits for air emissions and point source discharges from the Colorado Department of Public Health and Environment, delegated agency for enforcement of the Clean Air act and Clean Water Act. There are no waters of the United States requiring a permit from the U.S. Army Corps of Engineers. There are no federally listed or candidate species that require a take permit, habitat conservation plan, or mitigation plan from the U.S. Fish and Wildlife Service.

#### **5.5.4 784.14(a-i) Hydrologic Information**

##### **5.5.4.1 784.14(a) Sampling and Analysis**

Several alluvial wells, an irrigation ditch, and a recently-identified seep have been monitored on the permit area, and regional data has been acquired from domestic wells. A new round of well installations in bedrock and alluvium is currently underway, triggered in part by review of the King II hydrologic monitoring programs by GCC, CDRMS, the Office of Surface Mining, Reclamation and Enforcement (OSMRE), Bureau of Land Management (BLM), La Plata County (LPC) and concerned citizen groups. GCC's pursuit of a Federal Coal Lease Modification for an expansion of underground mining operations is subject to preparation and approval of an Environmental Assessment (EA) by the BLM. This review process has determined need for a full review and analysis of existing hydrologic data for the affected area. Additionally, new or enhanced hydrologic data collection has been proposed by GCC to further the understanding of potential impacts from mining operations.

All water quality analyses performed to meet the requirements of this section have been and will continue to be conducted according to the methodology outlined in the 15th edition of “*Standard Methods for the Examination of Water and Wastewater*,” which is incorporated by reference, or the methodology outlined in 40 CFR parts 136 and 434. Water quality sampling performed to meet the requirements of this section is conducted according to either methodology listed above when feasible.

All water samples are sent to a certified lab for analysis of a suite of analytes specified by CDRMS and listed below, following standard preservation and chain of custody procedures. Splits of samples are subjected to measurement of field parameters, specifically temperature, pH, and specific conductance, and water levels in wells.

Water quality monitoring parameters being considered include:

- Field parameters: temperature, specific conductance, pH and depth to water
- Major ions: sodium, potassium, magnesium, calcium, carbonates, chloride and sulfate
- Trace elements: Iron, manganese (total, ie dissolved and suspended)

Lab analytical data are reported with quality assurance testing such as recovery spikes. All monitoring data from field and lab are subjected to quality assurance checks, including balance of positive and negative ionic equivalents, and sum of major ions compared to total dissolved solids, before entering a database.

Regional well data obtained from USGS sampling is reported as partial basis for baseline water quality, although these were sampled only once in 1987 and are not part of the GCC monitoring program in any way. This data contains more analytes including some trace metals, but quality assurance on these data are poor, because a) they are from wells not screened in discrete aquifers, and b) no lab reports are available (which might have included duplicates, spike recovery and equipment calibration data, such as are standard (and required) in modern environmental lab work). Nonetheless, internal consistencies such as detections of copper from house plumbing but absences of arsenic confer credibility and qualitative value.

**Alluvial groundwater monitoring** - Currently, the monitoring program includes the following alluvial well locations (Figure 9-11):

- King II Upgradient #1 Monitoring Well (aka Ute Mountain Ute, Permit #210372)
- King II Downgradient #2 Monitoring Well (aka National King Coal LLC, Permit #262656), near the King II portal
- King I Downgradient Monitoring Well (aka Wiltse, unpermitted), near King I portal

Newer well locations are shown on Figure 9-12. The new alluvial well has been installed and sampled once:

- Newer well Hay Gulch Upgradient, near confluence of Roberts Canyon (above King I).

**Bedrock well monitoring** - Figure 9-12 shows the locations of GCC monitoring wells being installed. There is one seep on the permit area, identified on this figure as SEEP-1, discovered in 2015 and sampled quarterly since. Results of one-time sampling of domestic wells near the permit area by USGS are reported below in baseline characterization, but there is no on-going monitoring of potentiometry or water quality in these wells.

At the time of this reporting, four monitoring well clusters are being installed in bedrock on the permit area, at locations shown in Figure 9-12. These had not been installed earlier because it was believed the coal bearing seam and its overburden were dry, in accordance with historic experience in King I and King II mines. These are expected to confirm the historic experience at King I and II and neighboring mines that the coal bearing strata and overburden are dry.

Wells within one mile of the permit area were sampled by GCC in 2013 to provide a pre-mining baseline of water quality data. Owners of those wells are identified in Table 5-2.

**Table 5-10. 784.14(a). Water quality of permitted wells within one mile of permit area**

Owner	Section	Township	Range	Depth	Rate	Permit number
Ute Mountain Tribe	SE¼SE¼ 36	35N	12W	Permit expired		210372
National King Coal, LLC	SW¼SW¼ 36	35N	12W	No data	No data	260656
John Wilson	SW¼SE¼ 6	34N	11W	No data	No data	90325VE
Charles Shafer	SE¼SE¼ 6	34N	11W	115'	7.0 gpm	92816
John Paul [well plugged 1992]	SE¼ 6	34N	11W	372'	0.5 gpm	108185
John Wilson	SE¼ 6	34N	11W	55'	15.0 gpm	173238 108185
Helen Ruth Aspaas	SW¼SW¼ 6	34N	11W	70'	15.0 gpm	197706
Bill Waters	SE¼SW¼ 1	34N	12W	180'	No data	249530

Tyler Paulek	SW¼SW¼ 1	34N	12W	Permit expired		249531
Daniel Bontrager	SW¼SW¼ 1	34N	12W	230'	4.0 gpm	189391
Randy Paulek	NE¼SE¼ 2	34N	12W	No data	No data	263365
Tyler Paulek	SE¼SE¼ 2	34N	12W	Permit expired		249532
Paul Crawford	NW¼NW¼ 2	34N	12W	339'	8.0 gpm	100453

**Spring and seep monitoring** - One seep was identified in reconnaissance conducted by RHS in December, 2015, following a directive by CDRMS to thoroughly prospect the permit area for such features. Springs and seeps are essentially outcroppings of groundwater and are indicative of groundwater conditions and susceptible to such ground deformation as might be caused by mining, as well as constituting important wildlife resources in arid regions. While no springs or seeps were previously known to exist in this area, a reasonable expectation was that if they did, they would manifest either at the base of the Cliff House or at “A” seam outcrops. These outcrops were hiked as reconnaissance over the complete permit area, and the one seep was located and documented as SEEP-1 in the gulch approximately 2 miles northwest of the King II Mine surface facilities, at the base of the Cliff House. This seep has been sampled in three quarters to date. Flow is on the order of one gallon per hour; water quality is poor but it is a wildlife wallow. Sampling of this seep will continue quarterly for no less than a total of four quarters. Assessment will occur in a reasonable time following four quarters of data collection at these locations to shape the future GCC regulatory spring and seep monitoring requirements.

**Surface water monitoring** - Surface water in the lease area is limited to the Hay Gulch Ditch, spring thaw and occasional storm runoff. The primary receptor of all surface water is the Mormon Reservoir several miles to the south. There has not typically been any water in spoil or stormwater catchment ponds to sample, except in rare storm events when flooding and gullying were regional concerns (operations personnel were unavailable to perform sampling during these events as flood control is a priority that requires all available manpower).

The typical concern of an underground mine with respect to surface water is discharge of mine water with deleterious quality. To date, the mine has been dry; a water balance assessment was undertaken in 2014 by CDS Environmental to show that mine water usage was totally consumed by bath house facilities (with wastewater going to a septic treatment system), and dust control, which water is accounted for by moisture on mined coal and vapor in ventilation air.

CDRMS directed that sampling of Hay Gulch Ditch occur up-gradient of potential mine impacts at the location shown in Figure 9-12, to complement current (down-gradient) GCC Hay Gulch Ditch water quality monitoring near the King II Mine driveway. This will allow for comparison of any variability in water quality upstream and downstream of the mine.

**Future monitoring** - Four clusters of monitoring wells currently being installed, the seep discovered in 2015, an upgradient Hay Ditch sampling point, and a new upgradient alluvial well above the King I portal will be sampled for four quarters; These data would be summarized in an addendum to any characterization in early 2018. All samples will have field parameters measured and be submitted to a certified lab for the same list of analytes as current water samples. Monitoring of alluvial wells already under way will continue.

#### **5.5.4.2 784.14(b) Baseline Information**

Hydrologic data collected in the Hay Gulch study area were compiled, analyzed, and reviewed in the *King I & II Coal Mine Area Hydrologic Study* (RHS 2016, Appendix 10.8) with focus on the potentially affected area near the GCC Energy (GCC) King I and II Coal Mines. The study's conclusions are presented below. Based on these and other data and an on-site inspection that included the preserved drainage upstream and downstream of the facility, the U.S. Army Corps of Engineers determined that the construction of the King II Mine did not require a permit under Section 404 of the Clean Water Act. Their determination also included a statement that the drainages in question do not contain enough flow to create an ordinary high water mark and are therefore not considered waters of the U.S (Appendix 10.8).

Existing monitoring well locations are shown in Figure 9-11. Proposed additional monitoring locations are shown in Figure 9-2. Seven domestic wells in the Vista del Oro subdivision just west of the King II permit area were sampled by GCC in 2013 to provide a pre-mining baseline.

#### **(1) Ground-water Information**

Regionally, aquifers include Quaternary alluvium in gulches, and three formations of the Cretaceous Mesa Verde Group. The Mesa Verde is a transgressive tongue of sediments that encroached on the Cretaceous inland sea, depositing shoreline sands (the Point Lookout Formation), shales and coals in swamps behind the shore (the coal-bearing Menefee Formation) and the regressive Cliff House Sandstone on top. The marine Lewis Shale which was laid down on top of this wedge has been removed by erosion in the permit area. In the permit area, the Cliff House Sandstone is generally unsaturated with minor perched water, the coal bearing upper Menefee is an aquitard, and the lower Menefee is a low permeability shale and siltstone sequence that may be hydraulically connected to the underlying Point Lookout, which is a fine grained and cemented sandstone with also low permeability. Domestic wells in the

area target the lower Menefee, and commonly cross into the upper Point Lookout to achieve adequate yield. There are no domestic supply wells completed in alluvium, where the groundwater quality is poor, with high total salts and specifically high sulfate concentrations in most reaches.

**Alluvial Groundwater** - Alluvial groundwater is present in the unconsolidated sediments in the ephemeral stream systems. These alluvial sediments are themselves a stream of eroded solids, which are mostly composed of fine sand from the Mesaverde sandstones and silt and clay from the shales. Alluvium in the upper reaches of drainages typically are not saturated, whereas the lower reaches of drainages, such as Hay Gulch, are saturated with seasonal fluctuations in the water table from near surface (spring) to greater than 6 feet below ground surface (fall-winter). Alluvial aquifers in the study area are not known to have any substantial or extensive clay cover (loess), as would be present in recent glaciated terrains, and are therefore characterized as unconfined. They do contain some thin, lenticular gravel channels.

The presence and character of alluvial groundwater in the study area are documented in publicly available well construction reports for domestic or commercial installations or facility monitoring wells. The La Plata River alluvial aquifer at the eastern margin of the study area is very productive with hundreds of permitted domestic water wells that Colorado Division of Water Resources (CDWR) Well Construction and Test Reports indicate yields up to 65 gallons per minute (gpm). Similar records for the domestic water wells in the Cherry Creek alluvium, which forms the western boundary of the study area, indicate yields up to 30 gpm. In contrast, the ephemeral drainage alluvium throughout the study area has been developed for groundwater resources to a much lesser extent. This is likely because: 1) these are not densely populated areas so demand for groundwater is relatively low; 2) the water quality of these alluvial aquifers may be known locally to be poor (high sulfate concentration affects taste and is emetic); 3) yield may be low because of the presence of clay, and a short saturated interval; and 4) alluvial water is tributary to the over-appropriated La Plata River and new permits are unlikely to be issued.

The Hay Gulch alluvial aquifer now has four wells monitored by GCC as groundwater compliance monitoring locations. While no formal DWR Well Construction and Test Reports exist for these wells, it is known that the well depths are up to 20 feet below ground surface, and therefore indicate an alluvium thickness of at least 20 feet in those locations. The quarterly measured water level at these locations is within ten feet of the ground surface; the hydraulic gradient or slope of the water table essentially parallels the valley bottom. A hydrograph of these alluvial groundwater levels, measured quarterly, for the period of record is

presented as *King I & II Coal Mine Area Hydrologic Study* (RHS 2016, Appendix 10.8, Figure 4-8), plotting groundwater elevation (ft amsl) versus time. Seasonal fluctuations are evident.

Records of six hand-dug alluvial wells, located downgradient from the King II mine in the southern reach of Hay Gulch, were found during the DWR Well Construction and Test Report review. These wells were constructed as early as 1924 and range in depth from 13 to 35 feet. No formal aquifer tests, such as pumping tests or slug tests, are known to have been conducted at any of these wells to estimate hydraulic conductivity or specific storage parameters. No records of informal well tests to calculate specific capacity appear to exist. Water quality in these hand-dug alluvial wells is considered suitable for stock or drinking water in places (near the King II surface facilities, for instance), but contains high sulfate in other locations (for instance near the King I portal). Sulfate derives from oxidation of iron sulfides in weathering of the Menefee Formation especially.

Along the western margin of the current King II underground workings, East Alkali Gulch alluvium appears to have spatially limited saturation as only one DWR-permitted water well (#268168) has been successfully completed in gravel to 100 feet depth. However, another DWR-permitted water well (#268278), located approximately 675 feet downgradient, was dry through the alluvium and was completed in the underlying Menefee Formation shale. This pair of wells could be useful for further study to gain a better understanding of any possible alluvium/bedrock interconnection with the Menefee Formation.

The named and unnamed ephemeral drainages that make up East and West Roberts Canyon to the east of proposed King II workings do not have any reported DWR water wells. Therefore, the presence and extent of alluvial saturation is unknown.

The Wiltse well, GCC Well#1 Upgradient, and GCC Well#2 Downgradient wells are completed in Hay Gulch alluvium, with the Wiltse well located near the portal of the King I Mine, GCC Well#2 (as it will be abbreviated here) located near the King II surface facilities, and GCC Well#1 Upgradient located approximately halfway between. It was noted above that there is significant variability in the TDS of the GCC Well#2, and that the Wiltse well exhibits a much higher TDS than the other two wells, however it is declining with time. Some of the variability in the GCC Well#2 may be due to dilution by runoff off the ridge overlying the King I Mine. The high TDS observed in the Wiltse well may potentially be related to the mine spoil pile located upstream of the well, or anywhere along the reach from King I Mine (which opened in 1938) to the head of Hay Gulch. The Wiltse data are only those analyses for which there was a “full” analytical suite, which was initiated in 2011, five years after the King II Mine was opened. Sampling of this well began in February of 1982, when TDS was reported at 2,130 mg/L and sulfate at 1,160 mg/L. It can be seen in *King I & II Coal Mine Area Hydrologic Study* (RHS 2016, Appendix 10.8)

Figure 4-9 that TDS and sulfate have decreased almost 50% over the longer period, and continue to decline.

The velocity of a potential solute plume (of a conservative, not readily adsorbed constituent such as sulfate) in the alluvium may be estimated by Darcy's law, which states bulk velocity = hydraulic gradient times hydraulic conductivity ( $q = i \times K$ ), and pore velocity is the bulk velocity divided by porosity (since water flows only in the pores, not the whole medium; this leads to  $v = i \times K/n$ ). Hydraulic gradient ( $i$ ) is approximately equal to the valley floor slope, or 10 ft per mile. Porosity ( $n$ ) may be assumed to be 0.3, and hydraulic conductivity ( $K$ ) somewhere between 5 and 10 ft/day (given it is largely fine to medium-grained sand derived from Mesaverde sandstones with some clay from shales and minor gravel lenses). This gives a pore velocity of 23 feet per year (at the higher conductivity value), or one mile in 230 years. It is about 10,000 feet from King I to King II portals (GCC Well#1 to GCC Well#2), which the groundwater would cross in about 500 years. Given the climatological record inferred from tree rings (Funkhouser et al, 2002), it is likely that strong variations in salinity should occur in alluvial water over this distance. Such variation would be partly stratified and partly piston pulses. There is almost no information available to assess such variability, except that the climatological variation does propose a possible natural cause for the variation in salinity shown below, and suggest a need for further study to identify the source of the increased sulfate and TDS observed in this well.

*King I & II Coal Mine Area Hydrologic Study* (RHS 2016, Appendix 10.8) Figures 4-10 through 4-12 show the major ion composition of the three alluvial wells in stacked bars, with TDS and pH presented as line plots. TDS values should exceed the sum of the major ions represented, however TDS does not match the sum of constituents in some cases because parameters potassium and chloride were not analyzed. On the plots showing GCC Well#1 and GCC Well#2, the TDS is close to the sum of major ions in most samples, indicating there is not much potassium or chloride present, and the difference between TDS and the bar sums is an indicator of data precision (adequate). On the Wiltse plot, the TDS value is always greater than the bar sum, suggesting there is some chloride present. The missing analytes make trilinear plots of  $[Ca-Mg-(K+Na)]$  and  $[HCO_3-SO_4-Cl]$  impractical, however the comparison of TDS and sum of the analyzed ions show K and Cl are minor.

The highest sulfate levels in the alluvium may make the water mildly emetic but do not disqualify it as drinking water. All alluvial groundwater contains total dissolved solids in excess of the secondary drinking water standard of 500 mg/L, promulgated by EPA.

Few trace elements have been analyzed in alluvial groundwater of Hay Gulch, but manganese has been, as a constituent of common concern in coal region waters. The range of manganese concentrations in all samples from the three alluvial wells, GCC Well#1, GCC Well#2 and Wiltse,

are shown in *King I & II Coal Mine Area Hydrologic Study* (RHS 2016, Appendix 10.8) Figure 4-13. Results reported as less than detection limits are represented as zero in this plot. *King I & II Coal Mine Area Hydrologic Study* (RHS 2016, Appendix 10.8) Figure 4-13 shows that a single sample was reported with 2.5 mg/L dissolved manganese, and most were less than 1 mg/L. Health effects from manganese in drinking water are a concern at concentrations higher than 0.5 mg/L.

**Bedrock Groundwater** - The discussion of bedrock groundwater in this section is organized by geologic formations as presented in Section 3, and is based on data collected from wells located to the south of the coal properties. In fact, there are no known saturated aquifers or domestic wells in the coal leases area. The limited number of bedrock groundwater studies within the study area completed to date do not allow for a detailed delineation of the hydrostratigraphy at this time. While GCC holds a large body of detailed geologic information, the data collection is for the purposes of coal resource evaluation. The exploration boreholes extend through the mining target “A” and “B” coal seams, however this interval has been demonstrated to be dry with no aquifers intercepted. The domestic water wells in the area are open over very large intervals, many more than 400 feet, to maximize yield. Such wells are typically not limited to one formation and do not allow for definitive correlation of hydrostratigraphic units from well to well.

*King I & II Coal Mine Area Hydrologic Study* (RHS 2016, Appendix 10.8) Figure 4-4 shows locations of all registered wells within two miles of the permit area, and Figure 6-1 shows registered wells up to six miles from the permit area. These are all domestic water supply wells except for those located in the alluvial valley of Hay Gulch, which are project monitoring wells. Table 5-2 gives ownership of those wells within one mile of the permit area.

**Cliff House Sandstone** - The Cliff House is known regionally to be an aquifer with wells reportedly producing as much as 17 gpm with an average closer to 10 gpm. Estimated transmissivity values are on the order of 2 ft<sup>2</sup>/day where it is water bearing (Brooks, 1985), which is low for a thick sandstone, but it is fine grained and cemented. In the study area, this formation is not saturated due to its position as lobate ridge caps. These topographic features, locally referred to as mesas, generally range from ½ to 1 mile in width and a few miles long. In the northern part of the study area, generally north of Hay Gulch and in the several-mile vicinity of the King II mine, these Cliff House ridges are isolated on all sides with outcrop exposures including at the northern side of Hay Gulch. They are isolated from any potential alluvial recharge, and receive only direct precipitation recharge. Some perched water bearing lenses have been identified during GCC mining operations. These have presented as minor leakage at the roof, with drainage on the order of several gallons over several minutes, probably coming

from the Cliff House on cracks. Geological mapping shown in *King I & II Coal Mine Area Hydrologic Study* (RHS 2016, Appendix 10.8) Figure 3-1 demonstrates that the local terminus of any potential Cliff House groundwater is the Quaternary La Plata River alluvium. The Cliff House mesa tops typically have five or more feet of soil cover, based on review of drilling reports for this study, and have pinon-juniper cover which is dense in gullies and sparse between them, indicating limitation by water availability and hence a low infiltration. A single small seep discovered in 2016 issues from the base of the Cliff House where intersected by the gulch above the King II portal, the singularity of this feature further attesting to the general dryness of the formation.

Menefee Land Company conducted an exploration program for a proposed coal mine bordering the King mine, and their reports stated that no water was encountered in any drill hole, and all Cliff House wells were dry.

**Menefee Formation** - Regionally, the lower Menefee is known to be an aquifer with well yields as much as 15 gpm. Estimated transmissivity is 50 ft<sup>2</sup>/day or less. This possibly includes the local study area; however, many domestic wells are completed across multiple water bearing intervals and at least some are suspected to be producing in part from the upper Point Lookout. No formal aquifer tests such as pumping tests or slug tests are known to have been conducted within the study area to estimate parameters such transmissivity or storage. No records of informal well tests to calculate specific capacity appear to exist.

The upper Menefee, the interval targeted in the study area for coal mining, is not known locally or regionally to be an aquifer. This interval is known locally to be unsaturated based on the review of extensive exploration drilling and mining regulator reports. The basal Menefee is considered an aquifer in some areas, generally in the southern portion of the study area where the formation is thicker and deepens with the regional 2- to 3-degree dip of the Mesaverde Group. This interpretation is based on comparison of detailed geologic information from GCC logs against DWR Well Construction and Test Reports. Coal seams, especially in the arid western US, are often aquifers where permeability is conferred by cleat (fracture) sets, whereas shales and cemented sandstones in the coal-bearing sequence commonly have low yield, with low water quality because of long residence times.

In the northern part of the study area, there are areas where the upper Menefee outcrops, exposing the "A" seam. To the far north in the study area, substantial outcrops are the primary groundwater recharge areas for the lower Menefee. The upper Menefee is incised like the Cliff House but is less permeable, and so is essentially dry except for rare pockets of fossil water in sand lenses, as observed in mining to date. No springs or seeps from the Menefee are known to occur in the permit area. Recharge of the Menefee from the overlying Cliff House is insignificant

because the Cliff House is essentially dry and the upper Menefee an aquitard. As with the Cliff House in this area, the “A” seam outcrop of the Menefee is above the gulch alluvial floor where alluvial groundwater might contribute any recharge. The “A” seam outcrop in relation to drainages is presented in numerous figures in this study. Proposed East Alkali Gulch water wells, one completed in the alluvium and one in the immediately underlying upper Menefee formation, are likely to confirm lack of hydraulic connection between the two.

Extensive drilling data compiled by GCC south of Hay Gulch for King I coal exploration of the “A” seam and the “B” seam approximately 80 feet below ground surface encountered no ground water. South of King I, numerous domestic water wells were identified for this study through DWR Well Construction and Test Reports. As discussed previously, these records have limited utility because of the long completion interval, effectively co-mingling all water bearing intervals intercepted by the borehole. Detailed geologic cuttings descriptions and/or geophysical logs were not completed and therefore a definitive correlation of the coals from the GCC records to the DWR records is not possible.

To date, the Durango UMTRA site hydraulic testing is the most extensive data on Menefee permeabilities. The geometric mean of slug test assessments of hydraulic conductivity in the formation was 0.009 ft/day, which is higher than for, say, Mancos or Lewis Shales, but qualifies the Menefee, particularly the upper, as an aquitard. Lower Menefee where it contains siltstones is likely to be hydraulically connected to the underlying Point Lookout.

Many, if not most, domestic water wells in the area cross connect more than one water bearing interval, rendering it difficult to analyze Menefee hydraulics or water quality. Of 179 wells in the study area, 114 are likely to include the “A” seam coal in their effective open interval behind PVC casing below the surface cement seal, and the open intervals are on average 290 feet long, and up to 1,548 feet. Many evidently tap into the Point Lookout Formation.

Limited bedrock groundwater chemistry data for wells including the Menefee exist that are relevant to the study area, including domestic well installations in the Vista del Oro subdivision west and southwest of King II in the study area, and a 1983 USGS sampling program investigating domestic wells over a broader regional area. Menefee bedrock groundwater analytical data are available from multiple samples of the Haugen well, as well as one-time samples from several other domestic wells.

The Haugen well is located near the confluence of Pine and Hay Gulches. The other domestic wells and USGS sample points are all within T34N and 35N, R 11W and 12W. All of these wells are completed in coal bearing strata of the Mesaverde Group, and all of the wells for which completion data are available include coal seams in their open intervals.

Bar plots of water quality are given in *King I & II Coal Mine Area Hydrologic Study* (RHS 2016, Appendix 10.8) Figures 4-14 and 4-15, the first plot providing data for those wells with only a single analysis and the second plot data for the Haugen well with several analyses. The TDS (total dissolved concentrations) should be slightly higher than the sum of the major ions, and the DWR permit #251673 well analysis indicates an inconsistency in the dataset. Three of these wells show relatively high sulfate concentrations, while two wells show very low sulfate which might suggest reduction to sulfide (and presence of hydrogen sulfide in the well). Further data collection would be needed to confirm the presence of any reduced sulfur species in the wells where low sulfate content was observed. Sulfate and sulfide in are common complications in infrequently-pumped wells completed in coal bearing intervals, by allowing oxidation of pyrite in coal to sulfate through air contact, and subsequent reduction to hydrogen sulfide if the coal also leaks methane to the wellbore, even if neither sulfate nor hydrogen sulfide is detectable in the coal or well when newly completed.

Data in the Haugen well analyses, shown in *King I & II Coal Mine Area Hydrologic Study* (RHS 2016, Appendix 10.8) Figure 4-15, suggest a couple of years of purging was necessary to clear up drilling fluid residual, evidenced by a decline in TDS and minor sulfate, and stabilizing as a sodium bicarbonate water with a pH near 8.

USGS data from the “NBO” series of wells has apparent missing pH values for many samples, and TDS values highlight data inconsistencies (6th well from the left in *King I & II Coal Mine Area Hydrologic Study* [RHS 2016, Appendix 10.8] Figure 4-16). Groundwater data collected from the “NBO” series of wells indicates low sulfate, with the other constituent values consistent with the sodium bicarbonate groundwater observed in other Mesaverde wells, indicative of groundwater that has not been impacted by mining activities.

Trace element analysis of groundwater samples was incorporated in the USGS sampling of the NBO wells. These analytes are used to establish a chemical fingerprint of each groundwater and determine the geochemical processes affecting groundwater quality at depth.

*King I & II Coal Mine Area Hydrologic Study* (RHS 2016, Appendix 10.8) Figure 4-17 includes trace element analyses for 40 NBO samples reported by USGS within six townships centered on Hay Gulch. Analytical results reported less than detectable are represented in these figures as zero (the first “bin”). The constituents shown include arsenic (As), fluoride (F), selenium (Se) and silica (SiO<sub>2</sub>), which are likely to represent natural ranges of these constituents in Mesaverde groundwater, and copper, which may not. Arsenic and selenium are likely to originate from sulfides (pyrite) oxidation but migrate on different geochemical trajectories and concentrations do not correlate directly with sulfate or one another. Fluoride is likely to be a significant trace element in Ca-Mg carbonates in Mesaverde sandstone. Silica concentration

tends to correlate with depth since its solubility is primarily controlled by temperature, and it has a roughly normal distribution for the range of well depths. All other trace elements represented are biased toward the detection limit. Copper, lead and iron (the latter two not shown) are probably due to the plumbing systems in domestic wells from which samples were taken, and are scattered and do not correlate with any other water quality parameter.

While the distributions of trace elements represented in *King I & II Coal Mine Area Hydrologic Study* (RHS 2016, Appendix 10.8) Figure 4-17, and major ions in Figure 4-14 through Figure 4-16, show a range of constituents that may be expected in wells completed in the Mesaverde strata in this area, they do not indicate any mining impacts. The mining activity in this area has occurred in dry seams isolated from lenses of overburden water and confined underburden formation water, and there is no discharge of mine supply water (applied for dust control) to any surface or groundwater body. The data shown here represent the variability in water quality in bedrock wells due to natural interactions of infiltrating water with bedrock and some perturbations due to imperfect well completions, particularly wells intersecting coals and allowing communication between aquifers of different character.

**Point Lookout Sandstone Formation** - The Point Lookout Sandstone Formation is known to be a productive aquifer where extensively fractured in the upper homogenous, massive, medium-grained sandstone. The basal Point Lookout has low porosity and permeability and is not considered an aquifer. Transmissivity has been reported 240 ft<sup>2</sup>/day in New Mexico. As with the alluvium, Cliff House and Menefee, no aquifer testing has been conducted in the study area to determine the basic aquifer coefficients of transmissivity and storage. There are no wells in the study area exclusively screened in the Point Lookout aquifer, although some wells are partly screened in it (and the lower Menefee), so that neither potentiometric elevations, yield nor water quality of the Point Lookout can be properly assessed.

The Point Lookout outcrops only in the furthest northern part of the study area. The geologic mapping in *King I & II Coal Mine Area Hydrologic Study* (RHS 2016, Appendix 10.8) Figure 3-1 shows the areas of outcrop which are expected to be its groundwater recharge areas. The 2- to 3-degree dip of bedding generally to the south to a depth that coincides with many reported domestic water well DWR records. It is likely that many or most of the deep bedrock water wells in the study are drawing water from the Point Lookout aquifer. It is also likely that the upper Point Lookout aquifer is hydraulically connected to the sandstones, siltstones and shales present in lower Menefee. Geologic log data recorded on DWR Well Construction and Test Reports typically do not distinguish this formation contact, which is not a simple lithologic boundary but an interfingering of deposits of shoreline sands and the bogs and channels behind them.

While Point Lookout wells are difficult to distinguish from DWR well report geologic log data, produced water would be expected to have high salinity (from long residence times and cement-reduced permeability) and high sulfate and chloride concentrations from seawater residuals.

Groundwater in the Point Lookout is confined in the permit area, that is, water will rise above the formation in a well that penetrates it. As discussed below it is unclear what upward pressure this aquifer exerts (because of the cross penetration of domestic wells), but it is confined by the upper Menefee. Hydraulic testing done under the UMTRA program at Durango found a mean vertical conductivity of 0.009 ft/day for the upper Menefee, higher than marine shales but low enough to qualify it as an aquitard, a low permeability layer preventing upward leakage from the Point Lookout, which is consistent with an absence of wet floors in area mines.

## **(2) Surface-water Information**

Surface water in the study area, and specifically the vicinity of the King I and II mines, is very limited. No perennial streams or otherwise natural bodies of water exist in the Hay Gulch watershed, a tributary to the La Plata River. The meandering distance of Hay Gulch from the portal of the King II Mine to the confluence of the La Plata River is approximately 8 miles. Just upstream of that confluence is Mormon Reservoir, an approximate 26-acre reservoir constructed in 1910 for irrigation water. The approximate capacity of this reservoir is 1100 acre-feet and it is a stockholder-owned project.

Based on surface water data and an on-site inspection that included the preserved drainage upstream and downstream of the facility, the U.S. Army Corps of Engineers determined that the construction of the King II Mine did not require a permit under Section 404 of the Clean Water Act. Their determination also included a statement that the drainages in question do not contain enough flow to create an ordinary high water mark and are therefore not considered waters of the U.S (Appendix 10.8).

There will be a stream buffer zone under the major gulch extending northeasterly from the portal, and including SEEP-1. This is evident as a broad swath of no mining in any of the maps (such as *King I & II Coal Mine Area Hydrologic Study* [RHS 2016, Appendix 10.8] Figure 5-1) showing the proposed mine expansion. This separation of east and west panels guarantees there will be no subsidence under this (dry) drainage, no cracking of the Cliff House Sandstone under the alluvium and probably no impact to SEEP-1.

The Hay Gulch Ditch is diverted from the La Plata River at Hesperus, CO east of Hay Gulch. From the head of Hay Gulch it splits to go down into Hay Gulch and a lateral feature called

Huntington Ditch which continues south approximately one mile and then turns west across the mesa over the King I mine. The Huntington Ditch continues westward beyond the King I mine workings to a small pond that drains toward the Huntington Pipeline. The pipeline was installed in the late 1980's or early 1990s. As a precaution, GCC lined a section of the ditch, just west of the pond, in an area which had been mined at depth. The ditch runs year-round and continues westward to just south of King II surface facilities, where it drops off the hill and feeds ranch property below.

Approximately 14.07 acre-feet of water is acquired by GCC from the Huntington Ditch each year for mining dust suppression and bath house facility operations. The water is purchased from a commercial water provider in accordance with the Colorado District Court Water Division 7 (Decree 07W100, April 20, 2011). The water is totally consumed by the mine, bath house water being treated by septic system on site and dust suppression water being carried as vapor by ventilation. A water balance study by CDS Environmental Service in 2014 (*King I & II Coal Mine Area Hydrologic Study* [RHS 2016, Appendix 10.8] Appendix A) showed ventilation air vapor was sufficient to account for all of the dust control stream, within the margin of error of measurements (comparing metered water pumped to dust control, moisture content of coal in the seam and at mine mouth, and vapor in ventilation air entering and leaving the mine). This water balance accords with the historical absence of inflow to and discharge from the mine. Of 24,893 metered gallons of water entering the active mine each day, 58% left as moisture on mined coal, 40% left as vapor in ventilation, and the remainder (122 +/- 218 gallons) may be margin of error, whether it has physical reality as capillary retention in road beds, or atmospheric moisture variability, or is just the practical limit of precision of measurement of variables.

The contribution of groundwater to surface water is expected to be low, temporary and possibly only occurring during abnormally high precipitation years. This topic is discussed in more detail in the following sections regarding interconnection of surface water, alluvial groundwater and bedrock groundwater. It is evident from the density of pinon juniper trees at surface, dense in gullies and sparse between them, that vegetation is strongly limited by soil moisture, and infiltration to bedrock is vanishingly small.

Because of the arid climate and lack of perennial streams, natural surface water in the study area is therefore limited to stormwater runoff. Winter and spring snowmelt as well as flash flooding resulting from thunderstorms feed the receiving drainages during these events. La Plata County maintains hydrologic structures such as ditches, culverts and headwalls along the County roads within the study area to control and minimize effects of stormwater runoff. GCC also maintains engineered stormwater diversion and collection structures including ditches,

culverts, and retention basins within King I and II Mine permit areas. These structures are in part required to meet standards for a facility wastewater discharge permit issued by Colorado Department of Public Health and Environment (CDPHE). This permit addresses effluent and stormwater discharges, and imposes significant monitoring, inspection, and maintenance requirements.

Surface water quality data for the area is very limited, due to the infrequent flow. Hay Gulch Ditch is an irrigation ditch sourced outside the catchment, with some spreader dikes following the valley floor, gaining considerably during storm events from side tributaries such as Pine Gulch. The ditch effectively empties into Mormon Reservoir at a distance approximately 8 miles below the King II Mine. Only one water sample analysis from 1975 is available from the Mormon Reservoir, and quarterly compliance samples are collected from the Hay Gulch Ditch. Water quality data from the Mormon Reservoir sample and average water quality data from Hay Gulch Ditch were compared to alluvial groundwater composition, as represented by samples collected from the Wiltze well and alluvial GCC Well #2 Downgradient. Water quality in the Mormon Reservoir appears to be most like the alluvial groundwater composition exhibited in the Wiltze well, with additional evaporative concentration. Both the Wiltze well and Mormon Reservoir appear to have some chloride, showing as the difference between sum of major ions (except chloride) and TDS. Water quality in the alluvial GCC Well #2 Downgradient also indicates relatively low salt groundwater. Analyses of the Hay Gulch Ditch indicate relatively dilute, fresh water from the La Plata River. It is discussed in Section 4 how salinity varies in the Hay Gulch alluvial aquifer, and potential sources of increased sulfate and TDS observed in the Wiltze well.

### **(3) Supplemental information**

Based on surface water data and an on-site inspection that included the preserved drainage upstream and downstream of the facility, the U.S. Army Corps of Engineers determined that the construction of the King II Mine did not require a permit under Section 404 of the Clean Water Act. Their determination also included a statement that the drainages in question do not contain enough flow to create an ordinary high water mark and are therefore not considered waters of the U.S (Appendix 10.8)

The probable hydrologic consequences described in paragraph (e) of this section below do not indicate that any adverse impacts are expected to hydrologic balance or water quality on or off the permit area from mining activities or disposition of acid or alkali generating materials, and thus, no supplemental information is attached to address such instances. Any unexpected impacts that might occur would be identified by monitoring and reported to the agency and mitigation measures would be designed at that time.

#### **5.5.4.3 784.14(c)(1-3) Baseline Cumulative Impact Area Information**

The baseline cumulative impact area for the proposed permit area is entirely within the catchment of Hay Gulch, whose geology and hydrology have been extensively described as part of section 784.14(a-b).

#### **5.5.4.4 784.14(d) Modeling**

The use of modeling techniques, interpolation, or statistical analysis techniques has not been included as part of this permit revision application since no water resources have been identified that could be better described by any model. Ground-water information will be collected as part of the monitoring well program described under Section 784.14(a).

#### **5.5.4.5 784.14(e)(1-3) Probable Hydrologic Consequences Determination**

The current application for expansion is for an existing room-and-pillar coal mine into adjoining panels. The operator, GCC, has operated this mine and the King I Mine on the other side of Hay Gulch, in the same seam, for almost 20 years. This experience adds significant confidence in the understanding of the probable hydrologic impacts of the expansion, which is also extended by an expansion of the monitoring program (several new monitoring well clusters are being installed at the time of this application, and new data will be incorporated as addenda). It is anticipated that the new data will confirm earlier baseline characterization, that the potential for impacts from the King II expansion to the hydrology of the permit area and vicinity is not significant.

The target coal is a high grade metallurgical coal in a tongue of sedimentary strata laid down by advance and retreat of a shoreline of the inland sea that occupied the western interior of North America in the Cretaceous. The wedge of shoreline sandstone (the Lookout Point Sandstone), swamps behind the coastal barrier (the Menefee Formation containing shales and some coals), and the overlying Cliff House Sandstone deposited as the shoreline receded, overly the marine Mancos Shale and underlie the Lewis Shale (though the Lewis is eroded away near the King mines). The gently tilted strata are moderately dissected in the area of interest by ephemeral drainages cut into the Menefee Formation, with ridges capped by the Cliff House Sandstone. King II portals are driven directly into the target “A” seam, off Hay Gulch and above the elevation of its alluvial valley floor. Both mines have single portal areas. Mining height is approximately equal to the seam thickness so there is very little waste rock, and what there is is presently staged with containment near the King I portal.

Bedrock aquifers in the area are the lower Menefee, which contains some sandstones and coal, and the Lookout Point. Many domestic wells in the general area are screened across the two, to achieve sufficient yield of poor to acceptable water quality. There are no municipal wells in the

area, nor water resources which would support them. The Cliff House is unsaturated in the area and there are no wells completed in it, though some perched water supports small transient roof inflow to the mine, and one seep discovered in 2016 with poor quality and a flow less than a gallon per hour, but significant to wildlife (seasonally it is a wallow). Both Cliff House and point Lookout sandstones are fine grained and somewhat cemented, and have low permeabilities even where they are saturated. Lateral flow in the Cliff House from recharge at higher elevation is precluded by its long ridge cap exposure between steep gulches on most sides.

There are no alluvial domestic wells in the area, that water having undesirably high salts concentrations. GCC maintains several monitoring wells in the Hay Gulch alluvium, upgradient of King I and downgradient of King II portals, and in between.

The only surface water in the mine area is an irrigation ditch (Hay Ditch) which imports water into the catchment from the La Plata River to promote pasture via spreader dikes, and the single seep.

A branch of the Hay Ditch is routed via ditch and pipeline to furnish water to the King II mine. All the water use at the mine is consumed by bathhouse facilities (which have underground septic waste capture) and dust control. Apart from the very small occasional roof seeps there is no mine inflow, and the mine discharges no water.

Surface facilities (buildings and work areas near the portals) are isolated by diversion ditches to capture sediments from storm events through the operational period. The pond is designed to contain the modeled sediment of nine, 25-year, 24-hour storm events. Annual inspections of the pond and residual capacity, and regular inspections of diversion structures, are part of the regular monitoring program.

Potential hydrologic impacts of mines typically considered are diminution of groundwater resources by diversion, damage to existing water wells, or contamination through either mine discharge or leachates from waste.

- There is small likelihood of diminution of groundwater. The overburden is essentially dry, and there are no mine inflows to date other than transient roof drips.
- The upper Menefee containing the target coal is an aquitard, the coal itself is dry and there are no floor or wall seeps. Existing domestic wells source aquifers below the mine interval, and with water levels below the mined seam.
- There has been no subsidence over mined panels in the past due to the competence of the Cliff House Sandstone roof, except that some minor cracking

has been observed at surface. There are no gulches whose water is liable to diversion by subsidence. There will be no impacts to alluvial groundwater since there is no mining under alluvium (the seam is everywhere above the valley floor).

- The mine currently discharges no water, and is unlikely to generate any leachate which will reach surface in the future as a gravity discharge. Mine water use will desist when operations cease.
- Waste rock is not staged in valley fill where it might be subjected to leaching (and generation of acidity by oxidation of pyrite). The very small amount of waste rock generated is staged in a pile with ditch and sediment pond containments, and the leachate potential (and its acid/alkali generation) are currently being quantified by drilling and lab analyses. No acidity has been observed to date, indicating oxidation of pyrite is probably balanced by dissolution of calcium carbonate in the waste.

A hydrology reclamation plan is currently limited to the abandonment, recontouring and vegetation of surface facilities such as portals, offices and maintenance buildings, and diversion ditches and the pond. The monitoring of groundwater and surface water will continue to the reclamation phase, and any adverse impacts that might occur, unforeseen, will be responded to appropriately through communication with the agency and approval of mitigation plans.

There are no other active mining operations in the area (there were several historic small mines directly off upper Hay Gulch), and so the cumulative hydrologic consequences of the King II expansion in the catchment are also not susceptible of prediction.

#### **5.5.4.6 784.14(f)(1) Cumulative Hydrologic Impact Assessment (to be provided by OSMRE)**

The OSMRE will provide an assessment of the probable cumulative hydrologic impacts (CHIA) of the proposed operation and all anticipated mining upon surface- and ground-water systems in the cumulative impact area based on the evidence provided in this permit application and their own perspective of future mining activity. The CHIA will be sufficient to determine, for purposes of permit approval, whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The OSMRE may allow the applicant to submit data and analyses relevant to the CHIA with the permit application.

#### **5.5.4.7 784.14(g) Hydrologic reclamation plan**

Monitoring to date has not indicated any need for a hydrologic reclamation plan other than restoration of the surface after mining.

When the mine is closed, and sealed and surface facilities are removed, and CDRMS subsequently determines monitoring is no longer required under the plan for the active period, monitoring wells will be abandoned according to standard practice; surface pipe and pads will be removed, a grout seal will be placed in the open interval and a surface plug of at least five feet will be placed, with the interval between filled with either grout or inert material. Soil areas under removed pads will be seeded.

When the surface facilities disturbed areas are revegetated the sediment pond will be reclaimed. Sediments will be sampled and tested for leachate acidity. Discharge works will be removed and the pond berms will be graded in to bury them, and the graded surface will be reseeded. A riprap channel will be left down the axis of the pond to connect to the natural channel in the “meadow”.

#### **5.5.4.8 784.14(h) (1-2) Groundwater monitoring plan**

The groundwater monitoring program that is described in 784.14 (a) Sampling and Analysis, including the monitoring of additional wells currently being added, represents the groundwater monitoring plan for the duration of mining this permit expansion. Four alluvial wells up-gradient of the King I Mine to below the King II portal and newer bedrock wells, dry or producing water, will be sampled quarterly through the duration of mining and reclamation, sampling meaning measurement of field parameters and submittal of water samples where available to a certified lab. Data will be reported quarterly to CDRMS and a summary report submitted to OSM upon availability.

#### **5.5.4.9 784.14(i) (1-3) Surface water monitoring plan**

The surface water monitoring program that is described in 784.14 (a) Sampling and Analysis, including the sampling of the Hay Ditch above and below the King II Mine, and of SEEP-1, represents the surface water monitoring plan for this permit application. These waters will be sampled quarterly through the duration of mining and reclamation, sampling meaning measurement of field parameters and submittal of water samples where available to a certified lab. Data will be reported quarterly to CDRMS (the monitoring report will cover surface and groundwater) and a summary report submitted to OSM upon availability.

#### **5.5.5 784.15 (a-c) Reclamation Plan: Land Use Information**

The proposed post-mining land uses of the proposed permit expansion area are the same as the pre-mining land uses; rangeland, wildlife habitat, and undeveloped land. The post-mining land uses will be achieved through demolition and removal of buildings and mining related structures (including coal), backfilling and grading of the surface facilities area to a post-mining

topography consistent and complimentary to the surrounding topography, replacement of topsoil, and revegetation of the entire mining related disturbance area.

The reclamation plan has been developed to provide a post-mining topography and vegetation community equivalent or better than that there currently. Verification of the utility and capacity of the post-mining land use to support equivalent uses will be undertaken through comparison with the reference area, established to represent the pre-mining condition and utility of the site. Currently, there are no planned uses or land use policies in force for the project area. The reclamation plan has been designed to require no support activities after completion, except for normal management practices (weed control, stock rotation, or others). The reclamation plan is consistent with the requirements of the landowner lease.

GCC Energy, LLC does not propose to change the post-mining land uses from the pre-mining land uses.

#### **5.5.6 784.16 (a-f) Reclamation Plan: Siltation Structures, Impoundments, and Refuse Piles**

No siltation structure, water impoundment, and coal processing waste bank, dam, or embankment is proposed within the permit area or lease modification area.

#### **5.5.7 84.17(a) Protection of Public Parks and Historic Places**

There are no publicly owned parks or any places listed or eligible for listing in the National Register of Historic Places within the permit or adjacent areas that may be adversely affected by the underground coal mining operations (See Appendix 10.5).

#### **5.5.8 784.18 (a-b) Relocation or Use of Public Roads**

No surface or underground coal mining activities are proposed within 100 feet of a public road, except where the mine haul road joins the public right-of-way. No relocation of any public road is proposed under this permit application package.

#### **5.5.9 784.19 Underground Development Waste**

During normal underground mining operations, shale and sandstone break away from the roof and floor of the coal seam. This material will be removed from the King II Mine and placed in the existing approved mine waste (refuse) storage area at the King I Coal Mine. All mine refuse is being constructed into a waste bank. Coal mine waste (refuse) storage area has increased approximately 500 cubic yards per year. As of July 2016, approximately 174,000 cubic yards exist. Anticipated refuse production from 2017 through 2022 is approximately 5,000 cubic yards per year. The waste bank is currently designed to accommodate up to 1,000,000 cubic yards. Details of design and construction are located in the CDRMS permit and are entitled Waste

Bank Design Summary Report, November 1993, revised December 1997, by Don R. May, P.E. Standard Proctor tests and nuclear density tests are being performed as detailed in Mr. May's aforementioned report to ensure that the waste pile continues to meet the designed compaction requirements. Should different types of strata be encountered during mining at the King II Mine, these tests will be repeated to ensure that no significant changes in compaction are allowed.

### **5.5.10 784.20 Subsidence Control Plan**

#### **Inventory of Structures and Renewable Resource Lands**

The Ute Mountain Tribe has not allowed access to the surface area above the proposed mining areas to allow an on-the-ground inventory of any structures or renewable resource lands within the proposed permit area. From aerial photography, the only structures and renewable resource lands observable are, barbed wire stock fences, stock ponds, and a two-track road system along the ridges within the permit area.

Aside from the above-mentioned structures, there are no structures or renewable resources in the permitted or potentially affected adjacent lands. There are no aquifers, recharge areas for aquifers, silviculture, or irrigated pasture land.

#### **WORST POSSIBLE CONSEQUENCES OF SUBSIDENCE**

The two track road system is the main structure on permitted or adjacent lands which could suffer damage due to the effects of subsidence. In the event that a surface subsidence crack were to intersect the road, it is possible that some repair of the road would be required to allow its continued use. This road is used primarily by the Ute Mountain Tribe for access to rangelands, hunting, and firewood cutting in the permit area.

In the event that subsidence cracks damage any barbed wire fence within the permit area (a fencepost could be dislodged or strands of barbed wire could stretch and break or sag), GCC Energy, LLC will repair said fences without charge to the Ute Mountain Tribe, or will reimburse the Tribe reasonable costs for any necessary repairs.

#### **SUBSIDENCE MONITORING PROGRAM**

Due to the lack of significant renewable resources or structures above areas where coal is to be extracted, GCC Energy, LLC does not anticipate the need for a specific subsidence monitoring plan.

### **5.5.11 784.21 Fish and Wildlife Information**

**Game Species** - Game species that could potentially utilize project area habitats include elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*), black bear (*Ursus americanus*), mountain lion (*Puma concolor*), and wild turkey (*Meleagris gallopavo*).

The project area includes a resident elk population, as well as mapped winter range for elk (CPW 2016). A resident population refers to a group of animals that use the area all year. Winter range refers to the location of 90 percent of individuals for an average of five winters out of ten. The project area contains mule deer summer and winter range, and a portion of CR 120 is within a mapped winter concentration area for mule deer (CPW 2016). No severe winter range or winter concentration areas for elk or mule deer have been identified in the existing lease area or the lease modification area. According to CPW, there are important migration corridors for mule deer and elk to the north and south of CR 120. Mule deer and elk use woodland areas for cover and can use a wide variety of other habitat types for browse.

Black bears are common and often sighted in the project area. According to CPW data, a portion of the project area is within black bear fall and summer concentration habitats (CPW 2016). Black bears and black bear sign were observed during field surveys in 2014 (BLM 2015).

The project area is within mapped overall mountain lion range (CPW 2016) and mountain lions have been observed in the proposed project area (BLM 2015).

Wild turkey overall range is mapped throughout the project area (CPW 2016). Wild turkey winter range, winter concentration, and production areas are mapped in portions of the project area. Several turkeys were observed during field surveys completed in 2014 (BLM 2015).

**Raptors** - The project area contains bald eagle (*Haliaeetus leucocephalus*) winter range, as mapped by CPW (CPW 2016). There are three active bald eagle nests and several undetermined, unknown, destroyed, or inactive nests within 12 miles of the proposed project area (CPW 2016). Within 10 miles of the project area, CPW has also mapped bald eagle winter foraging, summer foraging, and winter concentration areas. Potential Peregrine falcon (*Falco peregrinus*) nesting areas are located within five miles of the project area (CPW 2016). No bald eagles or peregrine falcons were observed in the proposed project area during 2014 surveys; however, several other raptors were observed including red-tailed hawk, northern harrier (*Circus cyaneus*), and American kestrel (*Falco sparverius*) nests (BLM 2015).

**Wild horses** – There are no known wild horse herds in the project area or vicinity.

**Migratory Birds** - Under the Migratory Bird Treaty Act (MBTA) (16 USC §703-712) and Executive Order 13186, “Responsibilities of Federal Agencies to Protect Migratory Birds,” federal agencies

are directed to consider land management and planning impacts to migratory birds. The USFWS administers the MBTA, which prohibits the take of any active nest. While all migratory birds are protected by the MBTA, certain species have been determined to be at greater risk than others. Bird species that are at greater conservation risk were considered per the USFWS Birds of Conservation Concern (BCC) 2008 report (USFWS 2008) and the Land Bird Conservation Plan created by the Colorado Partners in Flight (COPIF) (COPIF 2000), listed in Table 5-3. Potential effects focus on bird species that have habitat in the project area and vicinity and are included on the BCC list and/or the COPIF Land Bird Conservation Plan.

**Table 5-11. 784.21(a)(2)(i) USFWS Birds of Conservation Concern – Region 16 (Southern Rockies/Colorado Plateau) and Colorado Partners in Flight Priority Species – Physiographic Area 87 (Colorado Plateau)**

Species	Status <sup>1</sup>	General Habitat Description	Potential to Occur in or near the Project Area
American bittern ( <i>Botaurus lentiginosus</i> )	BCC	Marsh, swamp, or bog	No
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	BCC	Nests in tall trees and near bodies of water	Potential foraging
Band-tailed pigeon ( <i>Patagioenas fasciata</i> )	COPIF	Mature ponderosa pine and piñon pine	Potential breeding
Bendire's thrasher ( <i>Toxostoma bendirei</i> )	BCC	Open desert habitats including grasslands, shrublands, or woodlands with scattered shrubs or trees; sagebrush with scattered junipers	Potential breeding
Black rosy-finch ( <i>Leucosticte atrata</i> )	BCC	Rock faces in alpine tundra	No
Black-chinned hummingbird ( <i>Archilochus alexandri</i> )	COPIF	open pinyon-juniper woodland, lowland riparian woodland, and tall riparian shrublands, including Gambel oak	Potential breeding
Black-throated gray warbler ( <i>Dendroica nigrescens</i> )	COPIF	Piñon-juniper obligates, preferring tall, dense piñon-juniper woodlands; occasionally use adjacent ponderosa pine and Douglas-fir habitats	Potential breeding
Brewer's sparrow ( <i>Spizella breweri</i> )	COPIF, BCC	Primarily sagebrush, mixed shrublands	Potential breeding

Species	Status <sup>1</sup>	General Habitat Description	Potential to Occur in or near the Project Area
Brown-capped rosy-finch ( <i>Leucosticte australis</i> )	COPIF, BCC	Rock faces in alpine tundra	No
Burrowing owl ( <i>Athene cunicularia</i> )	BCC	Prairie dog colonies - grasslands, shrublands, and deserts	No
Cassin's kingbird ( <i>Tyrannus vociferans</i> )	COPIF	Piñon-juniper woodlands, frequently in association with sagebrush and rimrock	Potential breeding
Cassin's finch ( <i>Carpodacus cassinii</i> )	BCC	Mid-elevational forest, between 8,000 and 11,000 feet	Potential foraging
Chestnut-collared longspur ( <i>Calcarius ornatus</i> )	BCC	short and mixed-grass prairies with rolling topography	No
Common Poorwill ( <i>Phalaenoptilus nuttallii</i> )	COPIF	Rocky sagebrush and mountain shrublands, piñon-juniper woodlands, and ponderosa pine woodlands	Potential breeding
Ferruginous hawk ( <i>Buteo regalis</i> )	BCC	Grasslands and semi-desert shrub; winter resident in western Colorado	Winter only
Flammulated owl ( <i>Otus flammeolus</i> )	COPIF, BCC	Open ponderosa pine forests; dry montane conifer or aspen forests	Potential breeding
Golden eagle ( <i>Aquila chrysaetos</i> )	BCC	Open habitats including grasslands, sagebrush, farmlands or tundra	Potential foraging
Grace's warbler ( <i>Dendroica graciae</i> )	COPIF, BCC	Ponderosa pine with scrub oak understory	Potential breeding
Grasshopper Sparrow ( <i>Ammodramus savannarum</i> )	BCC	Open grassy and weedy meadows, pastures, and plains	Migrant only
Gray flycatcher ( <i>Empidonax wrightii</i> )	COPIF	Piñon-juniper obligate	Potential breeding
Gray vireo ( <i>Vireo vicinior</i> )	COPIF, BCC	Mesas, steep hillsides, canyons and wide valleys below 6,400 feet	No
Gunnison sage grouse ( <i>Centrocercus minimus</i> )	COPIF, BCC	Sagebrush grasslands	No

Species	Status <sup>1</sup>	General Habitat Description	Potential to Occur in or near the Project Area
Horned lark ( <i>Eremophila alpestris</i> )	COPIF	Prefer treeless areas with short grass, forbs, and/or scattered short shrubs.	Migrant only
Juniper titmouse ( <i>Baeolophus ridgwayi</i> )	COPIF, BCC	Piñon-juniper; cavity nester	Potential breeding
Lewis's woodpecker ( <i>Melanerpes lewis</i> )	COPIF, BCC	Open ponderosa pine forests, riparian, and piñon-juniper woodlands	Potential breeding
Loggerhead shrike ( <i>Lanius ludovicianus</i> )	COPIF	Utilize shrubby habitats in open country; tall desert shrubs or piñon-juniper edge habitats	Potential breeding
Long-billed curlew ( <i>Numenius americanus</i> )	BCC	No potential for occurrence; analysis area does not contain suitable habitat.	No
Mexican spotted owl ( <i>Strix occidentalis lucida</i> )	COPIF	Mature to old growth mixed conifer stands on steep, north-facing slopes	Potential breeding; however, project area surveys in 2014 and 2015 resulted in no detections (Ecosphere 2016a)
Mountain plover ( <i>Charadrius montanus</i> )	BCC	Grazed shortgrass prairie and fallow plowed agricultural fields.	No
Northern harrier ( <i>Circus cyaneus</i> )	COPIF	Prefer large tracts of wetlands with dense vegetation; also utilize wet meadows, grasslands, sagebrush, and mountain shrublands	Potential breeding
Northern sage grouse ( <i>Centrocercus urophasianus</i> )	COPIF	Sagebrush obligates, prefer large expanses of big sagebrush flat/rolling terrain, riparian meadows for brood and summer habitat	No

Species	Status <sup>1</sup>	General Habitat Description	Potential to Occur in or near the Project Area
Peregrine falcon ( <i>Falco peregrinus</i> )	COPIF, BCC	Cliffs, associated with riparian areas	Potential foraging
Piñon jay ( <i>Gymnorhinus cyanocephalus</i> )	COPIF, BCC	Piñon-juniper woodlands	Potential breeding
Prairie falcon ( <i>Falco mexicanus</i> )	BCC	Cliff faces in open country	Potential foraging
Sage sparrow ( <i>Amphispiza belli</i> )	COPIF	Large, low elevation stands of big sagebrush or mixed big sagebrush and greasewood	No
Scott's oriole ( <i>Icterus parisorum</i> )	COPIF	Low elevation piñon-juniper woodlands and juniper savannas	No
Short-eared owl ( <i>Asio flammeus</i> )	COPIF	Open habitats including grasslands, marsh edges, shrub-steppe, and agricultural lands with tall grass cover	Potential foraging
Snowy plover ( <i>Charadrius nivosus</i> )	BCC	Coastal beaches and shores of inland alkaline lakes with little to no vegetation.	No
Veery ( <i>Catharus fuscescens</i> )	BCC	Dense riparian thickets, willow-riparian.	No
Virginia's warbler ( <i>Vermivora virginiae</i> )	COPIF	Dense shrublands, piñon-juniper and oak woodlands	Potential breeding
Western bluebird ( <i>Sialia mexicana</i> )	COPIF	open ponderosa pine forests with large trees and snags with nest cavities	Potential breeding
Western kingbird ( <i>Tyrannus tyrannus</i> )	COPIF	Open riparian forests, agricultural areas, and piñon-juniper woodlands	Potential breeding
White-throated swift ( <i>Aeronautes saxatalis</i> )	COPIF	Cliffs required for nesting; may forage over many different habitats within a few miles of the nest	Potential foraging
Willow flycatcher ( <i>Empidonax traillii</i> )	BCC	Dense, shrubby riparian vegetation	No
Yellow-billed cuckoo ( <i>Coccyzus americanus</i> )	BCC	Broadleaf riparian forests with a dense understory	No

<sup>1</sup>Status codes:

COPIF = Colorado Partners in Flight Priority Species (COPIF 2000)

BCC = Birds of Conservation Concern (USFWS 2008)

According to the USFWS Information for Planning and Conservation tool, there are seven federally listed species that that should be considered in the impact analysis for the proposed action (USFWS 2017, Appendix 10.6). Table X lists these species, their status, basic habitat descriptions, habitat suitability in the project area, and documented presence in the project area. OSMRE determined that the King II Mine plan “is likely to adversely affect the continued existence” of fish in the San Juan River Basin that are listed under the ESA. This determination was based on a proposed 34 acre-feet per year depletion from a San Juan River sub-basin. OSMRE received a confirmation letter from USFWS (Appendix 10.6) that describes their biological opinion that there would be no effects to endangered fish species for water depletions of less than 100 acre-feet.

**Table 5-12. 784.21(a)(2)(i) Federally-listed species considered**

Species	Status*	Habitat Description	Potential to Occur in the Project Area
Mammals			
New Mexico meadow jumping mouse ( <i>Zapus hudsonious luteus</i> )	E	Habitat specialist occurring in herbaceous wetlands especially dominated by sedges.	No suitable habitat was observed in the Project Area.
North American wolverine ( <i>Gulo gulo luscus</i> )	P, T	Occurs within alpine, boreal, and arctic habitats; in the southern portion of its range (including Colorado) occurs in high-elevation alpine environments.	No suitable habitat; Project Area does not contain high-elevation alpine environments.
Birds			
Mexican spotted owl ( <i>Strix occidentalis lucida</i> )	T	Nests in caves, cliffs, or trees in steep-walled canyons with distinct cliff bands and vegetated benches.	Suitable habitat located north of surface disturbance associated with the proposed action; surveys completed in 2014 and 2015 resulted in no detections. Suitable habitat is present but the species is not suspected to occur.
Southwestern willow flycatcher ( <i>Empidonax traillii extimus</i> )	E	Breeds in dense, shrubby riparian habitats, usually near surface water or saturated soil.	No suitable habitat; Project Area does not contain dense, shrubby riparian habitats.
Fish			

Species	Status*	Habitat Description	Potential to Occur in the Project Area
Colorado pikeminnow ( <i>Ptychocheilus lucius</i> )	E	Large rivers with strong currents, deep pools, and quiet backwaters; tributaries of the Colorado and San Juan Rivers.	No potential to occur in the Project Area; water depletion downstream < 100 feet.
Razorback sucker ( <i>Xyrauchen texanus</i> )	E	Medium to large rivers with silty to rocky substrates. Prefers strong currents and deep pools.	No potential to occur in the Project Area; water depletion downstream < 100 feet.
<b>Flowering Plants</b>			
Chapin Mesa milkvetch ( <i>Astragalus schmolliae</i> )	C	Piñon-juniper vegetation with Cliff House sandstone member of the Mesa Verde Group; locally common on Chapin Mesa in Montezuma County, Colorado.	No potential to occur in the project area; strictly endemic to Chapin Mesa in Mesa Verde National Park, montezuma County, Colorado (Heil et. al 2013).

\*Status Codes: E= Endangered, P= Proposed, T= Threatened, C=Candidate for listing

### Seasonal Use of Potentially Occurring Wildlife Species

Except for migratory birds and bats the wildlife species encountered during the site inspection or that potentially occurs on-site are expected to be year-round residents or users of the site. Carnivore and ungulate species are not restricted to this site and tend to have relatively large home ranges (up to several square miles). Most rodent and insectivore species can be expected to reside on-site throughout the year, though many may hibernate during the cold months. Avian species may be year-round, temporary migrants, or summer residents of the site. Year-round residents would include raptors, gallinaceous birds, doves, owls, and woodpeckers. Most passerines would use the site during the spring, summer, and fall for breeding, feeding or resting during migration. Amphibian and reptile species of the site are year-round residents.

**Project Effects to Wildlife** – No effects are expected to occur to wildlife habitat within the permit boundary from implementation of exploration drilling or continued underground mining associated with the lease modification since the only surface disturbance associated with this permit revision would be from exploration drilling at select locations within the permit boundary (Figure 9-2). Exploration drilling operations would be of short duration and disturbance areas would be less than 0.25 acre per site. All sites would be reclaimed with appropriate vegetation following completion of drilling as specified in Section 7.1.2 (Part 815.15). GCC understands that nesting birds protected under the Migratory Bird Treaty Act could potentially be affected during drilling operations; to protect nesting birds, all drilling actions will either be completed outside of the nesting season or appropriate nest clearance surveys will be conducted by experienced biologists prior to any disturbance.

Biological surveys completed on exploration drill site locations within the permit boundary and proposed lease modification area have not identified any sensitive wildlife species or their habitat (Ecosphere 2016a,b; SWCA 2014; BLM 2015). Habitat for the federally listed Mexican spotted owl (*Strix occidentalis lucida*) was identified outside of but adjacent to the permit and lease boundaries during surveys conducted in 2014 and 2015 by Ecosphere Environmental Services (Ecosphere 2016a). Owl presence/absence studies were completed over a two-year period in 2014 and 2015 by Ecosphere with no spotted owls identified (Ecosphere 2016a).

Review of Colorado Natural Heritage Program (CNHP) databases for special status species in the permit area identified only previous records from 1992 and 1993 for Townsends big-eared bat (*Corynorhinus townsendii pallescens*) (a species of concern for the BLM and Forest Service) and from 1979 for wolverine (*Gulo gulo*) (assumed extirpated from Colorado since 1979) (Menefee 2015); however, habitat for these species were not identified at any of the exploration drill site locations within the permit/lease boundaries (SWCA 2014, Ecosphere 2016b).

The proposed project modifications should not have any impacts on species listed under the Endangered Species Act provided that all activity within ½ mile of potential Mexican spotted owl habitat takes place outside of the breeding season (March 15 through August 31). In addition, surveys completed in 2014 and 2015 following the outline in the Mexican Spotted Owl Recovery Plan did not identify spotted owls in the area and a 'no effect' on the species may be inferred for the following 5 years (through 2020) for any activity in MSO habitat (Ecosphere 2016a; BLM 2015).

No records of active or inactive bald or golden eagle nests or prey areas have been identified within or adjacent to the permit area. No known occurrences were identified during review of the CNHP database (Menefee 2015) and biological studies completed in the permit area (Ecosphere 2016a,b; SWCA 2014; BLM 2015) have also not identified any active nests in the area.

**Threatened and Endangered Wildlife Species** - No suitable or critical habitat for federal listed threatened and endangered species has been identified within the permit boundary from previous biological investigations completed in the area (Ecosphere 2016a,b; BLM 2015; SWCA 2014).

Review of the US Fish and Wildlife Service's (USFWS) Information for Planning and Conservation (IPaC) database (USFWS 2017) identified 5 federally listed species with the potential to occur in the permit area; Mexican spotted owl (*Strix occidentalis lucida*), southwestern willow flycatcher (*Empidonax traillii extimus*), Chapin Mesa milkvetch (*Astragalus schmolliae*), New Mexico meadow jumping mouse (*Zapus hudsonius luteus*), and the wolverine (*Gulo gulo luscus*).

Two fish species, Colorado pikeminnow (*Ptychocheilus lucius*) and razorback sucker (*Xyrauchen texanus*), were identified as potentially being affected by any water depletions that could occur in the area (USFWS 2017). An approximately 34 acre-feet per year depletion of water from a San Juan River sub-basin is anticipated for continued coal mining under the proposed lease boundary modification. In 2015, the OSMRE initiated a formal Section 7 of the Endangered Species Act consultation request with the USFWS for actions associated with the proposed lease boundary modification (Caveny 2015); species included in this consultation included those currently identified on the IPaC list. The OSMRE determined that there would be “no effect” on the continued existence to any listed species, except for the Colorado pikeminnow and the razorback sucker, who had a determination of “likely to adversely affect” the continued existence of those species (Caveny 2015). The USFWS provided a biological opinion that there would be no effects to endangered fish species from water depletions of less than 100 acre-feet (USFWS 2015).

An approved raptor protection plan is on file with the CDRMS, although no disturbance or construction of structures requiring compliance with the plan is proposed or anticipated for the PAP permit area. No powerlines are present in the permit area, so there is no potential for raptor electrocution in this area.

## **5.5.12 784.22 Geologic Information**

### **5.5.12.1 784.22(a) General**

Regional and local stratigraphy are described in Section 784.14(a-i) in detail as to the hydrologic environment and its relation to probably hydrologic consequences, acid-or toxic-forming strata, reclamation, and subsidence. This information is repeated in Section 784.22(b) purely in a geology format only.

#### **(1) Probable hydrologic consequences**

Probable hydrologic consequences are addressed in section 784.14 with respect to aquifers and potential aquifers, and surface water. Geologic map and cross sections are included in that section. The basal Menefee and Point Lookout formations are aquifers, but below (and with potentiometric surfaces below) the target coal horizon in the upper Menefee. The target coal interval and overburden Cliff House Sandstone are dry in historic experience in King I and King II mines. The gulch alluvium groundwater is of poor quality and not used for domestic, stock or irrigation purposes. There is no surface water except an irrigation ditch importing water from the La Plata River, and one seep issuing from a perched lens of water at the base of the Cliff House. It is improbable that the mine should lead to significant hydrologic consequences and probable hydrologic consequences are negligible.

**(2) Determining all potentially acid- or toxic-forming strata down to and including the stratum immediately below the coal seam to be mined**

Waste rock from the King II Mine has not found to generate acidity, including to containment ponds; further sampling is underway to confirm this.

**(3) Determining whether reclamation as required by this chapter can be accomplished and whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area**

There is minimal potential to impact the hydrology either in quantity or quality and no need for reclamation of any aspect of hydrology can reasonably be foreseen based on current available data; however, proposed groundwater monitoring as described in Section 784.14 will confirm this.

**(4) Preparing the subsidence control plan under §784.20.**

Historical experience indicates that the Cliff House Sandstone is competent to support itself over mined out areas without subsidence. As such a subsidence control plan would consist of only minimal mitigation measures as identified in Section 784.20 in the unlikely event that subsidence is observed.

**5.5.12.2 784.22(b) Geologic Information**

Geology for the King II Mine is summarized below and outlined in detail in Section 784.14(a-i). Relevant maps are identified in Section 783.25 and are provided in Chapter 9.

**(1) Geology Description**

The following description is excerpted from a geological report prepared during exploration drilling in the area.

*The King Coal Mine (and the proposed King II Mine) lies at the northwest edge of the San Juan Basin, which covers approximately 26,000 square miles of northwestern New Mexico and southwestern Colorado. The sedimentary strata of the basin were deposited at the western margin of a vast epeirogenic sea occupying the central area of the North American continent during the late Cretaceous Epoch. Extensive deposition of coal forming materials occurred during a succession of regressive/transgressive migrations of the shoreline in northeast (seaward)/southwest (landward) direction. With each successive cycle the maximum transgressive cycle shifted to the northeast until the final disappearance of the sea. The ultimate result was a jagged wedge of non-marine sediments in the southwestern area of the basin, intermingling with marine strata to the northeast. With each transgressive cycle accumulated*

*the transitional strata of barrier beach, marginal shore swamps (coal bearing), paludal (coal bearing), and other lower coastal plain deposits.*

**Local Geology** - The local area is characterized by strata deposited by a retreat of a Cretaceous inland sea, with shoreline sands advancing and forming the Cliff House Sandstone, with swamps and marsh behind accumulating peat which became coals of the Menefee Formation. Repeated cycles of advances and retreats of that sea laid down several tongues. In the area of interest, sandstone and coal bearing shale form southerly to southwesterly dipping strata of late Cretaceous age which has been deeply eroded to the north. The surface is capped by thin colluvial soils. Drainages are relatively narrow gulches with generally silty alluvium with minor lenticular gravel, believed to be late Pleistocene.

The uppermost Cretaceous formation exposed locally is the Cliff House Formation, which is the uppermost local member of the Mesa Verde Group, named for the Anasazi cliff dwellings most famously found in Mesa Verde National Park to the west. It is of marine origin and is composed of irregular to lenticular ledges of hard, fine to medium grained, calcareous sandstone in softer argillaceous fine sandstone, mudstone and silty shale. The top of this formation has been removed by erosion, leaving an average thickness of 350 feet. The Cliff House Formation overlies the Menefee Formation.

The Menefee Formation, which is the middle member of the Mesa Verde Group, is composed of a complex assemblage of cross-bedded sandstones, black shales and coal beds. Up to seven coal seams have been identified by the U. S. Geological Survey. The Menefee Formation has an average local thickness of 300 feet. The Menefee overlies the Point Lookout Formation.

The Point Lookout Formation, which is the basal member of the Mesa Verde Group and was deposited by the transgressive shoreline, is divided into two parts. The upper member consists of thick, massive beds of even-textured, medium-grained sandstone. The lower member consists of thin sandstone beds lying on the Mancos Shale below. The Point Lookout Formation has an average local thickness of 400 feet.

The Mancos Shale, which is exposed approximately four miles north of the King Coal Mine, is of marine origin and composed of dark-gray to black shale and silty to fine sandy shale with small amounts of dark-gray argillaceous limestone in lenses. The Mancos Shale has an average local thickness of 2000 feet.

The Cretaceous strata dip 2-3° in a south/southwesterly direction, and to the southwest they disappear under the alluvium of the La Plata River.

**Surface Geology** - Only the upper two members of the Mesa Verde Group (Cliff House and coal-bearing Menefee) are exposed on the property. The proposed King II Mine is located on the north side of Hay Gulch with entries driven into the “A” seam of the Menefee Formation. The Cliff House Formation caps the higher ground on both sides of the gulch.

**Coal Geology** - Exploration drilling and analysis concluded that the two coal seams exposed at the King I coalesce into on “A” seam pod in the King II mine. At the location of the proposed King II Mine there is one “A” coal seam pod with a thickness ranging from 5.0 to 11.7 feet, with an average of 9.9 feet.

Bedding at the project site dips 4-6° in a south-southwesterly direction.

The Cliff House is a strong roof to the room and pillar mine. It has not be found and is not expected to collapse in a blocky manner when pillars are robbed in retreat mining. Some cracking has been observed in the roof and at surface over previous operations but this is very minor.

**Coal Quality** - The coal within the “A” seam pod of the proposed King II Mine is low ash, low sulfur, and bituminous coal with a 5.0 free swelling index (blending metallurgical coal). An average analysis of six samples as received follows:

**Table 5-13. 784.22(b)(1) Coal Quality at King II Mine**

BTU/lb	Moisture	Ash	Sulfur
12,743	5.6%	7.5%	0.68%

**Geologic Hazards** - Geologist David L. Gaskill of the Conservation Division of the U.S.G.S. reported no unusual geologic hazards are known that might adversely affect mining in the upper or lower Menefee coal seams. He noted that ground water tables were below the seams. Landon Beck report of January 31, 2016 corroborated this finding. Mr. Gaskill's report was prepared in February, 1980, for the survey's consideration of National King Coal's application for a new Federal Lease adjacent to the current lease holdings at the current mine. The monitoring wells as approved in CDRMS permit TR-26, will provide additional confirmation of water table levels in the area.

An inspection of the current King Coal Mine workings shows no significant faults or strata displacements, nor are any evident in a survey of Google Earth imagery from 2015. The coal is strong and pillars are structurally competent showing a lack of squeezing (crushing) and rib spalling. The mine floor does not buckle due to stress from the overburden and because the

water table is lower than the seams, pore water pressure is non-existent. The immediate mine roof consists of thinly laminated shales and sandstones. These beds rise up to the base of the Cliff House Sandstone an average of twenty feet above the coal seam. This thick sandstone provides a great deal of ground stability and generally prevents subsidence from reaching the surface when and after pillars are extracted during retreat mining.

**784.22(b)(2) Rock to be Exposed by Mining**

No portion of the permit area will have overburden/strata removed down to the coal seam to be mined. No rock will be exposed by mining except at the portal and surface facilities.

**784.22(b)(3) Overburden Analysis**

For lands within the permit and adjacent areas where the strata above the coal seam to be mined will not be removed, sampling and testing will be undertaken to provide the following data:

- (i) geometry of distinct strata that may be impacted, and presence of water
- (ii) acid/alkali generation potential
- (iii) analysis of sulfur content, unless waived by CDRMS
- (iv) engineering properties of immediate roof

Coring is being undertaken in drilling monitoring wells, and is currently underway. Core samples are being submitted for analysis of acid/alkali generation potential, sulfur content and speciation, and geotechnical properties pertinent to analysis of subsidence potential. This program is described in a sampling and analysis plan by RHS. An addendum to this permit revision will report these analyses.

There are two overlapping parts to the assessment based on this SAP, namely assessment of the waste rock generated by surface construction and mine roof waste, and geotechnical and geochemical core analysis of rock left in the mine regarding water quality and subsidence. Core sampling and the geochemical findings of unconsolidated waste rock piles will support the addendum addressing (b) (3).

- (i) Proximal strata (roof and floor) will be described by lithologic and geophysical (natural gamma, gamma-gamma density and neutron density) logs, presented as cross sections, with any presence of water noted and subjected to hydraulic testing should the quantity of water justify it.
- (ii) Acid/alkali potential will be assessed by the content of oxidizable sulfur (yielding acidity) and carbonate (acid neutralizing)

(iii) Sulfur content and speciation as sulfide, native sulfur, sulfate and organic sulfur will be analyzed

(v) Engineering properties of immediate roof materials will be tested as unconfined compressive strength and Brazilian tensile strength, for assessment of the potential for pillar punching and competence of the Cliff House Sandstone roof when pillars are robbed, both for mine safety and subsidence management.

**784.22 (c)** CDRMS may require additional information to protect the hydrologic balance and/or minimize subsidence

**784.22 (d)** CDRMS may waive in whole or in part (b) 2 and 3 if it is found that this information is not necessary because other information answering the purpose is available.

### **5.5.13 784.23 Operation Plan: Maps and Plans**

(a) The maps, plans and cross-sections that show the underground mining activities to be conducted, the lands to be affected throughout the operation are shown in Figures 9-1 through 9-5.

(b) Figures 9-1 through 9-5 show (if present in the mine plan) buildings, utility corridors, and facilities to be used; the area of land to be affected within the proposed permit area, according to the sequence of mining and reclamation; each area of land for which a performance bond or other equivalent guarantee will be posted under subchapter J of this chapter; each coal storage, cleaning and loading area; each topsoil, spoil, coal preparation waste, underground development waste, and non-coal waste storage area; each water diversion, collection, conveyance, treatment, storage and discharge facility to be used; each source of waste and each waste disposal facility relating to coal processing or pollution control; each facility to be used to protect and enhance fish and wildlife related environmental values; each explosive storage and handling facility; location of each sedimentation pond, permanent water impoundment, coal processing waste bank, and coal processing waste dam and embankment, in accordance with 30 CFR 784.16 and disposal areas for underground development waste and excess spoil, in accordance with 30 CFR 784.19;

There will be no surface facilities or features constructed by the mining operation within the PAP permit area.

There are less than 3 acres of land affected within the proposed permit area by development of exploration drill sites.

(c) Except as provided in §§784.16(a)(2), 784.16(a)(3), 784.19, 817.71(b), 817.73(c), 817.74(c) and 817.81(c) of this chapter, cross sections, maps and plans required under paragraphs (b)(4), (5), (6), (10) and (11) of this section have been prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, a professional geologist, or in any State which authorizes land surveyors to prepare and certify such cross sections, maps and plans, a qualified, registered, professional, land surveyor, with assistance from experts in related fields such as landscape architecture.

#### **5.5.14 784.24 Road Systems**

No roads, as defined in §701.5 of Subchapter G, Chapter VII, Title 30, will be constructed or maintained within the permit area or lease boundary. Existing ,primitive “two-track” roads may be used within the lease boundary to access exploration drill sites; however, no modifications to these roads is expected to be required.

#### **5.5.15 784.25 Return of Coal Processing Waste to Abandoned Underground Workings**

No coal mine waste will be returned to underground workings at the King II Mine.

#### **5.5.16 784.26 Air Pollution Control Plan**

An Air Pollution Control Permit has been obtained from the Colorado Department of Public Health and Environment. A copy of this permit is included in Appendix 10.2.

#### **5.5.17 784.29 Diversions**

No stream channel diversions or other diversions are proposed for construction within the permit or proposed lease modification area.

#### **5.5.18 784.30 Support Facilities**

No new support facilities are proposed for construction within the permit area or modified lease boundary area.

### **5.6 PART 785 - Requirements for Special Categories of Mining**

Parts 785.11-785.18 and Parts 785.20-785.25 do not apply to this mining operation.

**5.6.1 785.19 Surface coal mining and reclamation operations on areas or adjacent to areas including alluvial valley floors in the arid and semiarid areas west of the 100th meridian.**

Hay Gulch has been determined to be an alluvial floor by geologist Fred M. Johnson, the Colorado Geological Survey, and the CDRMS in findings related to the permitting of the King Coal Mine. The Hay Gulch alluvial valley floor is shown on Figure 9-11.

The operations of the King II Mine do not propose to affect the Hay Gulch alluvial valley floor. The only mining-related features in the alluvial valley floor are monitoring wells. At the end of mining, and with the approval of the CDRMS, those wells will be reclaimed in accordance with the requirements of Rule 4.07 or transferred to another party.

Measures have been taken, as described previously in the King Coal Mine permit, to protect the alluvial valley floor from adverse effects of mining. Currently, no surface water reaches Hay Gulch from the project area; it is either intercepted by the Hay Gulch irrigation ditch or the elevated base of County Road 120. Mining operations will continue to ensure water from up-slope areas are diverted around all disturbed areas to the Hay Gulch drainage or contained within the disturbed areas. Water monitoring will insure that protection of the alluvial valley floor is maintained.

The mining operations within the proposed PAP permit area are further removed from Hay Gulch by the intervening property described above. The potential for any adverse effects to the AVF from mining within the PAP permit area are negligible to non-existent.

## **6. Title 30—Mineral Resources, Chapter VII—Office of Surface Mining Reclamation and Enforcement, Department of the Interior, Subchapter J – Bonding and Insurance Requirements for Surface Coal Mining and Reclamation Operations**

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### **6.1 Part 800 — Bond and Insurance Requirements for Surface Coal Mining and Reclamation Operations Under Regulatory Programs (§§ 800.1 - 800.70)**

#### **6.1.1 800.11 — Requirement to file a bond**

##### **6.1.1.1 800.11(b)(1-4)**

GCC Energy, LLC (GCC) will provide an additional bond amount, as determined by the Office of Surface Mining Reclamation and Enforcement (OSMRE), to cover exploration work on the identified additional increments of land located within the current permit area, as shown on Figure 9-1. Prior bond amounts totaled \$10,200. A copy of the collateral bond document for the current \$10,200 bond is included for reference. The action to include an updated bond consists of exploration work comprising placement of 13 boreholes and use of approximately 0.812 mile of temporary cross-country travel routes within the existing permit boundary. GCC has identified an initial estimate of the total bond amount of \$32,555.75, including the \$10,200 previously provided for the drill sites and access routes. A draft calculation of the expected updated bond amount for reclamation of the borehole locations and temporary cross-country travel routes is provided in Appendix 10.13.

##### **6.1.1.2 800.11(d)**

With the approval of OSMRE, GCC will file a revised collateral bond to cover the additional amount needed for reclamation of the drill sites and access routes in the permit area, as determined in accordance with § 800.14.

#### **6.1.2 800.12 — Form of the performance bond**

GCC will adopt the updated bond as prescribed by OSMRE; this updated bond is expected to be a collateral bond reflecting the added amount needed to cover the estimated bond amount described in Section 800.11 and Appendix 10.13. GCC will provide OSMRE with a copy of the modified collateral bond form as specified by OSMRE; an example of the form to be provided (the current bonding form) is provided with this application.

### **6.1.3 800.13 — Period of liability**

#### **6.1.3.1 800.13(a)(1)**

The performance bond liability will be for the duration of the action and until successful reclamation is reached, as described in Part 815.15.

#### **6.1.3.2 800.13(d)(1)**

The updated bond liability will cover actions that GCC is obligated to take under the existing permit, including completion of reclamation, so that the land will be capable of supporting the post-exploration land use of rangeland and wildlife habitat.

### **6.1.4 800.14 — Determination of bond amount**

#### **6.1.4.1 800.14(a) (1-4)**

GCC understands that the amount of the updated bond required for the exploration actions will ultimately be determined by OSMRE, the requirements of the approved permit, and reclamation plan; reflect the probable difficulty of reclamation; consider such factors as topography, geology, hydrology, and revegetation potential; and be based on, but not limited to, the estimated cost submitted by GCC in Appendix 10.13.

### **6.1.5 800.15 — Adjustment of amount**

#### **6.1.5.1 800.15(a -b)**

If the proposed bond amount reflected in Appendix 10.13 requires modification as directed by OSMRE, GCC will be notified of any proposed adjustment to the updated bond amount and will be provided an opportunity for an informal conference on the adjustment.

### **6.1.6 800.16 — General terms and conditions of bond**

#### **6.1.6.1 800.16(a-e)**

GCC will provide a performance bond in an amount determined by OSMRE, as provided in §§ 800.14 and 800.15; it is assumed that the required updated bond amount will resemble the amount provided in Appendix 10.13. The updated performance bond will be payable to OSMRE and will be conditioned upon completion of reclamation requirements as outlined in Part 815.15. The duration of the updated bond will be for the time period as described in § 800.13.

The updated bond will include a mechanism for the surety company to give prompt notice to OSMRE and GCC of any action filed alleging the insolvency or bankruptcy of the surety company or alleging any violations that could result in suspension or revocation of the surety or bank charter or license to do business.

### **6.1.7 800.17 — Bonding requirements for underground coal mines and long-term coal-related surface facilities and structures**

#### **6.1.7.1 800.17(a) Responsibilities**

GCC will provide bond coverage, as directed by OSMRE, in an amount as described under § 800.14, for areas disturbed by surface impacts incidental to exploration work associated with the King II Mine. The estimated updated bond amount is described in Appendix 10.13.

#### **6.1.7.2 800.17(b) Long-term period of liability**

(1) The period of liability for the updated bond will extend until all reclamation and restoration work under the permit has been completed and the bond is released under the provisions of § 800.40.

(4) Continuous bond coverage will be carried throughout the period of extended responsibility for successful revegetation and until the provisions of § 800.40 have been met.

### **6.1.8 800.21 — Collateral bonds**

(a) GCC will provide OSMRE with a certificate of deposit for the additional bond amount made payable to OSMRE. OSMRE will keep custody of the additional collateral until it is authorized for release or replacement.

### **6.1.9 800.40 — Requirement to release performance bonds**

#### **(a) Bond release application.**

(1) GCC will file an application with OSMRE for the release of all or part of the performance bond once reclamation work has been completed and during the spring, summer, or fall when the reclamation work can be properly inspected by OSMRE.

(2) Within 30 days after an application for bond release has been filed with OSMRE, GCC will submit a copy of an advertisement placed at least once a week for four successive weeks in the Durango Herald newspaper. The advertisement will contain the GCC's name, the permit number and approval date, notification of the precise location of the land affected, the number of acres, the type and amount of the bond filed and the portion sought to be released, a description of the results achieved, and the name and address of the OSMRE office to which written comments, objections, or requests for public hearings and informal conferences on the specific bond release may be submitted pursuant to § 800.40 (f) and (h). In addition, as part of any bond release application, GCC will submit copies of letters sent to adjoining property owners, local governmental bodies, and planning agencies, notifying them of the intention to seek release from the bond.

(3) GCC will include in the application for bond release a notarized statement certifying that all applicable reclamation activities have been accomplished in accordance with the specified requirements, regulatory program, and approved reclamation plan. Such certification will be submitted for each application or phase of bond release.

**6.1.10 800.60 — Terms and conditions for liability insurance**

(a) GCC has included with this permit revision a certificate issued by an insurance company authorized to do business in the United States certifying that GCC has a public liability insurance policy in force for the operations for which the permit revision is sought. This policy provides for personal injury and property damage protection in the amount of \$25,000,000 for each occurrence and \$25,000,000 aggregate.

(b) The policy will be maintained in full force during the life of the permit or any renewal thereof and the liability period necessary to complete all reclamation operations.

(c) The policy includes a rider stating that the insurer will notify OSMRE whenever substantive changes are made in the policy, including any termination or failure to renew.

(h) All facilities and equipment will be promptly removed from the exploration area when they are no longer needed for exploration, except for those facilities and equipment that may need to remain to provide additional environmental data, reduce or control any on-site and off-site effects of the exploration activities, or facilitate future reclamation operations.

(i) Coal exploration will be conducted in a manner that minimizes disturbance of the prevailing hydrologic balance in accordance with CFR Title 30, Chapter VII, Subchapter K, Part 816, Sections 816.41 through 816.49.

(j) Acid- or toxic-forming materials will be handled and disposed of in accordance with §§ 816.41(b), 816.41(f), and 816.102(e).

**Table 6-1. 800.60 Updated Estimated Bond Calculations for Incremental Project Changes**

Description of Reclamation Work	Units	Unit Cost	Job Cost
<b>DOWN-HOLE RECLAMATION - Seal 13 boreholes (labor and materials):</b>			
Plugs, casing, and marker (material only)	Steel and Cement Plugs	Not Applicable	\$7,976.00
Drill rig and water truck (includes labor)	52	\$251.00	\$13,052.00
Down-Hole Reclamation Subtotal:			\$21,028.00

Description of Reclamation Work	Units	Unit Cost	Job Cost
Note: Two steel plugs and 27 feet of cement per borehole; 4 hours labor per borehole.			
<b>SURFACE RECLAMATION - Prepare seed bed and re-seed 13 borehole sites and 0.812 mile of temporary cross-country travel routes:</b>			
Prepare seed beds on drill pads and pits	10.3	\$90.00	\$927.00
Replace topsoil on travel routes	4.3	\$90.00	\$387.00
Prepare seed bed on temporary cross-country travel routes	1.14	\$90.00	\$102.60
Re-seed drill pads (includes seed and straw)	80.4	\$36.00	\$2,894.40
Re-seed temporary cross-country travel routes (includes seed and straw)	19.6	\$36.00	\$705.60
Surface Reclamation Subtotal:			\$5,016.60
<b>Subtotal Direct Costs:</b>			<b>\$26,044.60</b>
Indirect Burden = 25% of Direct Costs:			\$6,511.15
<b>Total Estimated Bond Amount (Direct + Indirect):</b>			<b>\$32,555.75</b>

Note: Drill pad size averages 0.23 acre. Re-seeding for 0.812 mile of reclaimed temporary cross-country travel routes is equivalent to 1.3 borehole pads. Selective re-seeding on approximately 25 percent of disturbed acres.

## **7. Title 30—Mineral Resources, Chapter VII—Office of Surface Mining Reclamation and Enforcement, Department of the Interior, Subchapter K — Permanent Program Performance Standards**

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Parts 810, 816, 819 to 820, and 823 to 828 do not apply to this permit application.

### **7.1 Part 815 — Permanent Program Performance Standards – Coal Exploration (§§ 815.1 - 815.15)**

#### **7.1.1 815.13 — Required documents**

Each person who conducts coal exploration that substantially disturbs the natural land surface would, while in the exploration area, have available a copy of the filed notice of intention to explore or a copy of the exploration permit for review by the authorized representative of the regulatory authority upon request.

#### **7.1.2 815.15 — Performance standards for coal exploration**

GCC will comply with the following applicable performance standards for release of the bond amount identified in Section 800.11.

**(a)** Habitats of unique or unusually high value for fish, wildlife, and other related environmental values and critical habitats of threatened or endangered species identified pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) will not be disturbed. Biological surveys completed in the permit area have not identified any sensitive species or habitat that may be disturbed.

**(b)** Use of roads used for coal exploration will comply with the applicable provisions of CFR Title 30, Chapter VII, Subchapter K, Part 816, Section 816.150 - Roads: General, Parts (b) through (f).

**(c)** If excavations, artificially flat areas, or embankments are created during exploration, these areas will be returned to the approximate original contour promptly after such features are no longer needed for coal exploration.

**(d)** Topsoil will be separately removed, stored, and redistributed on areas disturbed by coal exploration activities as necessary to assure successful revegetation or as required by OSMRE.

**(e)** All areas disturbed by coal exploration activities will be revegetated in a manner that encourages prompt revegetation and recovery of a diverse, effective, and permanent vegetative cover. Revegetation will be accomplished in accordance with the following:

(1) All areas disturbed by coal exploration activities will be seeded or planted using the seed mix approved in the permit.

(2) The vegetative cover can stabilize the soil surface from erosion.

(f) Diversions of overland flows and ephemeral, perennial, or intermittent streams will be made in accordance with CFR Title 30, Chapter VII, Subchapter K, Part 816, Section 816.43(c) - Diversion of Miscellaneous Flows. No perennial or intermittent drainages have been identified within the permit area.

(g) Each exploration hole, borehole, well, or other exposed underground opening created during exploration will be reclaimed in accordance with CFR Title 30, Chapter VII, Subchapter K, Part 816, Sections 816.13 through 816.15 – Casing and Sealing of Drilled Holes.

## **7.2 Part 816 — Permanent Program Performance Standards—Surface Mining Activities**

### **7.2.1 816.13 — Casing and sealing of drilled holes: General requirements**

Each exploration hole, other drill or borehole, well, or other exposed underground opening will be cased, sealed, or otherwise managed, as approved by OSMRE, to prevent any potentially toxic drainage from entering ground or surface waters, to minimize disturbance to the prevailing hydrologic balance, and to ensure the safety of people, livestock, fish and wildlife, and machinery in the permit area and adjacent area. If these openings are uncovered or exposed by surface mining activities within the permit area they will be permanently closed, unless approved for water monitoring, or otherwise managed in a manner approved by the OSMRE.

### **7.2.2 816.14 — Casing and sealing of drilled holes: Temporary**

Each exploration hole, other drill or boreholes, wells and other exposed underground openings that have been identified in the approved permit application for use to return coal processing waste or water to underground workings, or to be used to monitor ground water conditions, would be temporarily sealed before use and protected during use by barricades, or fences, or other protective devices approved by the regulatory authority. These devices would be periodically inspected and maintained in good operating condition by the person who conducts the surface mining activities.

### **7.2.3 816.15 — Casing and sealing of drilled holes: Permanent**

When no longer needed for monitoring or other use approved by the regulatory authority upon a finding of no adverse environmental or health and safety effect, or unless approved for transfer as a water well under §816.41, each exploration hole, other drilled hole or borehole,

well, and other exposed underground opening would be capped, sealed, backfilled, or otherwise properly managed, as required by the regulatory authority, under §816.13 and consistent with 30 CFR 75.1711. Permanent closure measures would be designed to prevent access to the mine workings by people, livestock, fish and wildlife, and machinery, and to keep acid or other toxic drainage from entering ground or surface waters

### **7.3 Part 817 — Permanent Program Performance Standards – Underground Mining Activities**

#### **7.3.1 817.13 — Casing and sealing of exposed underground openings: General requirements**

Each exploration hole, other drillhole or borehole, shaft, well, or other exposed underground opening will be cased, lined, or otherwise managed as approved by OSMRE to prevent acid or other toxic drainage from entering ground and surface waters, to minimize disturbance to the prevailing hydrologic balance and to ensure the safety of people, livestock, fish and wildlife, and machinery in the permit area and adjacent area. Each exploration hole, drill hole or borehole or well that is uncovered or exposed by mining activities within the permit area will be permanently closed, unless approved for water monitoring or otherwise managed in a manner approved by OSMRE. Use of a drilled hole or monitoring well as a water well will meet the provisions of §817.41 of this application. This section does not apply to holes drilled and used for blasting, in the area affected by surface operations.

#### **7.3.2 817.14 — Casing and sealing of underground openings: Temporary**

No mine entry has or will be identified as temporarily inactive at the King II Mine. No exploration hole, other drill hole or borehole, shaft, well, and other exposed underground opening has been identified in the approved permit application for use to return underground development waste, coal processing waste or water to underground workings, or to be used to monitor ground water conditions.

#### **7.3.3 817.15 — Casing and sealing of underground openings: Permanent.**

When no longer needed for monitoring or other use approved by the regulatory authority upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under §817.41, each shaft, drift, adit, tunnel, exploratory hole, entryway or other opening to the surface from underground would be capped, sealed, backfilled, or otherwise properly managed, as required by the regulatory authority in accordance with §817.13 and consistent with 30 CFR 75.1711. Permanent closure measures would be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

**Sealing Mine Openings** - In accordance with the requirements of our mine plan, 211.41 (c) 30 CFR, the portals (mine openings or entrances into the King I Mine) will be backfilled and sealed against inflows of surface water and access by animals or people. Coal stockpile residue on the permit area will be scraped from the surface and used for backfill inside the portals. This will limit the presence of any potential acid-forming or toxic materials in backfilled and re-graded area and minimize potential contamination of topsoil and revegetation. The four portals are each approximately 10 feet wide by 8 feet high. To fill them to a depth of 25 feet will require about 296 cubic yards of material plus a small amount to account for sloughing at the inby end. Total portal backfill will require approximately 400 cubic yards of material. After back-filling to a depth of 25 feet from the portal, the mouth of the portals will be caved to completely seal them. The area will then be backfilled, graded and smoothed over to closely approximate the original contour of the hill into which the portals have been opened.

**Sealing Exploration Drill Holes** - Any coal exploration drill holes, vent holes, and groundwater monitoring wells (not transferred to the landowner) in the permit area will be backfilled, sealed at water bearing zones, and capped with concrete plugs to meet reclamation requirements. Drill holes will be sealed by filling with cement to an elevation above the coal seam encounter and any water-bearing intervals encountered, then replacing cuttings or other suitable media in the hole and placing a suitable plug 10 feet below the ground surface for support of a cement plug to within 3 feet of the ground surface. The plug will be covered with like material as in road base or topsoil depending which is present. Tracks will be raked or brushed to remove obvious signs of activity.

#### **7.3.4 817.22 (a-e) — Topsoil and subsoil.**

(a-c) Sufficient suitable topsoil resources exist in the Umbarg soil map unit to provide topsoil replacement depths of six inches. This replacement depth will require stockpiling and ultimate replacement of 20,570 cubic yards of topsoil from the A and B horizons of the Umbarg series. Topsoil will be salvaged and stockpiled using truck/shovel or scraper methods. Topsoil will be salvaged and stockpiled during the operation in piles constructed adjacent to the sediment pond and north of Coal Stack Tube #2. The topsoil pile will be stabilized using the seed mix proposed for final reclamation. To further minimize the potential for accidental contamination, a berm will be constructed around the perimeter of the toe of the topsoil piles. The berms will be of sufficient size to prevent machinery from intruding on the topsoil stockpile.

**Exploration Core Drilling** - Topsoil will be salvaged and replaced at all areas of new disturbance caused by exploration core drilling that may damage existing topsoil, such as “cuttings pits”, used to collect drill cuttings. Existing topsoil will be removed from these areas and stockpiled in a nearby area where it can be accessed without causing damage to the stockpile location. The

topsoil stockpile will be “bermed”, tarped, or otherwise protected to help prevent loss of topsoil due to rain and wind events. Once the cuttings pits have been re-filled with sub-soil material, the topsoil will be returned to its original location, spread evenly, and re-seeded.

(d) Topsoil will be redistributed to a finished depth of six (6) inches over all disturbed areas to be reclaimed. Topsoil replacement operations will be completed after backfill and grading operations. To ensure good contact between replaced topsoil and re-graded material, the surface of re-graded areas will be left in a roughened condition. Topsoil will be replaced using methods to minimize compaction after placement. In areas where compaction occurs, ripping or tilling of the replaced topsoil will take place.

(e) Subsoil (B horizon) is removed, stockpiled, and redistributed with the topsoil (A horizon) at the King II Mine site.

### **7.3.5 817.41(a-j) — Hydrologic-balance Protection**

(a) Underground mining, surface facilities and reclamation have minimal potential for impacts to the pre-mining hydrologic balance and water quality.

(b) It has been the historic experience at King I and King II and other mines in the area that the mines are dry, with little or no inflow of groundwater, because overlying strata are unsaturated and the base of the coal bearing formation (Menefee) is an aquitard. Water use in both King I and King II mines has been restricted to dust control, and there is no water discharge from the mine other than moisture on mined coal and vapor in ventilation air. The very small quantity of water that seeps from occasional perched lenses is also evaporated by ventilation.

(c) Groundwater monitoring to date has been limited to alluvial wells because the mined coal and bedrock above it is known to be unsaturated. However, four clusters of bedrock wells are currently being installed to confirm this condition, or to allow gathering potentiometric and water quality data should they yield water. When four quarters of monitoring data are acquired an addendum to this permit application would be prepared to report the findings. There has been extended monitoring of alluvial groundwater in Hay Gulch. This water is not generally used for domestic purposes because it has high total dissolved salts and often sulfate. Analytical data from domestic wells near the permit area have been presented earlier. These wells are typically open from lower coal seams through underlying sandstones and are not susceptible to impacts of mining. Monitoring of alluvial and bedrock wells will continue through mining into reclamation. The regulatory authority may modify the monitoring requirements (abbreviating the analyte list and/or the frequency of sampling) if the operator demonstrates, using the monitoring data, that there has been minimal disturbance to the hydrologic balance or water

quality and that monitoring is no longer necessary to achieve the purposes of the monitoring plan.

(d) Surface water quality will be protected by materials handling and runoff management to minimize additional contribution of sediment to streamflow. Runoff from surface facility areas will be directed by berms, ditch and culverts to an unlined sediment pond with vertical spillways fitted with oil skimmers. Water captured in the runoff control pond will be allowed to evaporate and infiltrate to alluvium. Grease, lubricants, paints, fuel and flammable liquids, and any toxic or corrosive substances, are stored in the Fuel Storage Building with proper containment, and wastes are collected on a regular basis by a certified hazardous material collection company such as Safety Kleen.

(e) There is no surface water in the permit area other than the Hay Ditch, and occasional thaw or summer storm runoff. The Hay Ditch imports irrigation water from outside the catchment, and is sampled as part of the monitoring plan at points above and below the mine. This sampling may be terminated when mining is finished if the operator demonstrates there has been no disturbance to water quality or flow in the ditch by mining.

(f) At no time would any non-coal mine waste be deposited in a refuse pile or impounding structure, nor would any pit for non-coal mine waste disposal be located within 8 feet of any coal outcrop or coal storage area. No waste rock or coal fines will be left underground or at surface. All coal will be removed, and any residual coal fines not mixed in with product will be buried at least four feet under fill and topsoil. Any waste rock will be kept in a refuse pile to be hauled off-site.

(g) Before final release of bond, monitoring wells would be abandoned following best practices by a certified well driller.

(h) No discharges will be made to the mine, neither water, coal or ash wastes or sludges of any type, or waste rock. Salvageable steel and concrete will be moved to a salvage yard or regulated landfill. Some inert materials such as steel and concrete bulkheads and supporting structures may be left in the mine subject to the approval of CDRMS.

(i) There will be no gravity discharges to or from the mine. The mine is and is expected to remain dry, with no inflow to generate a discharge, and the portal will be sealed to prevent entry of precipitation and runoff.

(j) If any drinking, domestic or residential water supply existing prior to the issuance of the mining permit is contaminated, diminished or interrupted by mining impacts, the operator will

replace it. The baseline hydrology information in the permit will be used to determine the impact of mining activity.

### **7.3.6 817.42 — Hydrologic balance: Water quality standards and effluent limitations.**

This regulation specifies that discharges of water from areas disturbed by underground mining activities would be in compliance with applicable State and Federal water quality laws and regulations and EPA limitations in 40 CFR 434. It is expected that there will be no discharge of water from this mine, but should there be, such water will be treated as required to meet such rules. Such small amounts of water as might be expected will likely be evaporated, or if they occur in sufficient quantity to require containment, that they will be directed to dust control within the mine.

### **7.3.7 817.43 — Diversions**

Stormwater is collected in unlined ponds and allowed to evaporate and infiltrate to soil and alluvium. Should sediment accumulate in these ponds to significantly reduce pond capacity, it will be excavated and removed to an approved location.

### **7.3.8 817.45 — Hydrologic Balance: Sediment Control Measures**

The sediment control system for the King II Mine comprises undisturbed-area drainage ditches and one sediment pond. Designs for sediment control system structures are included in Appendix 10.11.

The drainage plan for the King II Mine has two diversion ditches for runoff from above the mine yard, and one sediment pond capturing runoff from the disturbed mine yard. Uncontaminated runoff diversion ditches will carry runoff through the yard to a discharge point at the south end of the site onto the meadow of Hay Gulch. Runoff from the mine yard will be diverted by berms, culverts, and V-ditches to the pond located at the southeast corner of the mine bench.

Approximately 1.3 acres of disturbed area, consisting of the haul road from the pond to County Road 120, lie below the sediment pond. Runoff from this area will tend to collect on the sides of the haul road. Alternate measures for control of this water and its sediment consist of rock check dams, rock filters and a gravel surface.

Topsoil will be salvaged and stockpiled during the operation in piles constructed adjacent to the sediment pond and north of Coal Stack Tube #2. The topsoil pile will be stabilized using the seed mix proposed for final reclamation. To further minimize the potential for accidental contamination, a berm will be constructed around the perimeter of the toe of the topsoil piles.

The berms will be of sufficient size to prevent machinery from intruding on the topsoil stockpile.

### **7.3.9 817.46 — Hydrologic balance: Siltation structures.**

To prevent contributions of suspended solids and sediment to streamflow or runoff outside the permit area, two undisturbed area drainage ditches will convey undisturbed surface flow around the disturbed area of the mine surface facilities and return the flow to the native surface drainage channel below the mine bench. The ditches encircle the mine disturbance. One ditch conveys surface flow along the west side of the mine facilities to the native channel, while the corresponding ditch drains east and south above the mine portal and down the east side of the mine bench and surface facilities to the native channel. These open earthen channels will be sized to contain the precipitation events as required by regulation. The channels will be stabilized with a combination of vegetation and riprap (where necessary).

The sediment pond at the southeast corner of the mine bench has been constructed to provide adequate sediment storage volume, provide adequate detention time to allow the effluent from the ponds to meet State and Federal effluent limitations, contain the ten-year, 24-hour storm event, and contains a primary spillway at elevation 7,223 feet above mean sea level (amsl), and an emergency spillway at 7234 feet amsl. These spillways are both 24-inch CMP pipe risers with oil skimmers. The spillways are always open. They will discharge when the pond holds 4.36 acre-feet and 5.22 acre-feet, respectively. Detailed plans, certifications and maps are found in Appendix 10.11 and Figure 9-9a-c.

Periodic sediment removal sufficient to maintain adequate volume for the design event will occur. The pond is constructed to ensure against excessive settlement, be free of sod, large roots, frozen soil, and acid- or toxic-forming coal-processing waste; and is compacted properly. The faces of the pond embankment will be stabilized with vegetation. It will be normally dry. The pond is unlined and captured runoff is allowed to evaporate and infiltrate to alluvium.

### **7.3.10 817.47 — Hydrologic balance: Discharge structures.**

Discharge from sedimentation ponds, permanent and temporary impoundments, coal processing waste dams and embankments, and diversions is controlled by energy dissipators, riprap channels, and other devices, where necessary, to reduce erosion, to prevent deepening or enlargement of stream channels, and to minimize disturbance of the hydrologic balance. Discharge structures would be designed according to standard engineering design procedures.

### **7.3.11 817.49 — Impoundments.**

There are no impoundments at the King II Mine meeting the Class B or C criteria for dams in the U.S. Department of Agriculture, Soil Conservation Service Technical Release No. 60 (210-VI-TR60, Oct. 1985), “Earth Dams and Reservoirs.”

### **7.3.12 817.56 — Post mining rehabilitation of sedimentation ponds, diversions, impoundments, and treatment facilities.**

Before abandoning a permit area or seeking bond release, GCC would ensure that all temporary structures are removed and reclaimed, and that all permanent sedimentation ponds and diversions meet the requirements of this chapter for permanent structures, have been maintained properly, and meet the requirements of the approved reclamation plan for permanent structures and impoundments. The operator would renovate such structures if necessary to meet the requirements of this chapter and to conform to the approved reclamation plan.

### **7.3.13 817.57 — Hydrologic balance: Stream buffer zones.**

Although the King II mine will undermine the head of Schoolhouse Canyon and an unnamed gully just west of the surface facilities, both of these surface drainage areas are narrow gulches with no significant alluvium, no identified seeps, and only episodic flow. Thus, mining will not affect any surface water and no stream buffer zones are designated.

### **7.3.14 817.59 — Coal recovery.**

The King II Mine is an underground coal mining operation employing room and pillar design and techniques for extraction of the coal resource from the upper Menefee seam. The engineering and design of the mine require that coal reserves be divided into sections or panels convenient for extraction and in alignment with the mains to facilitate access and extraction. Rooms (larger open areas from which coal is extracted) are developed. Coal pillars are left at the periphery of the rooms to support the main roof. The size, location, and number of rooms and pillars are determined by the physical characteristics (thickness, load bearing capability, presence of non-coal inclusions) of the coal in each location of the mine. With the completion of a given panel or section (when all minable coal has been extracted), the remaining pillars are mined as the operation retreats from the panel. In this way, the recovery of the coal is maximized.

### **7.3.15 817.61 — Use of explosives: General requirements.**

During preliminary excavations at the King II portal area, a hard sandstone stratum was uncovered that may require surface blasting to break and loosen this stratum to facilitate excavation of the portal bench. The surface blasting plan is designed to address this stratum at

the portal bench and any other areas at the King II Mine facilities area. GCC would comply with all applicable State and Federal laws and regulations in the use of explosives.

GCC Energy would retain a licensed Colorado blaster to undertake surface blasting activities and will not store explosives on site (except during the times the blaster is present and preparing the shot). Certificates of blaster certification would be carried by blasters or would be on file at the permit area during blasting operations. A blaster and at least one other person would be present at the firing of a blast. Any blaster who is responsible for conducting blasting operations at a blasting site would: (i) Be familiar with the site-specific performance standards; and (ii) Give direction and on-the-job training to persons who are not certified and who are assigned to the blasting crew or assist in the use of explosives.

There are no dwellings, public buildings, schools, church, or community or institutional buildings within one half mile of any blasting area, nor is the blasting area within 500 feet of an active or abandoned underground mine. Thus, blast designs are not required to be submitted.

#### **7.3.16 817.62 — Use of explosives: Preblasting survey.**

Because blasting will not be conducted within one-half mile of any dwellings or structures, no pre-blast surveys are anticipated to be conducted.

#### **7.3.17 817.64 — Use of explosives: General performance standards.**

GCC Energy will publish a blasting schedule between 10 and 20 days prior to initiating the surface blasting program in the Durango Herald, the newspaper of general circulation in the area of the mine.

The blasting schedule will include:

- the location of blasting
- time periods during which blasting will occur
- measures to control access to the blasting area
- the pre-blast warning and all-clear audible signals
- the unavoidable hazardous conditions which would require blasting outside the approved blasting schedule

If changes to the blasting schedule are necessary, the blasting schedule notice will be republished.

All blasting would be conducted between sunrise and sunset unless nighttime blasting is approved by the regulatory authority based upon a showing by the operator that the public will

be protected from adverse noise and other impacts. The regulatory authority may specify more restrictive time periods for blasting.

**7.3.18 817.66 — Use of explosives: Blasting signs, warnings, and access control.**

A blast warning will be employed prior to and after surface blasting at the mine. The pre-blast warning will consist of an audible oscillating siren one-minute long at one minute intervals for the three minutes prior to the blast. The post-blast all clear signal will consist of five short air blasts of the siren ten seconds apart, repeated three times.

Site access control will consist of personnel clearing the blast area of all non-blast related personnel and barricading the blast area with heavy equipment at all access points (roads and trails into to blast area). The barricades will be maintained for fifteen minutes prior to the blast and until the last all-clear signal has sounded.

**7.3.19 817.67 — Use of explosives: Control of adverse effects.**

Blasting at the King II Mine would be conducted to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in the course, channel, or availability of surface or ground water outside the permit area.

Because there are no dwellings, public buildings, schools, church, or community or institutional buildings within one half mile of any blasting area, nor is the blasting area within 500 feet of an active or abandoned underground mine, flyrock and ground vibrations would not be monitored.

**7.3.20 817.68 — Use of explosives: Records of blasting operations.**

A surface blasting record form will be completed and retained at the mine office for at least three years after each surface blast at the mine.

**7.3.21 817.71 — Disposal of excess spoil: General requirements**

Approximately 20,500 cubic yards of material was removed from the portal area and used to construct the mine bench and base for all mine surface facilities. Additional overburden may be excavated in the construction of the sediment pond. No overburden will be stockpiled as occurs in surface coal mining operations. There will be no overburden disposal sites at the King II mine.

Spoil material from the earth worked areas is minimal and will remain in the general facilities area in the west drainage area for use as fill. Diversion culverts and channels will divert up-slope runoff around the disturbed areas. The reclamation plan calls for utilizing the soil stored in the Bermed Topsoil Storage areas for re-vegetating these areas upon abandonment of the mine.

A temporary waste rock storage area would be used for temporary storage of underground mine waste rock waiting to be transported the refuse pile at the King I mine.

**7.3.22 817.72 — Disposal of excess spoil: Valley fill/head-of-hollow fills. N/A**

Excess spoil will not be disposed in valley fills or head-of-hollow fills.

**7.3.23 817.73 — Disposal of excess spoil: Durable rock fills. N/A**

There is no durable rock spoil generated at the King II Mine.

**7.3.24 817.74 — Disposal of excess spoil: Preexisting benches. N/A**

Excess spoil will not be disposed on a preexisting bench.

**7.3.25 817.81 — Coal mine waste: General requirements**

Coal mine waste generated at King II Mine is transported to an approved disposal site at King I Mine (CDRMS Permit C-1981-035 MR-41, Appendix 10.2) in a controlled manner to minimize adverse effects of leachate and surface-water runoff on surface and ground water quality and quantity; ensure mass stability and prevent mass movement during and after construction; ensure that the final disposal facility is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use; not create a public hazard; and prevent combustion.

The disposal facility has been designed using current, prudent engineering practices meets design criteria established by the CDRMS. A qualified registered professional engineer, experienced in the design of similar earth and waste structures, has certified the design of the disposal facility. The disposal facility has been designed to attain a minimum long-term static safety factor of 1.5 and the foundation and abutments are stable under all conditions of construction.

Sufficient foundation investigations, as well as any necessary laboratory testing of foundation material, would be performed in order to determine the design requirements for foundation stability. The analyses of the foundation conditions would take into consideration the effect of underground mine workings, if any, upon the stability of the disposal facility.

If any examination or inspection discloses that a potential hazard exists, the regulatory authority would be informed promptly of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented, the regulatory authority would be notified immediately. The regulatory authority would then notify the appropriate agencies that other emergency procedures are required to protect the public.

No coal mine waste will be returned to underground workings at the King II Mine.

**7.3.26 817.83 — Coal mine waste: Refuse piles.**

No coal waste refuse piles are located on the King II Mine site.

**7.3.27 817.84 — Coal mine waste: Impounding structures. N/A**

No coal waste impounding structures are located on the King II Mine site.

**7.3.28 817.87 — Coal mine waste: Burning and burned waste utilization. N/A**

No coal waste refuse piles are located on the King II Mine site.

**7.3.29 817.89 — Disposal of noncoal mine wastes.**

Salvageable steel, concrete and other construction materials will be removed from the mine site to a salvage yard or regulated landfill, if not needed for portal backfill. Materials will be stored while awaiting removal.

All debris, acid-forming and toxic-forming materials constituting a fire hazard are disposed of by a local waste removal company such as Waste Management or Baker Sanitation. Grease, lubricants, paints, flammable liquids, etc. are stored in the Fuel Storage Building with proper containment and collected on a regular basis by a certified hazardous material collection company such as Safety Kleen.

At no time would any noncoal mine waste be deposited in a refuse pile or impounding structure, nor would any excavation for noncoal mine waste disposal be located within 8 feet of any coal outcrop or coal storage area.

**7.3.30 817.95 — Stabilization of surface areas.**

GCC designed and developed the King II Mine surface facilities to minimize the footprint of disturbance. Post-construction, GCC reseeded surface facilities boundary areas, sediment control system areas, and topsoil stockpile areas to promote stabilization, sediment control, and habitat development. Faces of pond embankments will be stabilized with vegetation. The topsoil pile will be stabilized using the seed mix proposed for final reclamation. Open earthen channels used for stormwater surface flow will be stabilized with a combination of vegetation and riprap (where necessary).

**7.3.31 817.97 — Protection of fish, wildlife, and related environmental values.**

Noise and air emissions during mining may cause a temporary disturbance to wildlife within the area of active surface facilities during operations. Some wildlife species may be temporarily displaced within areas of surface operations. Common wildlife species such as raccoons, coyotes, deer, passerine birds, and raptors will continue to use the mine site and adjacent areas during mining operations and the site itself. Bird species will use the periphery of the site and the site itself opportunistically, if prey or food species are present. Wildlife species have been observed within and adjacent to the active operations and have become adjusted to the operations. In some cases, wildlife (such as deer, small mammals, and birds) are less prone to predation within the active surface operations.

A raptor protection plan is already on file with the Colorado Division of Reclamation, Mining & Safety. If protected species are observed within the King II Mine affected area, and the reasonable potential exists for negative direct effects from the King II mining operation, GCC will consult with the regulatory authority (U.S. Fish and Wildlife Service or Colorado Parks and Wildlife) to minimize or mitigate any negative effects. Direct negative effects, as identified by federal and state statute include, but are not limited to, destruction of nests, “takings” of individuals, eggs, or young, and destruction or adverse modification of critical habitat. In addition to compliance with the federal Bald and Golden Eagle Protection Act, the Migratory Bird Act, the Endangered Species Act, and the Nongame, Endangered and Threatened Species Conservation Act, GCC will ensure compliance with the performance requirements of CDRMS Rule 4.18 as applicable.

GCC designed and developed the King II Mine surface facilities to minimize the footprint of disturbance. Further, GCC retained native trees, shrubs, and herbaceous vegetation within the surface facilities to minimize habitat fragmentation and disruption to wildlife utilizing the area.

**7.3.32 817.99 — Slides and other damage.**

If a slide occurs which may have a potential adverse effect on public property, health, safety, or the environment, GCC Energy would notify the Division by the fastest available means and comply with any remedial measures required by the Division.

**7.3.33 817.100 — Contemporaneous reclamation.**

Reclamation efforts, including but not limited to backfilling, grading, topsoil replacement, and revegetation, on all areas affected by surface impacts incident to an underground coal mine would occur as contemporaneously as practicable with mining operations

**7.3.34 817.102 — Backfilling and grading: General requirements.**

Backfilling and grading will be undertaken to achieve the post-mining topographic configuration shown on Figure 9-10.

**7.3.35 817.106 — Backfilling and grading: Previously mined areas.**

There are no previously mined areas on the King II Mine site.

**7.3.36 817.107 — Backfilling and grading: Steep slopes. N/A**

There are no steep slopes on the King II Mine site that are disturbed and require backfilling or grading.

**7.3.37 817.111(a-d) — Revegetation: General requirements.**

GCC will establish vegetative cover on King II Mine in all disturbed areas that is diverse, effective, and permanent; comprise species native to the area, or of introduced species where desirable and necessary to achieve the approved postmining land use and approved by the regulatory authority; at least equal in extent of cover to the natural vegetation of the area; and capable of stabilizing the soil surface from erosion.

The species would be compatible with the approved postmining land use; have the same seasonal characteristics of growth as the original vegetation; be capable of self-regeneration and plant succession; be compatible with the plant and animal species of the area; and meet the requirements of applicable State and Federal seed, poisonous and noxious plant, and introduced species laws or regulations.

The regulatory authority may grant exception to these requirements when the species are necessary to achieve a quick-growing, temporary, stabilizing cover, and measures to establish permanent vegetation are included in the approved permit and reclamation plan.

There are no cropland postmining land uses planned for the King II Mine.

**7.3.38 817.113 — Revegetation: Timing.**

With the significance and dominance of cool season graminoid species in the rabbitbrush/big sage mixed shrub-land community, emphasis should be placed on ensuring germination and survival of these species in the re-vegetation seed mixes. Precipitation during the growing season (April-September) decreases from April through June, increases in July and August, and then decreases slowly through the end of the growing season. Given this precipitation distribution, two seeding windows are proposed. A spring seeding window would take advantage of increased mid-late summer precipitation, encouraging summer growth and allowing plants to add sufficient biomass prior to winter. A second autumn seeding window

allows seeding into relatively moist ground, but prevents significant seedling growth prior to freezing, allowing seeds to remain dormant over the winter with adequate moisture for early germination in the spring.

Two optimal windows for re-vegetation seeding are proposed dependent on the observations described above; a spring window from March 15 to June 15 and a fall window from August 15 to November 15.

Vegetation seeding will occur during the first planting window after completion of work within the re-graded and topsoiled area.

### **7.3.39 817.114 — Revegetation: Mulching and other soil stabilizing practices.**

Mulch will be employed to minimize loss of seed due to wind and water, and to provide additional moisture retention. Any of the following mulch methods may be employed depending on time of anticipated reseeding, mulch availability, and site specific factors such as slope and aspect.

**Hay/Straw Mulch** - Hay and/or straw mulch will 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 must be certified as native and weed and pest free in accordance with U.S. Department of Agriculture regulations. Hay or straw mulch will be applied at a rate of two (2) tons per acre and crimped or disked into the surface of the soil. Application should be perpendicular to the predominant wind direction and/or the direction of surface water flow.

**Hydromulch and Tackifier** - Hydromulch and tackifier will be used to anchor seed and any amendments to the soil surface on revegetation areas where the slope is greater than 2.5:1 (horizontal: vertical). Hydromulches to be used would be inert wood and plant fiber products (cellulose), and acceptable tackifiers would be comprised of plant gums or organic co-polymers. Hydromulch and tackifiers should be applied with a hydromulcher at a manufacturer's recommended rate of 2,500 pounds of hydromulch and tackifier per acre. Hydromulch and tackifier should be applied after seeding, and any application of other soil amendments.

**Stubble Mulch** - As an alternative to hay or straw mulch in the same applications, stubble mulch (nurse or cover crop) may be employed. This mulch should only be employed in areas accessible to mowing, should that be necessary to control mulch growth or spread. Suitable mulches to be employed would include sterile crosses of agricultural wheat and native wheatgrasses (such as the product Regreen®), sorghum, barley, or other agricultural crop grass. The local Natural Resource Conservation Service office, Agricultural Extension office, or other

crop management agency will be contacted to determine stubble mulch strip width, direction, and seeding rate for specific stubble mulch planting.

#### **7.3.40 817.116 — Revegetation: Standards for success.**

The success of planted and seeded vegetation will be monitored biennially after initial planting and seeding. Monitoring will consist of qualitative and quantitative vegetation sampling techniques that measure the vegetation cover, species diversity and the survival of plant species within the revegetated areas.

Revegetation sampling methods employed to measure the success of revegetation at the King II Mine will comply with those specified by the regulatory authority at the time of revegetation monitoring and bond release. Currently Colorado Division of Reclamation, Mining and Safety (CDRMS) Rule 4.15.11 specifies methods for use in vegetation sampling. Any of those specified methods may be employed at the King II Mine for vegetation sampling.

In consultation with the CDRMS in 2005, the big sage mixed shrubland community was delineated and quantitatively sampled. The Division agreed that a segment of that vegetation community (located outside the surface facilities disturbed area) would be utilized as a reference area for revegetation success determinations. Since the reference area was a subset of the vegetation community quantitatively sampled, there was no need for a separate statistical evaluation. The location of the reference area is shown in Figure 9-8. The reference area is signed to prohibit unauthorized access; however, it is not fenced, providing access to wildlife.

The reference area will provide revegetation success criteria for total vegetation cover and total herbaceous production. These parameters will be sampled during the same season and in the same manner as the revegetated area to establish the success criteria for total vegetation cover and total herbaceous production at the time of revegetation sampling for monitoring or bond release.

**Success Criteria: Total Vegetation Cover and Total Herbaceous Production** - Determination of revegetation success in achieving the total vegetation cover or total herbaceous production success criteria will be based on quantitative statistical means. The Student's *t*-test is a robust statistical test to evaluate the equivalency of two sample means. This test should be employed to test the null hypothesis that the sample mean for revegetated parcel cover or production is less than 90 percent of the value of the corresponding cover success criterion. Rejection of the null hypothesis will indicate achievement of the success criteria for total vegetation cover and total herbaceous production.

**Success Criterion: Species Diversity** - Species diversity success criteria for revegetated parcels are based on the number of species, species richness, and relative abundance in native vegetation communities. Baseline vegetation cover data for the rabbitbrush/big sage mixed shrubland community were collected and analyzed to determine the dominant plant species of the community, as well as their lifeforms and seasonality. Dominance was determined through selection of species that contributed three (3) percent or more to relative cover in the baseline sampling. Six species contributed this amount of relative cover; one introduced annual cool-season grass, two native cool-season grasses, one introduced cool-season grass, and two shrubs.

Accounting for the undesirability of re-establishing an annual introduced grass, and to reflect more typical species diversity in the revegetated area, a total of six perennial plant species should be reestablished. Of these species, three should be graminoid, one a forb, and two shrubs in life form. All qualifying species should be cool season, deciduous, or evergreen. A minimum of four species should be native. Both bunchgrasses and sod-forming grasses should be represented, though no specific number of each is necessary. No single species should contribute more than 40 percent mean relative cover or less than two percent mean relative cover for graminoids or one percent relative cover for forbs in the revegetated area. Species diversity will have been successfully achieved when the above specifications are met.

**Success Criterion: Woody Plant Density** - Current woody plant density within the rabbitbrush/big sage mixed shrubland is 2,977 individuals per acre. Observation of the community indicates that the current density (particularly of rubber rabbitbrush) is overly high for the post-mining use of rangeland. Neither rubber rabbitbrush nor big sage is particularly desirable for livestock. For this reason, woody plants are not proposed for re-establishment within any area identified as within the rabbitbrush/big sage mixed shrubland vegetation community of the mine site. Woody plants are proposed to be re-established within all areas disturbed and subsequently reclaimed and revegetated within the area identified pre-mine as the pinyon-juniper vegetation community. Within the overall disturbance of 22.36 acres, approximately three acres of pinyon-juniper woodland is proposed for disturbance. When revegetating within the area identified as the pinyon-juniper woodland community pre-mine, additional shrub species will be added to the reclamation seed mix as depicted on the seed mix table to facilitate achieving the designated post-mining land use of wildlife habitat.

In the area identified pre-mine as pinyon-juniper woodland, a woody plant density standard of 200 stems per acre is proposed. Achievement of woody plant density will have occurred, in the area identified pre-mine as pinyon-juniper woodland, when the sampled density is statistically

equal to 200 stems per acre. This standard achieves an average woody density of one stem per 218 square feet (or one stem on fifteen foot centers).

**7.3.41 817.121 — Subsidence control. 2.05.6 page 11-12**

These beds rise to the base of the Cliff House sandstone an average of twenty feet above the coal seam. 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 second mining.

No significant hydrologic consequences of mining are anticipated. All coal to be removed from the mine lies above the potentiometric surface of Hay Gulch, the only known aquifer in the area. Therefore, there should be no diminution of water quality or quantity to Hay Gulch from the mine workings or any subsidence related to mining.

**Worst Possible Consequences of Subsidence** - The two-track road following the ridge line west of the project area is the main structure on permitted or adjacent lands which could suffer damage due to the effects of subsidence. In the event that a surface subsidence crack were to intersect the road, it is possible that some repair of the road would be required to allow its continued use. This road is used primarily by the surface grazing lease holders of the State of Colorado land for access to cattle rangelands in the north part of Section 36. Where subsidence cracks have intersected two track roads above the existing King I Mine, repairs were made by shoveling less than a pickup truck load of “road base” into the crack.

If subsidence cracks damage any barbed wire fence within the permit area (a fencepost could be dislodged or strands of barbed wire could stretch and break or sag), GCC Energy, LLC will repair said fences without charge to the surface grazing lease holder, or will reimburse the lease holder for any repairs necessary. The buildings and structures on and around the surface facility area of the mine will not be damaged by subsidence because there are no minable coal seams beneath this area.

**Subsidence Monitoring Program** - The operator will inspect a fence for subsidence damage no later than in the spring after the fence is undermined. The results of the inspection will be submitted to CDRMS within 60 days after the inspection. The operator will inspect the two-track road following the ridge line west of the project area (see Map King II-005) for subsidence damage no later than in the spring after the road is undermined. The results of the inspection will be submitted to the Division within 60 days after the inspection.

**7.3.42 817.122 — Subsidence control: Public notice.**

At least 6 months prior to mining, or within that period if approved by the regulatory authority, the underground mine operator shall mail a notification to all owners and occupants of surface property and structures above the underground workings within the modified permit boundary. The notification shall include, at a minimum, identification of specific areas in which mining will take place, dates that specific areas will be undermined, and the location or locations where the operator's subsidence control plan may be examined.

**7.3.43 817.131 — Cessation of operations: Temporary**

(a) GCC would support and maintain all surface access openings to underground operations, and secure surface facilities in areas in which there are no current operations, but operations are to be resumed under an approved permit. Temporary abandonment shall not relieve GCC of its obligation to comply with any provisions of the approved permit.

(b) Before temporary cessation of mining and reclamation operations for a period of thirty days or more, or as soon as it is known that a temporary cessation will extend beyond 30 days, GCC would submit to the regulatory authority a notice of intention to cease or abandon operations. This notice shall include a statement of the exact number of surface acres and the horizontal and vertical extent of sub-surface strata which have been in the permit area prior to cessation or abandonment, the extent and kind of reclamation of surface area which will have been accomplished, and identification of the backfilling, regrading, revegetation, environmental monitoring, underground opening closures and water treatment activities that will continue during the temporary cessation.

**7.3.44 817.132 — Cessation of operations: Permanent**

(a) GCC would close or backfill or otherwise permanently reclaim all affected areas, in accordance with this chapter and per the permit approved by the regulatory authority.

(b) All surface equipment, structures, or other facilities not required for continued underground mining activities and monitoring, unless approved as suitable for the postmining land use or environmental monitoring, would be removed and the affected lands reclaimed.

**7.3.45 817.133 — Postmining land use.**

The proposed post-mining land uses of the proposed permit area are the same as the pre-mining land uses; rangeland, fish and wildlife habitat, and undeveloped land. The post-mining land uses will be achieved through demolition and removal of buildings and mining related structures (including coal), backfilling and grading of the surface facilities area to a post-mining

topography consistent and complimentary to the surrounding topography, replacement of topsoil, and revegetation of the entire mining related disturbance area.

The reclamation plan has been developed to provide a post-mining topography and vegetation community equivalent or better than that there currently. Verification of the utility and capacity of the post-mining land use to support equivalent uses will be undertaken through comparison with the reference area, established to represent the pre-mining condition and utility of the site. Currently, there are no planned uses or land use policies in force for the project area. The reclamation plan has been designed to require no support activities after completion, except for normal management practices (weed control, stock rotation, or others). The reclamation plan is consistent with the requirements of the landowner lease.

GCC Energy, LLC does not propose to change the post-mining land uses from the pre-mining land uses.

#### **7.3.46 817.150 — Roads: General.**

(a) Three primary roads are used at the King II Mine site.

(b) Each road shall be located, designed, constructed, reconstructed, used, maintained, and reclaimed so as to control or prevent erosion, siltation, and the air pollution attendant to erosion, including road dust and dust occurring on other exposed surfaces, by measures such as vegetating, watering, using chemical or other dust suppressants, or otherwise stabilizing all exposed surfaces in accordance with current, prudent engineering practices; control or prevent damage to fish, wildlife, or otheir habitat and related environmental values; control or prevent additional contributions of suspended solids to streamflow or runoff outside the permit area; neither cause nor contribute to, directly or indirectly, the violation of State or Federal water quality standard applicable to receiving waters; refrain from seriously altering the normal flow of water in streambeds or drainage channels; prevent or control damage to public or private property, including the prevention or mitigation of adverse effects on lands within the boundaries of units of the National Park System, the National Wildlife Refuge System, the National System of Trails, the National Wilderness Preservation System, the Wild and Scenic Rivers System, including designated study rivers, and National Recreation Areas designated by Act of Congress; and use nonacid- and nontoxic-forming substances in road surfacing.

(c) The design and construction or reconstruction of roads incorporates appropriate limits for grade, width, surface materials, surface drainage control, culvert placement, and culvert size, in accordance with current, prudent engineering practices, and any necessary design criteria established by the regulatory authority.

(d) No part of any road is in the channel of an intermittent or perennial stream and roads are located to minimize downstream sedimentation and flooding.

(e) Road are maintained to meet the performance standards of this part and any additional criteria specified by the regulatory authority and road damaged by a catastrophic event, such as a flood or earthquake, shall be repaired as soon as is practicable after the damage has occurred.

(f) A road not to be retained under an approved postmining land use shall be reclaimed in accordance with the approved reclamation plan as soon as practicable after it is no longer needed for mining and reclamation operations. This reclamation shall include: closing the road to traffic; removing all bridges and culverts unless approved as part of the postmining land use; removing or otherwise disposing of road-surfacing materials that are incompatible with the postmining land use and revegetation requirements; reshaping cut and fill slopes as necessary to be compatible with the postmining land use and to complement the natural drainage pattern of the surrounding terrain; protecting the natural drainage patterns by installing dikes or cross drains as necessary to control surface runoff and erosion; and scarifying or ripping the roadbed, replacing topsoil or substitute material and revegetating disturbed surfaces in accordance with §§817.22 and 817.111 through 817.116 of this chapter.

#### **7.3.47 817.151 — Primary roads.**

(a) One primary, combination haul/access road would access the mine facilities and coal load-out. The road originates at La Plata County Road 120 and proceeds north to a location south of the mine bench where the road will split forming a one-way loop through the mine facilities. Specific designs and the engineer's certification for this road will be included in Appendix 10.10.

A primary access road to the water tanks is planned. This road will originate at the office building and end at the water tanks. Specific designs and the engineer's certification for this road will be included in Appendix 10.10.

A primary access road to the conveyor/return portal area is planned. This road will originate at the office building and end at the conveyor/return air portal area. Specific designs and the engineer's certification for this road will be included in Appendix 10.10.

(b) Each primary road embankment would have a minimum static factor of 1.3 or meet the requirements established under §784.24(c).

(c) To minimize erosion, the primary roads are located, insofar as is practicable, on the most stable available surface. There are no fords of perennial or intermittent streams by primary roads on the King II Mine.

(d) In accordance with the approved plan, each primary road is constructed and maintained to have adequate drainage control to safely pass the peak runoff from a 10-year, 6-hour precipitation event; drainage pipes and culverts are installed as designed, and maintained in a free and operating condition and to prevent or control erosion at inlets and outlets; drainage ditches are constructed and maintained to prevent uncontrolled drainage over the road surface and embankment; culverts are installed and maintained to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road.

There are no natural stream channels within the King II Mine. There are no low-water crossings on the King II Mine.

(e) Primary roads are surfaced with material approved by the regulatory authority as being sufficiently durable for the anticipated volume of traffic and the weight and speed of vehicles using the road.

#### **7.3.48 817.180 — Utility installations.**

All underground mining activities are conducted in a manner which minimizes damage, destruction, or disruption of utility services. Electrical, septic, and potable water services pass under, or through the permit area, unless otherwise approved by the owner of those facilities and the regulatory authority.

#### **7.3.49 817.181 — Support facilities.**

(a) Support facilities at the King II Mine are operated in accordance with a permit issued for the mine or coal preparation plant to which it is incident or from which its operation results.

(b) Support facilities at the King II Mine are located, maintained, and used in a manner that prevents or controls erosion and siltation, water pollution, and damage to public or private property; and to the extent possible using the best technology currently available minimizes damage to fish, wildlife, and related environmental values; and minimizes additional contributions of suspended solids to streamflow or runoff outside the permit area.

#### **7.3.50 817.200— Interpretative rules related to general performance standards.**

Conclusions of soil suitability for the soils series encountered in the soil resource inventory meet the OSMRE interpretation of rules promulgated in part 817 of this chapter.

GCC does not request an alternative postmining land use in this permit application.

## **7.4 Part 822— Special Permanent Program Performance Standards for Operations in Alluvial Valley Floors**

### **7.4.1 822.11 — Essential hydrologic functions**

(a) GCC Energy, LLC would minimize disturbances to the hydrologic balance by preserving throughout the mining and reclamation process the essential hydrologic functions of an alluvial valley floor not within the permit area.

(b) GCC Energy, LLC would minimize disturbances to the hydrologic balance within the permit area by re-establishing throughout the mining and reclamation process the essential hydrologic functions of alluvial valley floors.

### **7.4.2 822.12 — Protection of agricultural activities**

(a) The King II Mine would not interrupt, discontinue, or preclude farming on alluvial valley floors or cause material damage to the quantity or quality of water in surface or underground water systems that supply alluvial valley floors.

(b) GCC Energy, LLC is not statutorily excluded from this protection.

### **7.4.3 822.13 — Monitoring**

(a) **Alluvial groundwater monitoring** - Currently, the monitoring program includes the following alluvial well locations (Figure 9-11):

- King II Upgradient #1 Monitoring Well (aka Ute Mountain Ute, Permit #210372)
- King II Downgradient #2 Monitoring Well (aka National King Coal LLC, Permit #262656), near the King II portal
- King I Downgradient Monitoring Well (aka Wiltse, unpermitted), near King I portal

Newer well locations are shown on Figure 9-12. The new alluvial well has been installed and sampled once:

Newer well Hay Gulch Upgradient, near confluence of Roberts Canyon (above King I).

The monitoring system would provide sufficient information to allow the regulatory authority to determine that—

(1) The essential hydrologic functions of alluvial valley floors are being preserved outside the permit area or reestablished within the permit area throughout the mining and reclamation process in accordance with §822.11;

(2) Farming on lands protected under §822.12 is not being interrupted, discontinued, or precluded; and (3) The operation is not causing material damage to the quantity or quality of water in the surface or underground systems that supply alluvial valley floors protected under §822.12.

(b) Monitoring would be conducted at adequate frequencies to indicate long-term trends that could affect compliance with §§822.11 and 822.12.

(c) All monitoring data collected and analyses thereof would routinely be made available to the regulatory authority.

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## 9. Figures

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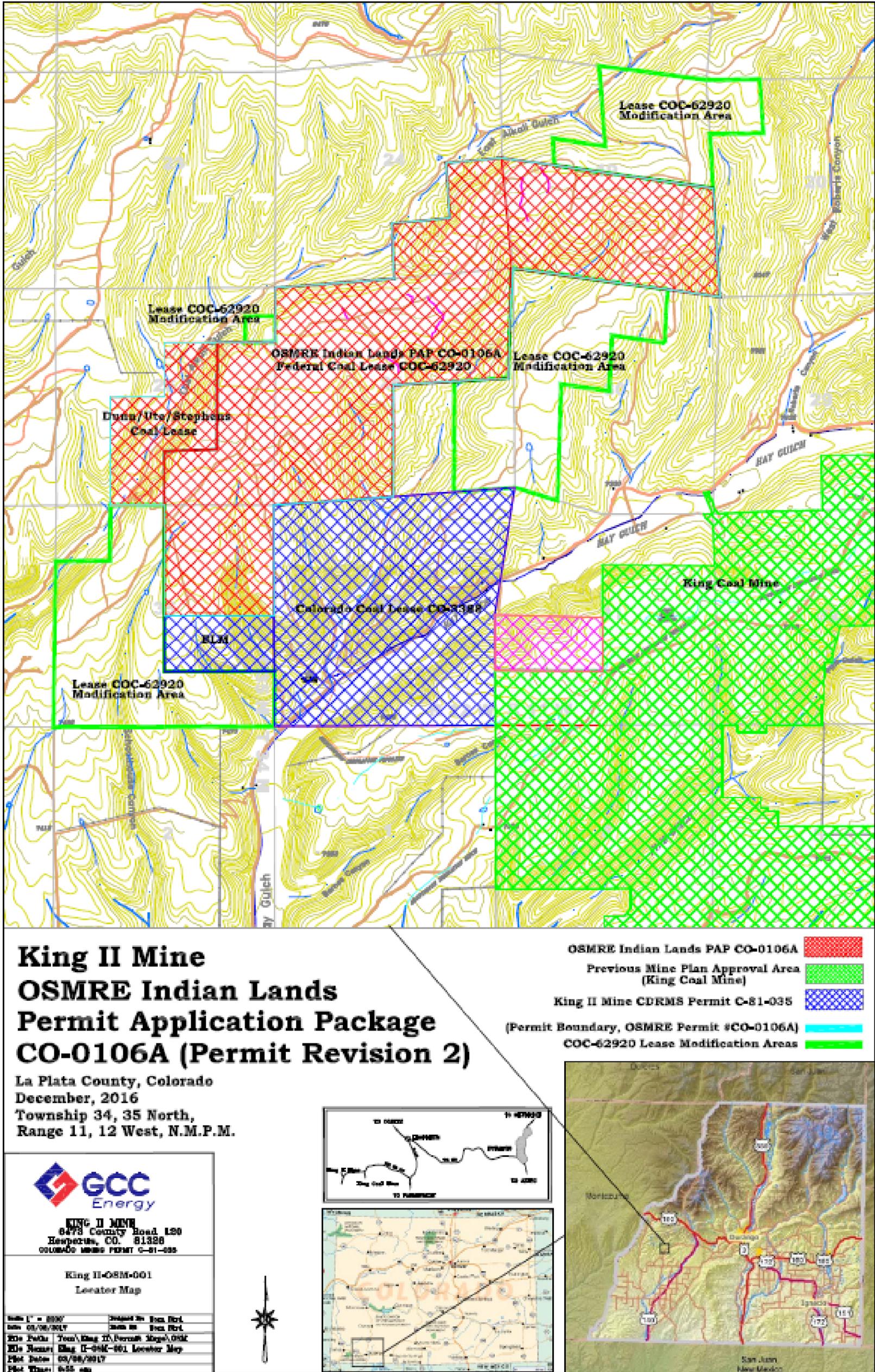


Figure 9-1 . King II Mine Location Map

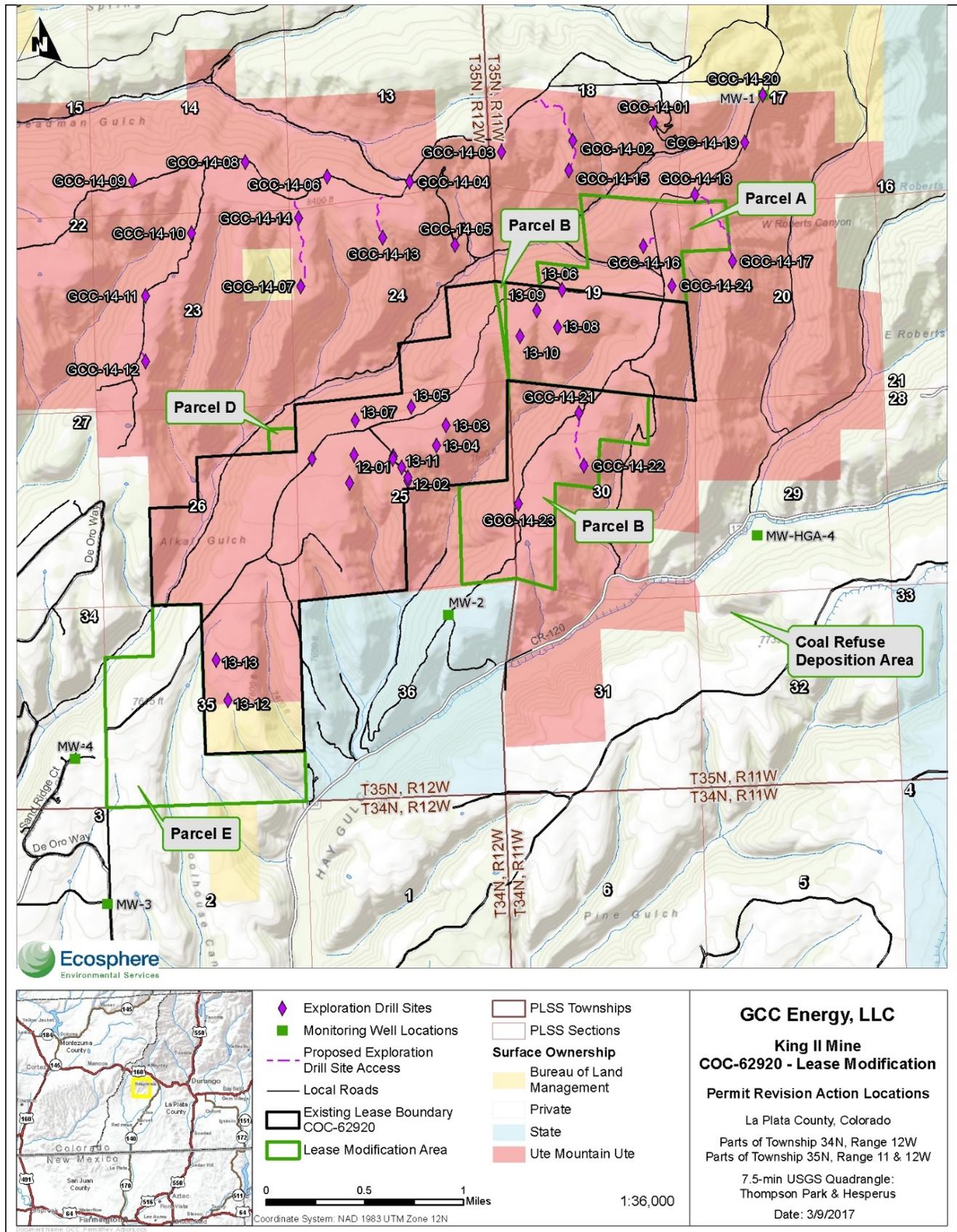


Figure 9-2. Permit Revision Action Locations

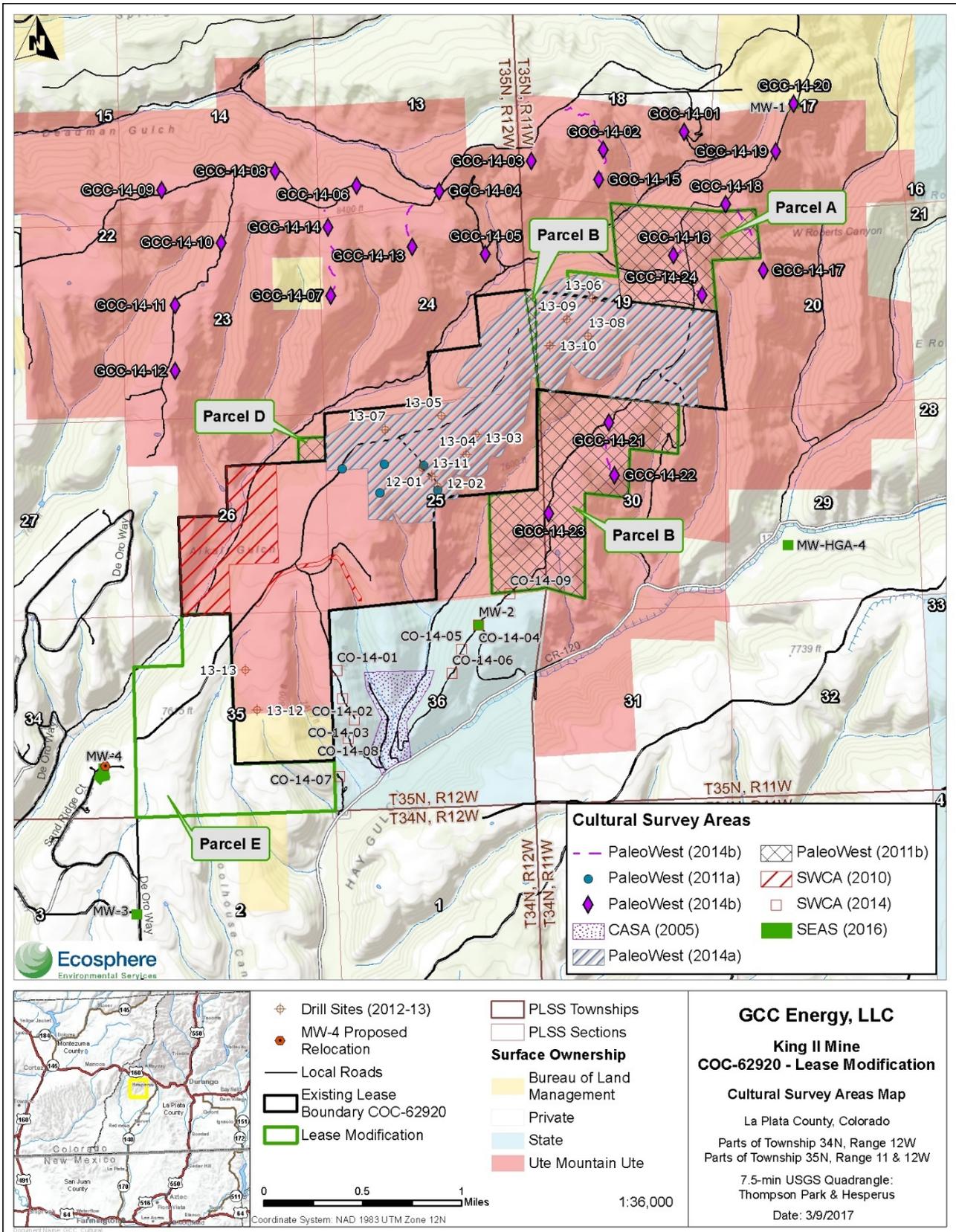


Figure 9-3. Cultural Survey Area Map



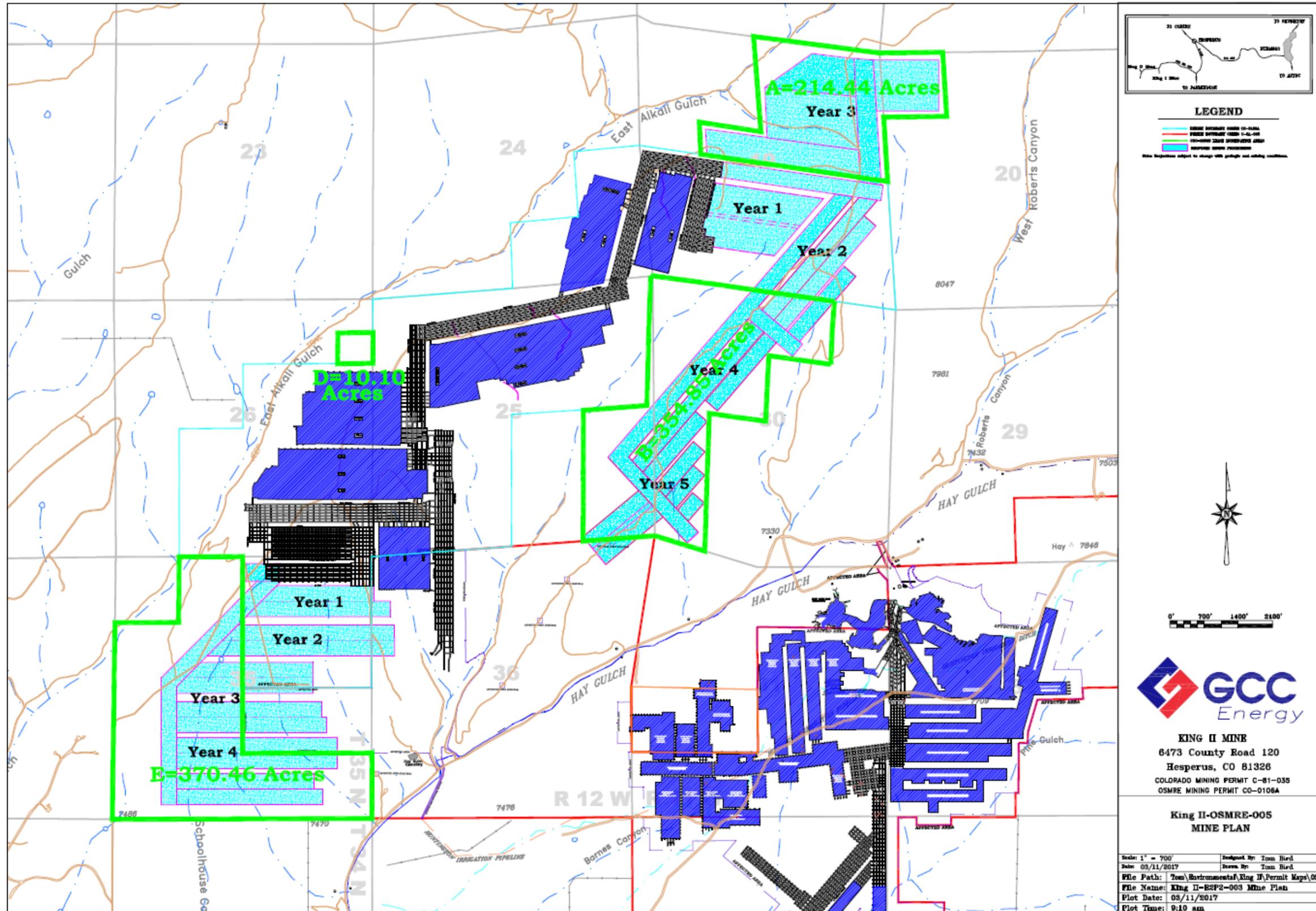


Figure 9-5a. Mine Plan

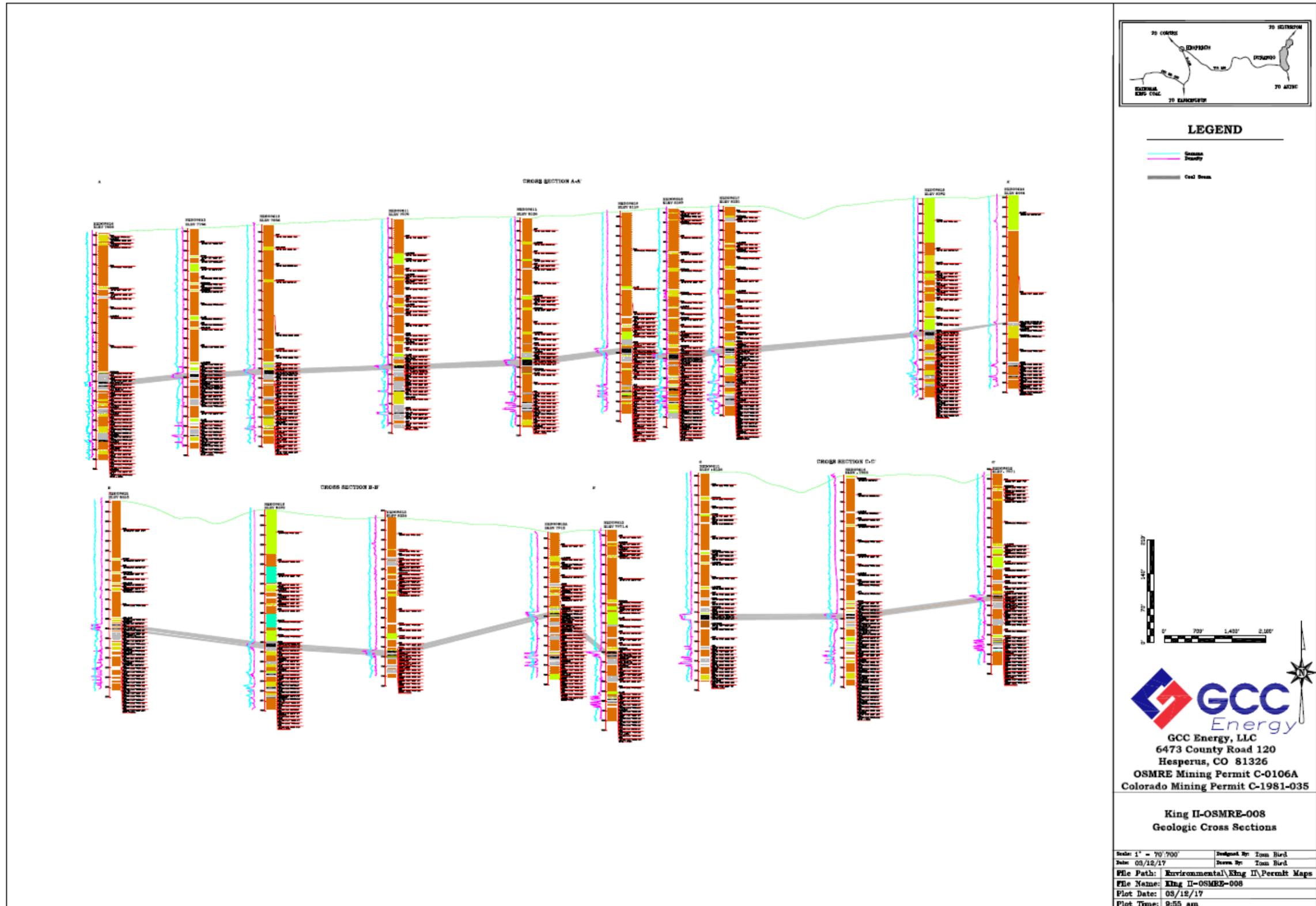


Figure 9 5b. Mine Plan Cross-sections

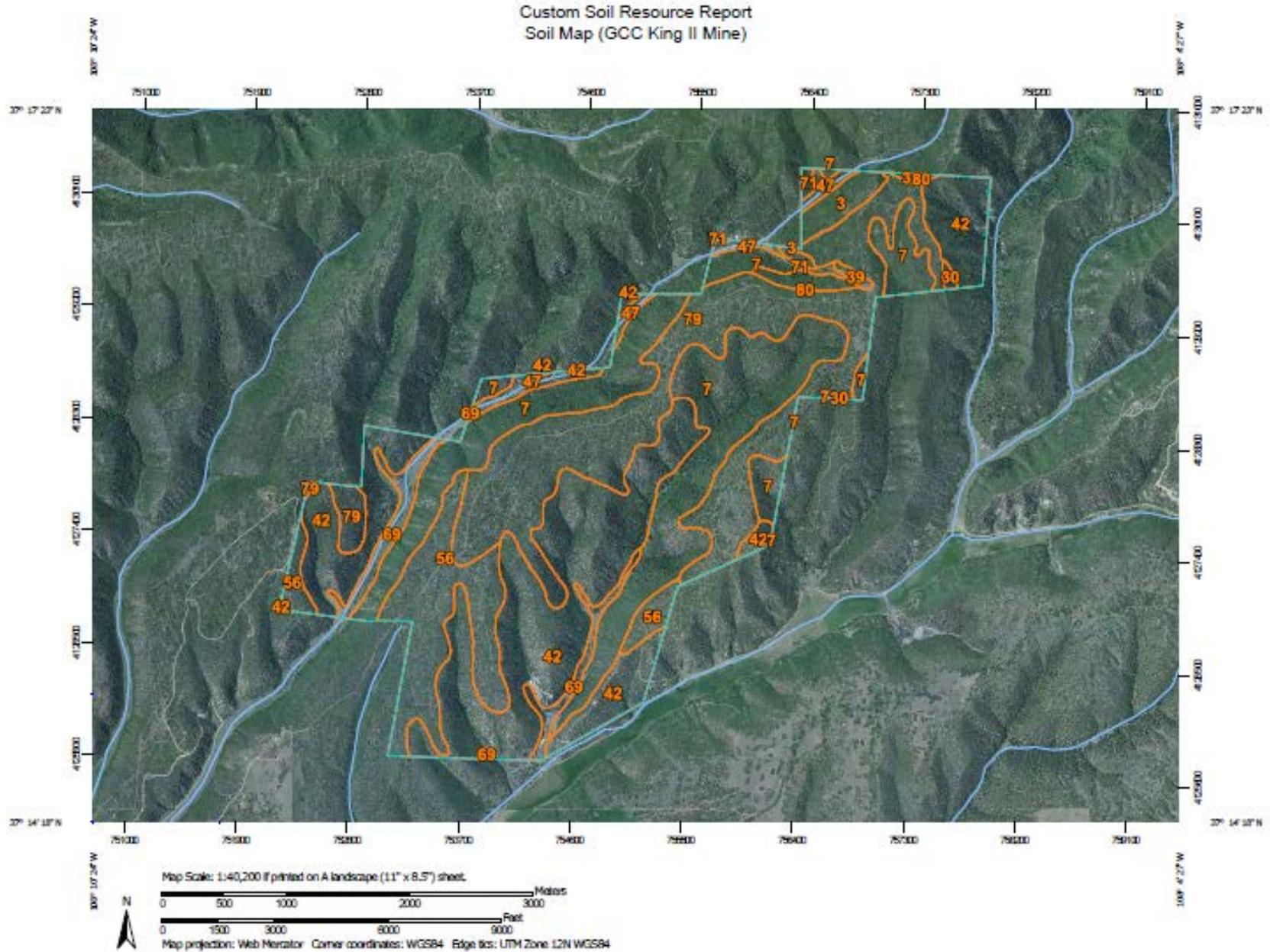


Figure 9-6. NRCS Soil Map



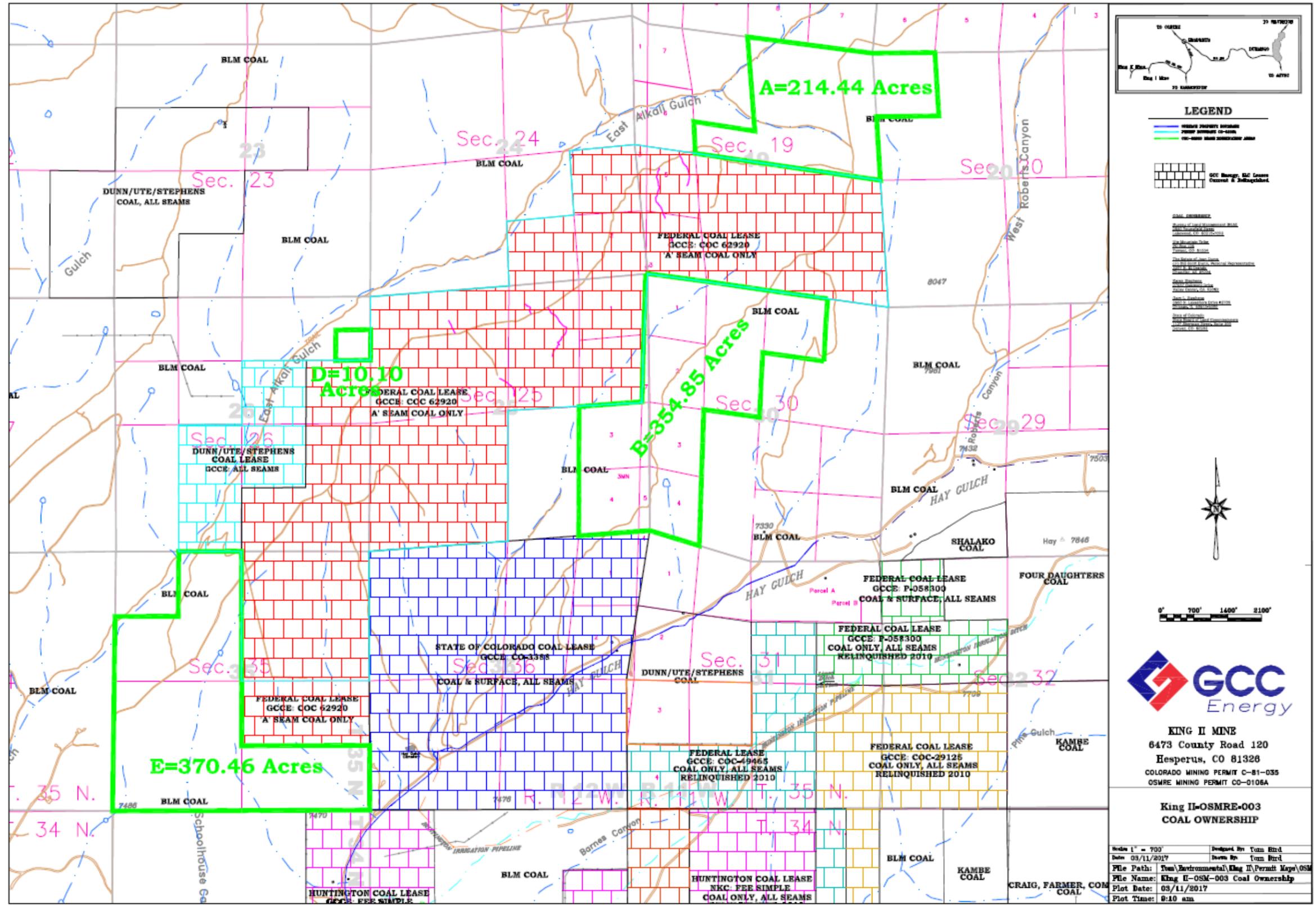


Figure 9-7b. Coal Ownership



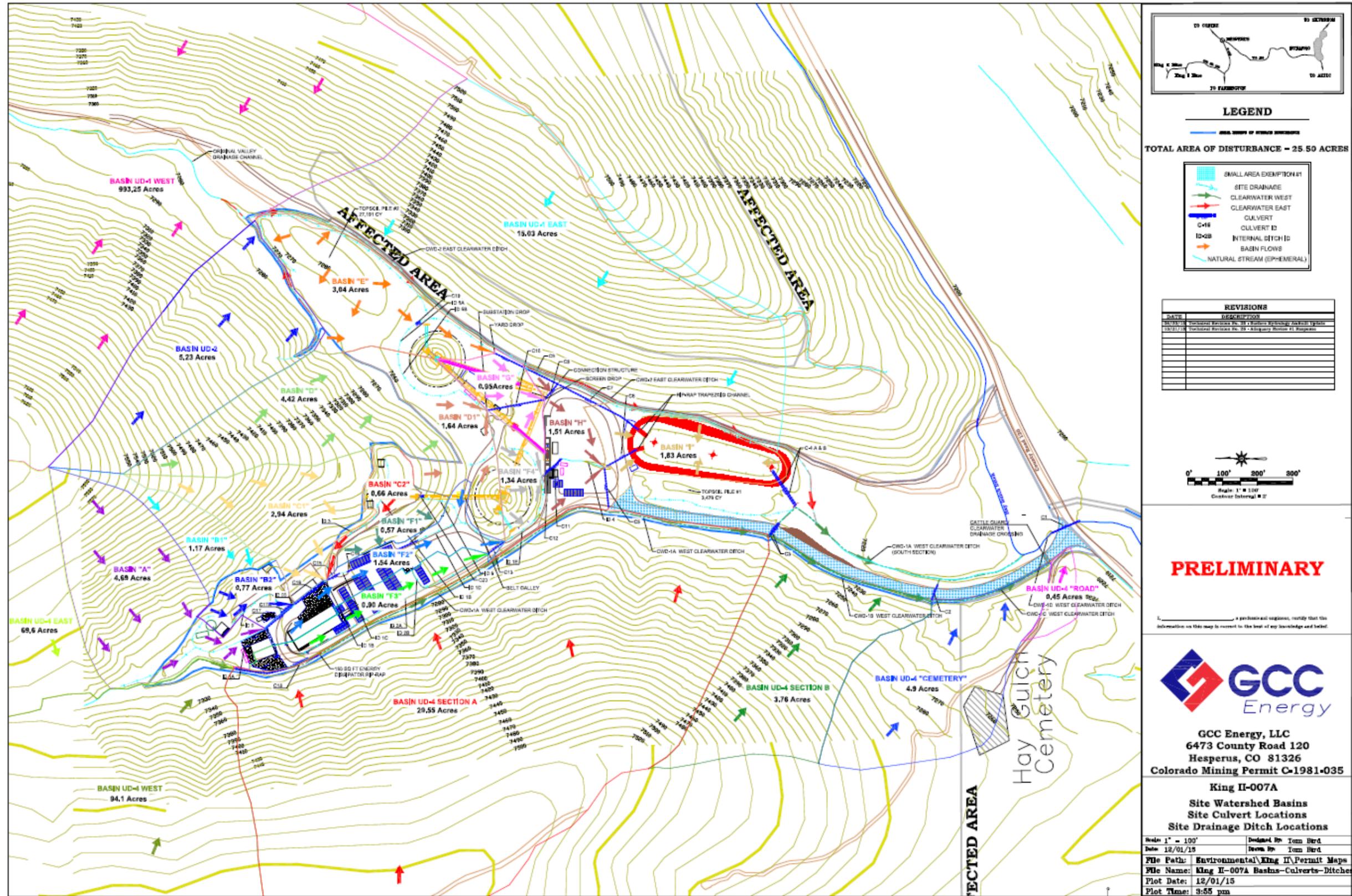


Figure 9-9a. Surface water facilities



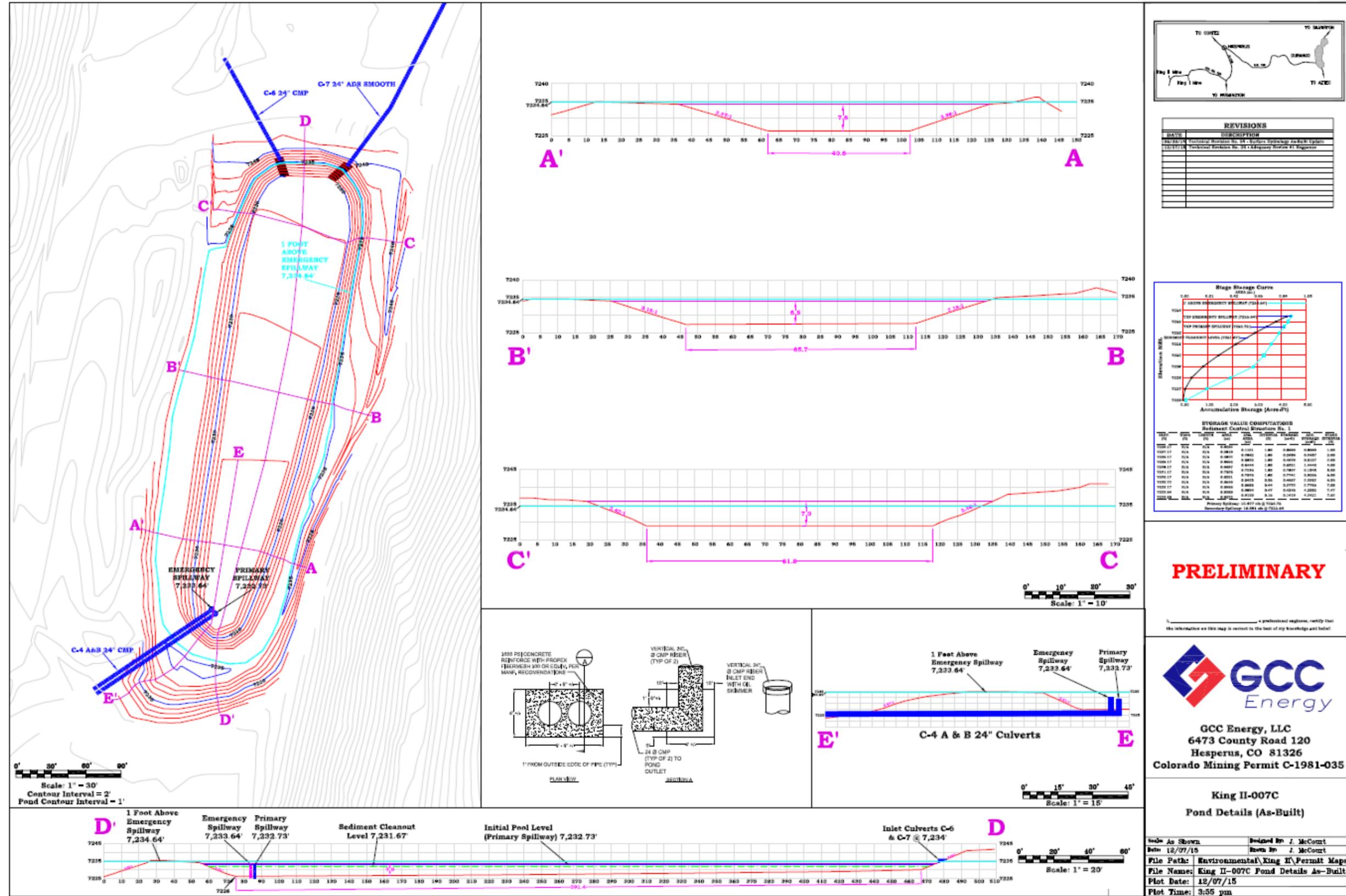


Figure 9-9c. Surface water facilities – Clearwater Ditch Detail

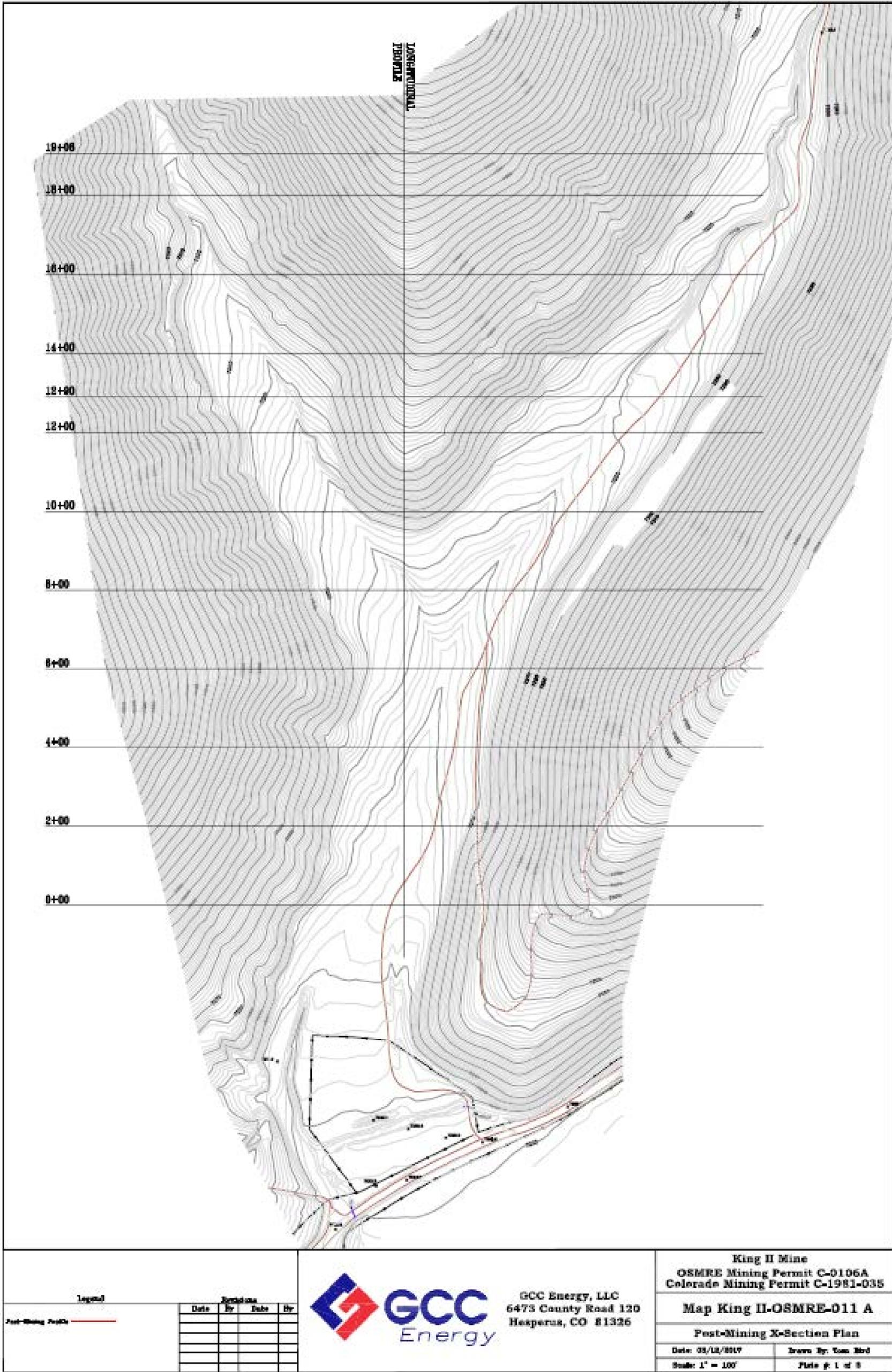


Figure 9-10. Post-Mining surface topography

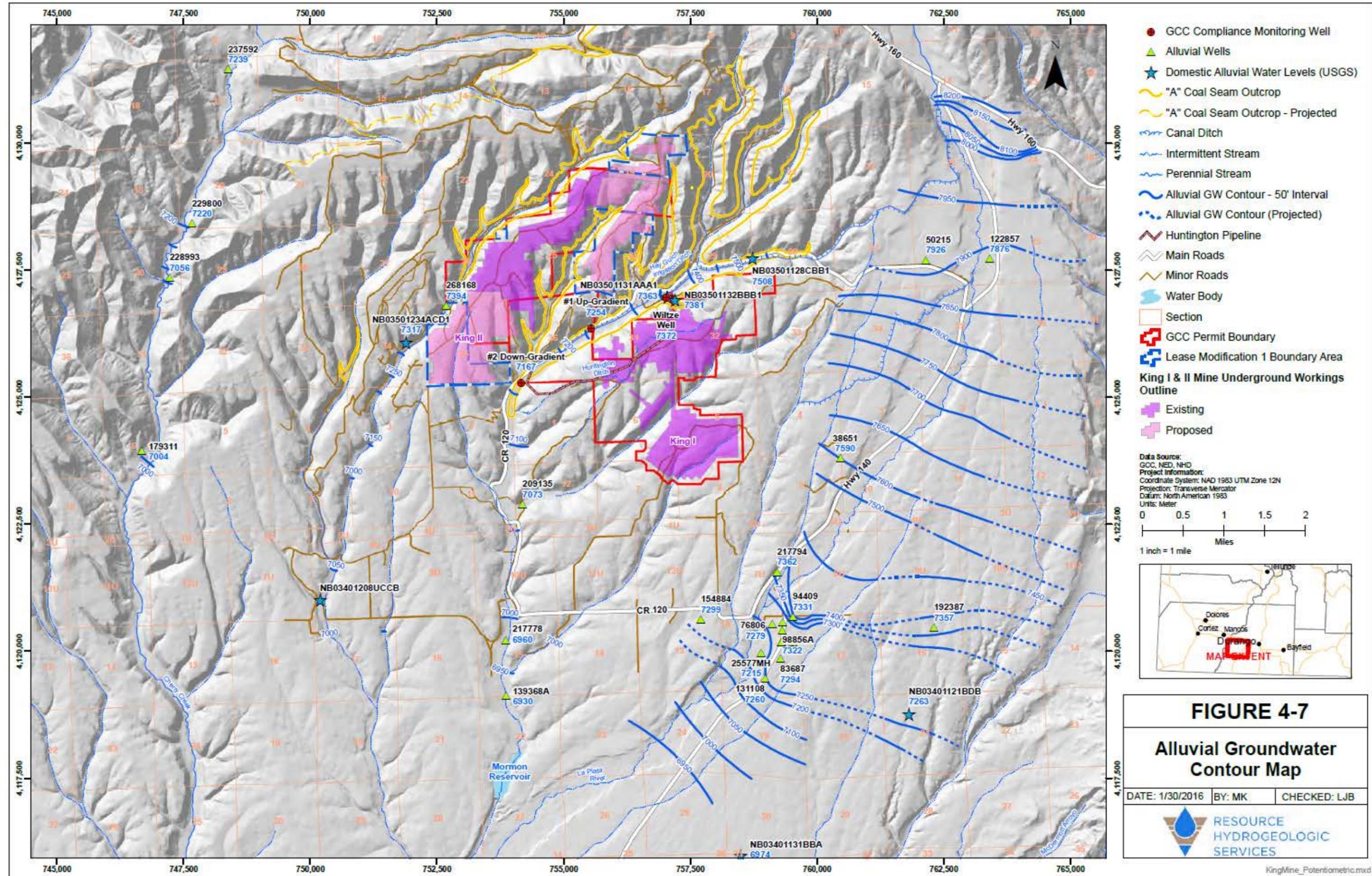


Figure 9-11. Alluvial Groundwater Contour Map (From RHS, Inc. 2016. King I & II Coal Mine Area Hydrologic Study, La Plata County, Colorado)

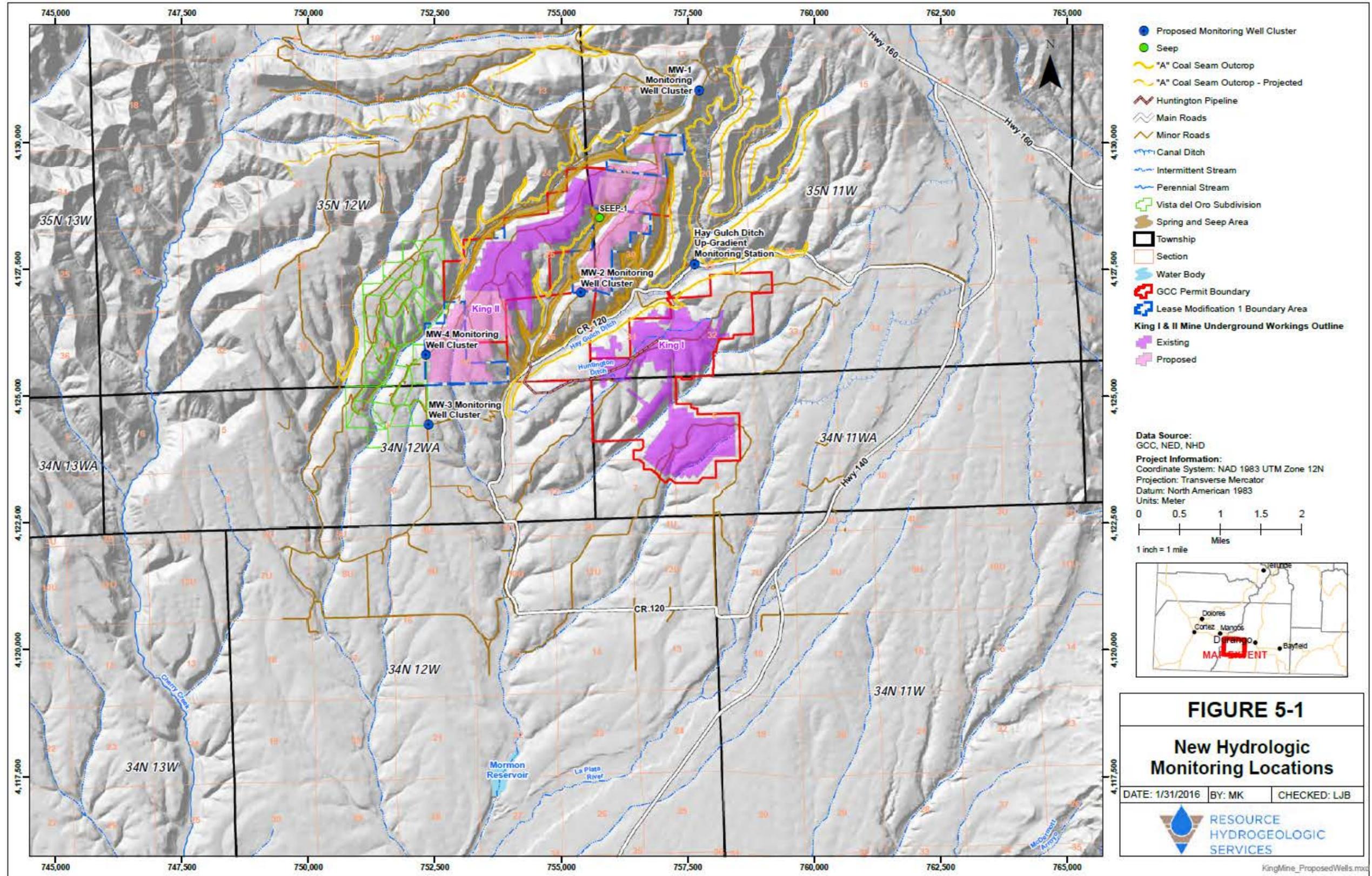


Figure 9-12. New Hydrologic Monitoring Locations (From RHS, Inc. 2016. King I & II Coal Mine Area Hydrologic Study, La Plata County, Colorado)

## 10. Appendices

Appendix	Topic
10.1	Lease and Right of Entry Information
10.2	Licenses and Permits
10.3	Resource Recovery and Protection Plan
10.4	Noise and Vibration Studies
10.5	Cultural and Historical Resource Surveys
10.6	Fish and Wildlife Information
10.7	Soil Resource Data and Analysis
10.8	Geology and Hydrology Data
10.9	USDA Important Farmlands of La Plata County, Colorado
10.10	Structure Designs
10.11	Hydrological Analysis – Stoner Engineering & Surveying, Ryan Griglak, P.E.
10.12	B.L.M. Environmental Assessment: EA DOI-BLM-CO-S010-2014-0025
10.13	Public Liability Insurance Document
10.14	Certifications

## **APPENDIX 10.1 - RIGHT OF ENTRY INFORMATION**

**APPENDIX 10.2 – LICENSES, APPROVALS, AND PERMITS**

**APPENDIX 10.3 – R2P2 PLAN**

**APPENDIX 10.4 – NOISE AND VIBRATION STUDIES**

## **APPENDIX 10.5 – CULTURAL RESOURCE STUDIES**

**APPENDIX 10.6 – WILDLIFE STUDIES**

**APPENDIX 10.7 – SOIL RESOURCE DATA AND ANALYSIS**

## **APPENDIX 8 – GEOLOGY AND HYDROLOGY DATA**

**APPENDIX 9 – USDA IMPORTANT FARMLANDS OF LA PLATA COUNTY, COLORADO**

## **APPENDIX 10 – STRUCTURE DESIGNS**

## **APPENDIX 11 – SURFACE HYDROLOGY ANALYSIS**

**APPENDIX 12 – BLM ENVIRONMENTAL ASSESSMENT  
EA DOI-BLM-CO-S010-2014-0025**

## **APPENDIX 13 – PUBLIC LIABILITY INSURANCE DOCUMENTS**

## **APPENDIX 14 – CERTIFICATIONS**