

COMPATIBILITYASSESSMENTAND MITIGATION

GCC is committed to safe mining operations, to environmental protection, and to its longstanding relationship with La Plata County. As a company, GCC strives to be a good neighbor, and to operate at the highest levels of safety and integrity. For these reasons, GCC has worked cooperatively with the County to review compatibility of its existing facility and to address issues raised through public comment throughout this process.

GCC voluntarily agreed to submit an application for a Class II Land Use Permit to the County in 2011, despite having commenced operations of the mine in July 2007 in reliance on the County's written representation that no County permit was required. The County has now changed its position and seeks to regulate the land use aspects of the facility, despite the fact that numerous federal, state and local authorities already exercise extensive regulatory authority. These agencies include the Bureau of Land Management; the Colorado Division of Reclamation, Mining and Safety; the U.S. Office of Surface Mining, Regulation and Enforcement; the Colorado Department of Public Health and Environment; the United States Environmental Protection Agency; the San Juan Basin Health Department; the Colorado State Board of Land Commissioners; the Office of the State Engineer, the Colorado Division of Water Resources; the Colorado State Historic Preservation Office; and the Mine Safety and Health Administration. GCC is undertaking this permit process in good faith, but is not conceding that the County indeed has jurisdiction and is not waiving any legal rights to claim otherwise in the future.

I. Mitigation Measures as a Result of the Hay Gulch Citizen Advisory Panel

To address compatibility concerns raised during the Class II Permit process, GCC convened a panel made up of concerned citizens from the neighboring area. The panel, which adopted the name Hay Gulch Citizen Advisory Panel ("HGCAP"), represented three distinct constituencies with some common and some conflicting concerns and expectations. One constituent group represented residents along County Road 120, north of the King II project. A second group was made up of residents of the Vista de Oro subdivision, which lies to the west of the project. The third group was made up of residents of County Roads 120, 119 and 116 south of the project. The HGCAP members were selected by their own constituents to act as community representatives.

The HGCAP met with GCC several times beginning in March, 2015, and also held a number of meetings that did not include GCC representatives. Several meetings were held with smaller groups of HGCAP members to explore issues that either had unique impacts on specific parts of the community, or issues in which some members had unique expertise.

On July 8, 2015 the HGCAP provided a set of recommendations to the County in a document titled "Recommendations for Approval of Class II Land Use Permit – GCC Energy/King II Coal Mine." The recommendations focused primarily on coal truck traffic and associated dust and noise, water quality, and vibration or noise caused by mining operations. There were twenty-one recommendations made; however, HGCAP representatives of CR 120 north went on record opposing the general HGCAP recommendation that the north end of CR 120 be the principal coal haul route. In a separate recommendation to the County, a group of residents representing CR 120 north favored a loop route for coal haul traffic on CR 119, CR 116 and CR 120. The CR

120 north submittal also rejected the idea of a dedicated private haul route traversing State Land Board and private properties that had been explored for feasibility.

Of the twenty-one HGCAP recommendations, over half have been adopted by GCC or will be adopted following successful Class II Permit completion. Others were outside the scope of this Class II Permit application, and a few were deemed not feasible. GCC appreciates the countless hours of volunteer time dedicated by the citizen members of HGCAP and the productive discourse regarding possible methods of mitigation.

II. GCC's Conformance with the Code Standards for Compatible Development

Section 82-193(c)(2)(a) through (f) of the La Plata County Code outlines various standards of compatible development. The below summary walks through each of these criteria and explains why the facility meets the criteria and what additional mitigation measures GCC has undertaken and is in the process of instituting to further address County requests or citizen concerns.

A. Traffic Compatibility- Section 82-193(c) (2)(a) – The mitigation measures described below will ensure that traffic generated by the facility will not create safety hazards, create traffic which is beyond the capacity of affected roads, result in substantial increases over existing traffic volume, or result in the reduction of existing service levels.

A complete analysis of the traffic impacts of the operation is attached in a Traffic Impact Assessment dated July 31, 2015 from Mike Olson, PE. The study provided an in-depth analysis of the current and projected traffic generated by the King II mine project, examined existing conditions and recommended a time table for improvements to County Road 120.

As a result of these conclusions, and in addition to these conclusions, GCC has taken and agrees to take the following additional measures to limit any off-site impact due to traffic:

- i. GCC will pave and improve CR 120. GCC will pave certain gravel portions of CR 120 beginning in 2015 with the widening of the 90-degree corner at mile marker 0.3 and continuing in 2016-17 with the paving of all gravel portions of CR 120. The first scheduled paving of the gravel portions of CR 120 will be adjacent to residences near the end of the existing pavement. The proposed schedule of paving and road improvements is detailed in the updated GCC Energy King II Coal Mine Traffic Impact Assessment dated July 31, 2015 ("Traffic Impact Analysis"). In addition, GCC plans to work with the County to apply for and obtain Energy Impact Grants funded by the Colorado mineral severance tax to assist in funding further road improvements.
- ii. GCC will also extend culverts for the Big Stick irrigation ditch, and widen pavement at the curve and repaint centerlines on CR 120 at mile marker 0.3 from SH 140 to provide for better lane usage by haul trucks. This project was initiated in the spring of 2015, was halted when the Big Stick ditch came on call and will be completed after the irrigation season.

- iii. Vegetation will be cleared along CR 120 in certain locations for purposes of improving sight distances for vehicles traveling along road.
- iv. GCC has a written policy which imposes speed limitations on all haul trucks on CR 120. Under this policy, trucks shall not travel faster than 25 mph on gravel sections of CR 120, shall reduce speed to 10 mph while passing residences on the gravel portions of CR 120, shall abide by advisory speed signs, and shall travel no faster than 5 mph below posted speed limits on paved sections.
- v. GCC shall monitor these speed limits by: a) purchasing radar guns; b) monitoring speeds on CR 120 and CR 140 at unannounced times; c) requiring truck numbers to be posted on the rear of trailers for easy identification; and d) conduct quarterly in-person trainings with all drivers to discuss safety precautions and speed limit restrictions. Training on speed limit restriction shall focus on safety and acceptable speeds on specific portions of CR 120, consistent with GCC's written policy. GCC maintains a detailed log of trucks loaded at the King II mine, and maintains a record of incidents of excessive speed, excessive truck noise, and unsafe driving. The record is not limited to coal trucks, but includes vendor delivery trucks and employee vehicles
- vi. GCC will establish a direct dial phone number which can be used to report safety concerns or violations.
- vii. GCC will significantly reduce the number of trucks traveling along CR 120 on the weekends. In response to County and neighbor requests, there will be no coal hauling traffic on Sundays and decreased hauling on Saturdays, except in unusual circumstances. Sunday trucking has been suspended since March, 2015.
- viii. To prevent road congestion on snow days, GCC often calls off coal haul trucks or limits the number of trucks that will be loaded. GCC has a policy against chaining and unchaining in CR 120 traffic lanes except in cases of emergency.
- ix. Haul trucks are not allowed to tarp or untarp in CR 120 traffic lanes. Sufficient parking space is provided at the mine site for tarping and untarping.

B. Noise, Dust and Vibration Compatibility – Section 82-193(c) (2)(b) - Neither noise, nor dust, nor vibration from the facility or its traffic will disturb neighbors to the facility or to CR 120.

A noise study in 2013 concluded that noise produced at the mine site is below the 55db(A) daytime and 50db(A) nighttime standards set forth in C.R.S. § 25-12-103 when measured at adjacent properties. Section 25-12-103 of the C.R.S. establishes further limitations for "Periodic,

impulsive or shrill noises... Examples include back-up alarms and warning devices.” When corrected for wind or background noise, neighboring residences tested from 35db – 37db. The single point at a property boundary that intermittently tested above 55db(A) was at the driveway entrance to the property when a truck entered or exited. This 2013 noise study is incorporated into the broader environmental study conducted by CDS Environmental, Final Report – Analytical Activities in Response to Neighbor Comments dated May 8, 2014 (“Analytical Activities Study”).

The Analytical Activities Study 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 will not transmit beyond the immediate vicinity.

In response to citizen requests, the Analytical Activities 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.

Additionally, a supplemental vibration study was performed in December 2014 to address adjacent landowner concerns that measurements in the original Analytical Activities Study were made too far from production activity and covered too short a time span. This supplemental study by CDS Environmental is titled GCC Energy – King II Mine UNDERGROUND MINER GROUND MOTION STUDY dated December 11-31, 2014. Measurements in the supplemental study were made 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. The report 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.

Despite the conclusions of the Analytical Activities Study and the supplemental vibration study that noise levels are below State standards, in response to County and citizen requests, GCC has taken and continues to pursue the following additional measures to reduce noise and vibration both at the facility and from haul truck traffic:

- i. Noise and vibration generated by the facility related to nearby residents.
 - a. GCC limits operation of the coal crushing and screening facility to daylight hours. Coal crushing and screening on the surface is normally limited to 6-10 hours per day.
 - b. The largest source of noise generated at the facility is the ventilation fan at the mine portal. Although the 2013 noise study did not detect fan noise at nearby residences, it was reported anecdotally that under particular atmospheric and wind conditions some mine noise could be detected as much as a few miles distant.

GCC followed up on the reports and was able to attribute the noise to the main ventilation fan. In response to these observations, GCC installed noise-reduction equipment on this fan in April, 2015 and will install similar, or newer technology noise-reduction equipment on other large fans that may be used at the mine in the future.

- c. GCC learned that noise from surface equipment startup alarms and backup alarms at the mine site could be heard at neighboring residences. Several subsequent actions were undertaken to eliminate or reduce alarm noise. Two alarms that emitted a loud two-tone chirp several hundred times daily were eliminated entirely. Alarms required for safety or by law were replaced or modified so as not to project sound beyond the site boundaries. Finally, all alarm sounds were reduced to the minimum level required to meet safety and legal standards.
 - d. As a follow-up to the above effort described at subsection (c), GCC modified facility load-out procedures to reduce activation of truck backup alarms during the loading process.
 - e. GCC has and will continue to solicit observations from neighbors to assist in identifying noise that has not otherwise been addressed.
- ii. Noise and vibration from truck traffic
- a. Section 25-12-107, C.R.S., establishes a maximum noise level of 86db(A) for speed limits of 35 mph or less and 90db(A) for speed limits over 35 mph, as measured 50 feet from the center of the traffic lane for vehicles over 6,000 pounds. Periodic monitoring will be done by trained GCC personnel using industry standard noise dosimeters calibrated to industry standards.
 - b. Initial measurements provide the following data: (1) at the intersection of CR 120 and CO 140, background noise was measured at 60.9db, while the loudest truck noise was 74.9db; (2) at mile point 0.3 on CR 120, background noise level was 61.4db, while the loudest level for a single truck was 77db and for three trucks traveling together was 78db, a diesel pickup with stock trailer was measured at 83.4db; and (3) at mile point 1.8 on CR 120 (halfway up the big hill), background noise level was 69.1db (with wind), most trucks climbing the grade were measured at 83db, while several trucks with inadequate mufflers were measured at 86db-88db.

- c. Despite these measured levels falling below State noise level standards, GCC has taken the following additional steps to mitigate coal haul truck noise:
- (i) GCC requires trucks to have effective mufflers. GCC has begun to test noise on trucks that are new to the fleet, and will make follow up tests if observations warrant. Exhaust systems have been replaced on a number of trucks, and other trucks have been taken off the coal haul as a result of this effort.
 - (ii) GCC has a long-established written policy which prohibits coal trucks on CR 120 from using “jake brakes” from SH 140 slow-down to the mine site. The policy is communicated at initial new-driver training, annually at refresher training intervals, and also quarterly at face-to-face company-wide driver training sessions.
 - (iii) Truck speeds on CR 120 have been reduced to decrease noise, especially near residences. Speeds are monitored to ensure compliance (see Sections A.iv. and A.v., above for additional information).
 - (iv) GCC has worked with trucking contractors to identify and address sources of trailer noise, such as the rattling of tarp winders or fender skirts, which is most notable on unpaved sections of CR 120. Once paved, these sounds will be further mitigated.

Dust from the facility or its traffic will not disturb neighbors to the facility or to CR 120. On-site traffic dust is suppressed by very low traffic speeds and the application of magnesium chloride and water. Dust from the production of coal is suppressed with water sprays while the coal is being mined. Water spray configuration, including nozzle type, orifice size, number of spray nozzles required and minimum spray pressure are strictly regulated by the Mine Safety and Health Administration (“MSHA”).

Dust generated by surface coal handling activities is suppressed or contained by the design of processing equipment. Specifically, conveyors and transfer points are enclosed, screening and crushing equipment is enclosed, coal stockpile conveyors discharge through stacking tubes rather than into open air, and coal is loaded into trucks with equipment designed to emit little fugitive dust.

To further address County requests and citizen concerns, off-site traffic dust will be mitigated by the following additional actions:

- iii. GCC will water CR 120 on an as-needed basis for purposes of dust suppression.

- iv. GCC will pave and improve CR 120. GCC will pave certain gravel portions of CR 120 beginning in 2015 with the widening of the 90-degree corner at mile marker 0.3 and continuing in 2016-17 with the paving of all gravel portions of CR 120. The first scheduled paving of the gravel portions of CR 120 will be adjacent to residences near the end of the existing pavement. The proposed schedule of paving and road improvements is detailed in the updated GCC Energy King II Coal Mine Traffic Impact Assessment dated July 31, 2015 (“Traffic Impact Analysis”).
- v. Reduction of truck speeds as discussed in Section A.iv. above further reduces generation of dust.
- vi. GCC requires coal trucks cover loads during transport to eliminate dust blowing from trailers.
- vii. Coal spills are cleaned up immediately to reduce the amount of coal dust that might be generated by traffic.

Subsidence is not a compatibility standard in Section 82-193(c)(2) of the County Code, rather it is regulated by the federal or state authority granting the mining permit, either CDRMS or OSMRE depending upon jurisdiction. That said, as the HGCAP discussed subsidence, this Compatibility Assessment also touches on it. CDRMS Regulation 2.03.7(3), Relationship to Areas Designated Unsuitable for Mining, states: “If an applicant proposes to conduct surface mining activities or conduct or locate surface operations or facilities within 300 feet measured horizontally of an occupied dwelling, the application shall contain the written waiver of the owner of the dwelling which states that the owner and signator had the legal right to deny mining and knowingly waived that right. The waiver must be knowingly made and separate from a lease or deed unless the lease or deed contains an explicit waiver.” In addition to restricting mining to not within 300 feet of an occupied dwelling, CDRMS typically requires that “angle-of-draw” be considered in determining a distance where mining is not permitted. Angle-of-draw accounts for the possibility that the effects of subsidence may extend beyond the actual extent of mining, typically figured at a 35-45 degree angle extended to the surface. GCC currently complies with all CDRMS Regulations. There are two occupied dwellings within a 650-foot radius. Any time subsidence may affect a structure, a mitigation and monitoring plan must be put in place.

C. View Compatibility - Section 82-193(c) (2)(c) - The facility will not create adverse or unsightly views for neighbors or the travelling public.

The facility is located approximately 1,000 feet up a drainage off of Hay Gulch and is barely visible from CR 120 and not visible from adjacent properties. During site development, extraordinary efforts were made to preserve existing landscape and tree cover, and minimize footprint and surface disturbance. For example, the initial conceptual design called for a mine portal bench cut into the hillside that would cover nearly 4 acres and expose a 100-foot highwall. The final design was decreased and the portal bench covers 1.8 acres and exposes a 30-foot highwall. The facility is not anticipated, therefore, to cause adverse or unsightly views.

Further, the HGCAP did not identify views as a particular concern or make a recommendation regarding views.

D. Water Compatibility - Section 82-193(c) (2)(d) – The facility operations will not result in pollution of ground or surface waters and will have no impact on neighbors of the facility.

The water table in the area is below the coal seam. Therefore, no water is encountered in the mining operation. A recent memorandum by Steven W. Korte, Consulting Geologist, summarizes absence of water encountered in GCC exploration drilling programs where he had been the principal geologist. The coal seam lies at a depth of 280-310 feet depending on topography. The 1998 exploration drill holes that defined the project were completed at least 20-40 feet below the coal seam. Sixteen of the drill holes were drilled to a depth of 400-450 feet, with one extending to a depth of 489 feet to detect possible deeper-lying coal seams. The Korte memorandum notes that “No additional coal seams OR water were encountered in these deeper drill holes.” [Ref: “Steven W. Korte Memorandum” July 29, 2015] This observation is corroborated by electronic log data of core drill holes. Since beginning operation in 2007, the mine has not encountered water bearing zones.

The “King I & King II Annual Hydrology Report 2015 01 07” provides water monitoring data from 2007 to the present. A review by Dr. Joe Bowden of CDS Environmental is attached to the hydrology report and establishes how the data demonstrate that mine operations have not contributed to water pollution.

To establish a better baseline for ground water quality and to ensure that the King II mine is not adversely affecting the water wells of adjacent landowners, GCC Energy is planning to install 3 to 5 monitoring well clusters. (See “Preliminary Hydrologic Monitoring Plan King II Coal Mine” by Resource Hydrologic Services). Each monitoring well cluster will include one well completed above the Menefee Formation “A” Coal seam, one well completed in the “A” Coal Seam, and one well completed in the lower Menefee Formation below the “A” Coal seam where ground water is encountered. These clusters will be located up-gradient and down-gradient of the King II mine. They will be used to meet the baseline and monitoring data requirements for La Plata County, the Colorado Division of Reclamation Mining and Safety (CDRMS), and the Federal Office of Surface Mining and Enforcement (OSM) related to groundwater quality and hydrologic balance. Data from these monitoring wells will also be used to support updates to the Cumulative Hydrologic Impact Assessment (CHIA) and Probable Hydrologic Consequences (PHC) for the King II Mine Plan.

The final location, arrangement, and installation of the proposed monitoring well clusters, as well as the sampling analyte list, will depend on additional guidance from CDRMS and OSM. The Plan provides substantial detail for sampling and analysis that will not change regardless of number and type of wells. GCC expects that this guidance will be available by August 30, 2015 and that the wells will be installed by the end of 2016. DRMS and OSM will be responsible for

monitoring and enforcing data collection and reporting from these proposed monitoring well clusters as part of their Mine Plan enforcement duties agency.

In addition to the above measures:

1. A study completed in 2013 examined water quality of seven residential water wells within a 10,000-foot radius of the project to determine impacts attributable to mining operations. In cases where it was not possible to draw water directly from the well, samples were drawn from a point in the system nearest the well. If water passed through a cistern, water was run until pH, temperature and conductivity had stabilized. Samples were drawn and analyzed by qualified experts using standard practices and accredited laboratories. Well water data was reviewed in conjunction with known geologic and stratigraphic data of the region and Division of Water Resources public data. Review of well completion reports, and review of analytical data indicated that most wells were completed in multiple water bearing zones. The absence of water encountered during mining, the accounting for water consumed in the mining process, and the lack of a consistent transport mechanism led to the conclusion that mining activities did not contribute to well water contamination. It is further noted that many of the water bearing zones in the region are in coal seams below the King II mine and as such many wells have been completed in deeper coal seams or pass through deeper coal seams.
2. A mine water consumption balance study was completed in 2014 and provides clear accounting of water use during the mining process. It concludes that no appreciable process water remains unaccounted for. An executive summary was added in 2015 to clarify the report conclusions. [Refer to “Water Balance Study for the King II Mine” Executive Summary Added July 20, 2015]
3. Availability/Impact of Water for facility Analysis – the project will have adequate water sources to operate and will have no impact on domestic water supplies in the area.
 - i. The water right in Water court Decree No. 07cw100 will provide raw water for mine operations and for treatment to provide potable water for offices and sanitary facilities. The Decree provides up to 34.07 acre feet per year from three sources of water: Huntington irrigation dry-up, diversion from the La Plata River, and well water. An agreement has been reached for a redundant water source made up of additional Huntington Class A Shares, and an alternate storage reservoir to replace an underground reservoir which is not expected to be used [“Huntington Letter of Intent” July 31,2015]. Preliminary investigation into the reservoir’s location has been initiated and will be surveyed in the first week of September or before. A complete description of the water supply, storage, and steps to implementation in a report by Harris Water Engineering [“King II Mine Redundant Water Sources” July 30, 2015]

- ii. As discussed above, the mine is above the water table, therefore does not deplete aquifers as a result of mine development. Water which may be obtained from water wells and used in the mining process is subject to an augmentation plan set forth in Decree 07CW100 dated December 31, 2007.

E. Character Compatibility - Section 82-193(c) (2)(e) - The facility will not adversely change the character of the neighborhood.

Hay Gulch and its surroundings have historically been ranching and coal mining areas. Many area ranches date into the late 1800's, and mining operations have existed in the area since approximately 1900. At least sixteen coal mines exist in the Hay Gulch and Hesperus area and are depicted on the "King II Mine – Lease Map". Mining at the King I mine began in 1938, and continued in 1941 with the first federal coal lease occurring on land underlying Huntington Ranch. La Plata County itself has a long history of mining: the Horse Gulch area east of Durango, Coal Gulch area just west of Durango along Highway 160 and La Plata Canyon north of Hesperus to name a few. Most of the early residential development in the area was associated with the agricultural families in the area and sparsely located along roadways and arable land. It has only been in the last 20-30 years that residences began being built in any appreciable density on the dry upland areas of the Hay Gulch area. While it is true that the GCC mine has produced more road traffic, GCC's agreement as a mitigation measure to pave the gravel portions of CR 120 will elevate the rural character of the current county road commensurate with the residential and mine development. Notwithstanding, in response to County requests and citizen input, GCC has taken and is in the process of instituting a number of additional measures, as discussed herein, to mitigate impacts of the facility on nearby residential and agricultural uses.

Additionally GCC will continue to support and work closely with the HGCAP and directly with neighbors and will continue to fund an independent facilitator as necessary to lead the HGCAP meetings. Through its work with the HGCAP, GCC will continue to consider reasonable measures to further mitigate unanticipated impacts from the facility.

F. Privacy Compatibility - Section 82-193(c) (2)(f) - The facility will not significantly disturb the privacy of neighbors.

As previously stated, the facility is located approximately 1,000 feet up a drainage to Hay Gulch and is not visible from adjacent properties. The facility is not anticipated, therefore, to disturb neighbors' privacy. Additionally, GCC has and will institute the mitigation measures outlined in this Compatibility Assessment for noise, vibration, dust and traffic, which are anticipated to further preserve the privacy of neighbors to the facility and to CR 120.

III. Conclusion

In closing, as evidenced by this Compatibility Assessment and Mitigation, GCC has commissioned various studies to understand whether its use has any impact on surrounding properties. These studies confirmed that the facility is complying with federal and state laws and

regulations and, often, found that there was no impact by the facility on its neighbors. Nonetheless, GCC has worked cooperatively with the County, HGCAP and neighbors to institute a number of additional mitigation measures to further ensure that its use is compatible. GCC is committed to safe mining operations, environmental protection, and its longstanding relationship with La Plata County. GCC looks forward to continued dialogue with the County and neighbors as it strives to be a good community corporate citizen.