0034

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor

Ted Stewart
Executive Director

James W. Carter
Division Director

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340
801-359-3940 (Fax)
801-538-5319 (TDD)

July 13, 1994

George Morris, Forest Supervisor
U.S. Forest Service
Manti-LaSal National Forest
599 West Price River Road
Price, Utah 84501

Re: Updated Information, FS and Division Concerns, Lease by Application, Crandall Canyon Mine, Genwal Coal Company, ACT/015/032-93-1, Folder #2, Emery County, Utah

Dear Mr. Morris:

Enclosed please find two copies of updated information for the LBA for the Crandall Canyon Mine which was submitted as a result of a meeting on June 22, 1994 between Genwal Coal Company and the Forest Service and a Division deficiency letter. I have also attached the cover letter to explain all of the changes.

If you have any questions, please call me.

Sincerely,

Pamela Grubaugh-Littig
Permit Supervisor

Enclosure

GENWAL COAL COMPANY

July 8, 1994

Mr. Daron Haddock
Division of Oil, Gas & Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, UT 84180-1203

ACT/015/032 #2
Copy PAM

RE: Permit #ACT 015-032 LBA Amendment
Genwal Coal Company
USFS concerns on the LBA Amendment
Responses to the review of Chapter 1 and Chapter 3 by DOGM

Dear Mr. Haddock:

On Wednesday, June 22, 1994, Jay Marshall and myself had a meeting with Mr. Dale Harbor of the U.S. Forest Service, Price Office, Manti La Sal Forest. Mr Harbor had several concerns in regard to the LBA Amendment. It was decided that those concerns would be addressed by Genwal Coal Company and incorporated into the LBA Amendment, Crandall Canyon Mine mine and reclamation plan.

In this same submittal, Genwal Coal Company has also addressed those concerns listed by Mr. Paul Baker in a letter to Mr. Daron Haddock on June 29, 1994.

Please find fourteen (14) copies of the following:

1. A revised Chapter 1 which includes including Genwal as a land owner, the Employee I.D. numbers for those companies listed in the chapter, the deletion of the reference to the underground special use permit, and the completion of the sentence found at the bottom of page 1-14.

2. A copy of the newspaper advertisement which needs to be placed in Appendix 3-8.

3. A revised Chapter 3 which includes:
   DOGM review: A statement incorporated into Section 3.22 speaking of the negative findings of any goshawks and referencing the Environmental Assessment of Lease UTU-68082.
   USFS review: As highlighted throughout the chapter.

4. A copy of the Wildlife Resources letter on cliff-nesting raptors by Mr Larry B. Dalton of the Utah Division of Wildlife Resources, to be included into Appendix 3-8.

P.O. Box 1420 • Huntington, Utah 84528 • Telephone (801) 687-9813 • FAX (801) 687-9784

5. A revised page 4-1 and 4-3 with changes reflected in bold lettering.

6. A revised page 5-17, 5-24, and 5-24A with changes reflected in bold lettering.
   A revised page 5-48 with changes showing the correct bond as listed in Appendix 5-20.

7. A revised Figure 5-8, Structure Map, page 5-21, changed to reflect the location of the Joes Valley Fault.

8. A revised page 7-17, 7-18, 7-19, 7-20 through 7-22, 7-25, 7-28, 7-32, 7-37,7-38, 7-48 through 7-50, and 7-57 with changes shown in shaded verbiage.

If you should have any questions or need additional information, please contact me at 687-9813.

Sincerely,

GENWAL COAL COMPANY
Larry W. Johnson
Engineer

10,480 feet	Sec. 35T,15S,R6E, SE	North Horn
10,240 feet	Sec. 35T,15S,R6E, NW	North Horn - base
9,280 feet	Sec. 31T,15S,R7E, SW	Price River
9,680 feet	Sec. 25T,15S,R6E,S 1/2	Castlegate

Seeps and springs northwest of the permit area discharge from the North Horn Formation or alluvium covering the North Horn Formation in Little Joe's Valley. In contrast to other seeps and springs in the study area, flows from many of these water sources increased substantially between the spring/early summer surveys and the fall surveys (Appendix 7-17). This anomalous water flow trend is attributed to three factors. First, recharge from the Joe's Valley Fault Zone. These water sources lie in a linear trend parallel to the fault zone, directly along or west of Indian Creek which also follows the trace of the fault zone. Secondly, recharge from water in the colluvium and alluvium on the west-facing slope of East Mountain flows downhill toward Little Joe's Valley and discharges into the valley alluvium. The relatively late arrival of this water is due to the lag time as this snow melt-derived water travels through the soil to the valley floor. Thirdly, these seeps and springs in Little Joe's Valley lie in a different drainage basin than those in the rest of the study area, a drainage basin which has a contrasting flow pattern to that present in the Huntington Creek tributaries on the east-facing slopes of East Mountain.

According to Genwal personnel, current mine plans for the LBA No. 9 area (which is bounded at the east margin of the LBA by the north and south trending Joes Valley Fault Zone) indicate that mining will not occur within approximately 1000 feet of the fault zone. Therefore, Genwal does not anticipate their mining operations will either encounter or dewater the Joes Valley Fault.

During the period of March and April 1987, a monitoring well (MW-1) was installed at the Crandall Canyon Mine in the location indicated in Plate 7-13. This well currently supplements Crandall Creek with water for in-mine process water at a rate of less than 1 gpm. MW-1 was drilled using air-rotary methods to a total depth of 375 feet, and encountered Star Point Sandstone through its entire depth (Figure 7-1).

The driller indicated that the formation was relatively homogenous except in the zone from 290 to 335 feet, where the sandstone became coarser. It is from this zone that the well is producing water, with water first being encountered at a depth of about 315 feet. The static water level approximately one week after completion of the well was at a depth of 186.1 feet below ground surface, indicating the presence of a significant upward pressure component (approximately 130 feet) within the saturated zone.

After completion of the well, a slug test was performed on the well to determine the approximate hydraulic characteristics of the Star Point Sandstone at the mine site. This test was performed by inserting approximately 10 feet of drill stem below the water surface and allowing the water level to stabilize over a period of 3.75 hours. Although water level recovery was measured during this

None of the springs have been improved for human consumption. However, flowing surface water within each watershed does contribute to downstream water users such as industry, domestic water supplies, and recreation (i.e., cold water fisheries). As would be expected, wildlife usage of the springs is most abundant where flows are greatest and the source is most accessible.

Data indicates that the specific conductance of water issuing from springs in June generally increased with increasing stratigraphic depth. This is in agreement with the findings of Danielson et al, (1981). Springs issuing from the Price River Formation typically had a specific conductance during the June survey that varied from 150 to 450 umhos/cm at 25°C while those issuing from the Blackhawk Formation and Star Point Sandstone had a specific conductance varying from 500 to 1000 umhos/cm at 25°C. This increase in specific conductance is indicative of leaching of minerals by the groundwater as it flows through increasing distances of bedrock to the lower stratigraphic positions.

The pH of water issuing from springs in the survey area showed no trends within or between formations. Values varied from 6.80 to 8.57, averaging 7.74. Hence, spring water in the study area is slightly alkaline.

In those springs with sufficient water to sample, pH generally increased slightly between June and October. Increases normally amounted to 0.1 to 0.5 pH unit. Specific conductance showed no consistent pattern between the June and October data, with approximately as many increases as decreases between June and October.

Water temperatures vary widely at the site. In general, temperatures are lowest in springs issuing from fractures and highest in springs issuing from shallow colluvium over bedrock. Low temperatures generally occurred in springs with relatively low specific conductances.

Appendix 7-42 contains water quality results for selected springs from 1988 through 1991. These water quality analyses generally have included at a minimum pH, temperature, conductivity or TDS, total manganese (as Mn), and either total or dissolved iron (as Fe).

Groundwater Development and Mine Dewatering

Water Supply

As noted previously, a few of the seeps or springs inventoried during the spring/seep surveys have been developed for beneficial use. This development does not include springs issuing from the Star Point Sandstone. No water wells used for consumption by humans or animals, other than MW-1, are known to exist within the study area of the spring inventory. However, as noted above there are downstream water users. Hence, only minor groundwater development has occurred in the past within the mine plan or adjacent areas.

2) headcutting erosion is calculated on rills (A, B, C, and D) (Plate 7-9), all ephemeral drainages,

3) headcutting is calculated for drainage "E" (Appendix 7-9), a drainage reach that also exhibits ephemeral flow, and

4) erosion is calculated at the eastern edge of Section 36 (stations 14.5 through 19) (Plate 7-9), over an area where a barrier pillar exists and erosion is extremely unlikely. Drainage erosion between stations 14.5 and 19 is extremely unlikely given the absence of a nick-point produced by retreat-mining (downward hydraulic jump), from which erosion can advance from in an upstream direction resulting in erosion. The more likely occurrence is for all but the smallest sizes of suspended sediment (colloidal) to be deposited upstream of station 14.5, and not reach Manti-La Sal Forest Service land further downstream.

The Manti-La Sal National Forest Service desires an equal or greater amount of sediment to be trapped elsewhere in the Manti-La Sal National Forest to offset potential increases of sedimentation on Forest Service land that could result from retreat-mining of State Section 36. As discussed with the U.S.F.S. Research Station personnel, and officials of the Manti-La Sal National Forest Service, erosion control measures cannot be implemented within the Blind Canyon drainage, on the State of Utah or Manti-La Sal National Forest Service lands, due to potential impacts on the U.S.F.S. Intermountain Research Station's study. Consultations with Manti-La Sal National Forest Service personnel have resulted in identification of a site, Nuck Woodward Canyon where an erosion enhancement procedure can be conducted to reduce an equal or greater amount of sediment entering the Huntington Creek. The enhancement procedure consists of graveling approximately 1/2 mile of the U.S.F.S road from the intersection of Route 31 to the trailhead area of the Nuck Woodward Canyon. An agreement whereby Genwal donates $15,000 to the Manti-La Sal Forest to fund the Forest Service graveling of this road appears in Appendix 7-49. This mutually agreed upon action by Genwal Coal Company and the Manti-La Sal National Forest, satisfies the U.S.F.S.'s "Net Beneficial Impact Policy." Additionally, Genwal commits to remediating any adverse effects of retreat mining.

Thin-section microscopy and x-ray diffraction analyses of shales obtained from Crandall Canyon Mine overburden reveal the presence of a variety of bentonitic (swelling) clays. Moreover, carbonate cementation characteristics observed in thin-section and at outcrops, as well as groundwater analytical results, suggest pore-fluid chemistry conditions promote sealing of subsidence fractures (Appendix 7-41). This appendix also references a U.S. Forest Service study which indicates physical closure of subsidence

describe variations in flows and quality during the year and will include tables, graphs, hydrographs, etc. as appropriate. A copy of these data will also be submitted to the Forest Service on an annual basis.

Due to the close proximity of the sedimentation pond to Crandall Creek, the piezometer installed in the dam (see Plate 7-4) will be measured on a quarterly basis and the embankment will be visually monitored on a weekly basis to reduce the likelihood of an undetected potential dam failure.

Water-level measurements will be collected from the piezometer immediately prior to and following full-scale clean out of the sedimentation pond. If the pre- and post-cleaning water levels vary by less than 0.5 foot, monitoring following clean out will occur on a weekly basis for a period of one month. If significant changes are not noted during this one-month period (as determined in consultation with DOGM), the monitoring frequency will return to a quarterly interval. If significant water-level changes are noted during the post-clean out weekly monitoring period or if there is other evidence to indicate that the embankment is rapidly saturating, Genwal will notify DOGM within a 14-day period of the water-level changes and will mutually agree upon additional monitoring requirements.

The slope-stability analysis presented in Appendix 7-6 assumed that the water level at the location of the piezometer (Section B-B') was at an elevation of 7764 feet (20 feet below the surface of the embankment at the piezometer). Under these conditions, the dam was shown to be stable. If the water level in the piezometer rises above this elevation, water will be immediately withdrawn from the pond. If available data (testing within 24 hours of proposed discharge) indicate that the water in the pond meets the effluent limitations contained in R614-301-751 and any applicable NPDES permits, this water will be pumped directly to Crandall Creek. Any direct discharges will be monitored at the beginning and end of pumping from the pond. The pump inlet will be placed on a floating spring to avoid pulling excess sediment into the discharge table during pumping. Water will be pumped from below the water surface to avoid introduction of oil to the discharge water.

If the pond requires rapid dewatering and the quality of the water is such that it cannot be discharged directly to Crandall Creek, the water will be pumped into sumps contained in the underground workings. These sumps are constructed large enough to provide for storage of the surface water. Once the water in the underground sumps is of sufficient quality (i.e., when the suspended solids have settled) to meet the effluent limitations of any applicable NPDES permits, the water will be discharged to Crandall Creek.

During the post-operational period, surface-water data will be collected from the upper and lower stations shown in Plate 7-7 and the inflow to the sedimentation pond as indicated on Plate 5-16. Flow data will be collected continuously from the flumes at the upper and lower Crandall Creek stations and twice annually (during

difficulty of removing these boulders from the outslope, this slope will remain unreclaimed.

The effectiveness of the reclamation activities was modeled using SEDIMOT II. Results of these calculations are contained in Appendix 7-9. According to this appendix, the peak effluent suspended sediment concentration from SAE-3 during the 10-year, 24-hour storm is 2 milligrams per liter. This concentration is within the standards established by the R645 rules. During the 10 year operational history of the mine, there has not been a dam failure. The current life expectancy of the mine is an additional 15 years.

SAE-4 consists of a 0.14 acre area on the outslope (south side) of the U.S. Forest Service road between SAE-1 and SAE-3. Periodic grading and maintenance of the access road results in fresh soil occasionally being deposited on the outslope, limiting the potential for the outslopes to be contemporaneously reclaimed. Thus, because the area does not report to the sedimentation pond, alternate sediment control will be provided.

Sedimentation control in SAE-4 will be provided by installing a silt fence along the entire length of the toe of the road outslope. The silt fence will be installed in accordance with Figure 7-12. The silt fence will be periodically inspected and repaired as required to ensure that its integrity is maintained.

SAE-5, SAE-6, and SAE-7 consist of the topsoil stockpiles that are located on the south side of the access road east of the mine site in the areas indicated in Figure 7-12. Sae-6 and SAE-7 also include small gravel stockpiles used for maintenance of the access road. Disturbed areas associated with the topsoil/gravel small-area exemptions are 0.20 acre, 0.22 acre, and 0.62 acre for SAE-5, SAE-6, and SAE-7, respectively. All topsoil stockpiles are being protected from erosion by a combination of dikes, berms, and a vegetative cover.

Sedimentation control for SAE-5, SAE-6, and SAE-7 will be provided by installing straw-bale dikes around the perimeter of each disturbed area. These dikes will be installed in accordance with Figure 7-11. The dikes will be periodically inspected and repaired as required to ensure that their integrity is maintained.

SAE-8 consists of the Forest Service parking area west of the mine surface facilities (see Plate 7-16). This parking area was constructed by Genwal for the Forest Service during the latest surface expansion. Although it is not part of the surface facilities, it is a disturbed area within the permit boundaries. Sedimentation control will, therefore be provided. The disturbed area associated with SAE-8 is 0.17 acre.

Sedimentation control for SAE-8 will be provided by a silt fence installed in accordance with Figure 7-12 between the parking area and Crandall Creek. The silt fence will be periodically inspected and repaired as required to ensure that its integrity is maintained.