



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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801-538-5340

November 22, 1991

TO: Daron Haddock, Permit Supervisor

FROM: Randy Harden, Sr. Reclamation Engineer 

RE: **Proposed Mine Sequence Changes, Genwal Coal Company, Crandall Canyon Mine, ACT/015/032-91D, Emery County Utah.**

Summary:

*Dated 11/14/91
received*

On November 19, 1991, Genwal Coal Company submitted a proposal to update information in Chapter 14 of their mining and reclamation plan. These changes deal primarily with the reduction in the angle of draw for the area from 30 degrees to 21 degrees, and, the request to conduct second mining activities within the buffer zone area between the State leases and the Forest Service boundaries.

Analysis:

R614-301-521.140. Mine Maps and Permit Area Maps.

Under the requirements of R614-301-521.140. **Mine Maps and Permit Area Maps**, the operator must provide: The boundaries of all areas proposed to be affected over the estimated total life of the coal mining and reclamation operations, with a description of size, sequence and timing of the mining of subareas for which it is anticipated that additional permits will be sought; the coal mining and reclamation operations to be conducted, **the lands to be affected throughout the operation**, and any change in a facility or feature to be caused by the proposed operations; and, **the underground workings and the location and extent of areas in which planned-subsidence mining methods will be used and which includes all areas where the measures will be taken to prevent, control, or minimize subsidence and subsidence-related damage** (refer to R614-301-525).

Information found in the submittal clearly indicated that the underground sequence and the timing of the mining subareas had been substantially altered from the maps and designs submitted on June 21, 1991.

First mining, and more importantly, second mining of the first right panel of State lease ML-21569 should not have occurred without a more thorough determination of the influence due to subsidence in that panel. Obviously, the first right panel area should have been left unmined as indicated on Plate 14-1 of the June 21, 1991 submittal. Upon

acquisition of the federal lease area immediately to the west of the state lease, the operator could have efficiently second-mined the first right panel without having to contend with the problem of having the permit boundary adjacent to the first right panel. Failure to permit the area adjacent to the state lease prior to mining this first right panel appears to be a matter of poor judgement in mining sequencing and inadequate permit area planning by the operator.

Based on the information presented in the proposed changes to the mining and reclamation plan, insufficient information is present to allow second mining of the first right panel of State lease ML-21569. The operator must submit more detailed designs within that area to demonstrate that second mining could occur in that panel while minimizing or eliminating the effects of subsidence outside the permit area. Alternately, prior to conducting second mining operations of this panel, the operator could incorporate the potential area to be affected by the second mining of this panel into the permit area.

R614-301-622. Cross Sections, Maps and Plans.

The operator has not adequately characterized the geology of the state leases with regard to identification of other coal or rider seams that may be present within the lease area. At a minimum, the elevations and locations of test borings and core samplings; 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; all coal crop lines and the strike and dip of the coal to be mined within the proposed permit area must be provided in the plan.

No discussion of the rider seams within the state leases is found within the text of Chapter 14. The operator must discuss the location and the potential mineability of these other coal seams in the plan. Justification for not mining these seams needs to be presented in the plan. Such information as the interburden between the seams, their thickness, or coal quality may be considered as factors in determining whether or not the seams are considered mineable.

R614-301-522. Coal Recovery.

The permit application will include a description of the measures to be used to maximize the use and conservation of the coal resource. The description will assure that coal mining and reclamation operations are conducted so as to maximize the utilization and conservation of the coal, while utilizing the best technology currently available to maintain environmental integrity, so that re-affecting the land in the future through coal mining and reclamation operations is minimized.

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The operator needs to discuss the location, thickness and mining potential for the Bear Canyon and Blind Canyon seams as well as the Hiawatha seam. Additionally, any other identifiable rider seams above or below the Hiawatha seam which is currently proposed to be mined.

R614-301-523. Mining Method(s).

Each application will include a description of the mining operation proposed to be conducted during the life of the mine within the proposed permit area, including, at a minimum, 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.

Coal reserve information stated in the plan indicates that there is approximately 18 million tons of coal within the reserves of the state leases, of which 8 million tons are considered recoverable. This discussion needs to be expanded to consider those potential coal reserves in all of the coal seams which exist within the lease area. Annual production information also needs to be provided in the discussion of the mining operations. Sequence and timing of the mining operations must be more clearly established by the operator.

A mine map showing the location and extent of all existing mine workings within and adjacent to the permit area needs to be provided. This map should project the sequence and timing of those subareas to be mined within the permit term. These areas should be marked, at a minimum, to show the location and the extent of the areas to be mined on an annual basis. Upon submission of this mining projection and approval of the mining map by the division, the operator will be required to submit to the Division, as an amendment, any changes proposed to alter the mine design or sequence **PRIOR** to making such changes and changes in the underground mining sequence and operations must be approved by the Division prior to making such changes.

Any changes in the mining plans must also address any applicable changes that may be required in the subsidence control plan and must be approved by the division prior to implementing such changes.

R614-301-525.100. Subsidence Control Plan.

The subsidence control plan must clearly provide a description of the method of coal removal, extraction methods, including the size, sequence, and timing for the development of underground workings; a description of the physical conditions, such as

depth of cover, seam thickness, and lithology, which affect the likelihood or extent of subsidence and subsidence-related damage.

Current information provided in the plan and the proposed changed to the plan does not adequately address the above requirements.

As measured from the lease volumetrics map dated 10-1-91, main entry pillars measure 60 feet by 100 feet, panel entry pillars measure 50 feet by 100 feet, both with entry widths of 20 feet. Main entry pillars have 62.5% coal support and panel pillars have 59.5% coal support. Page 14-36 of the revised text indicates that the entry pillars in the mined section will be 55 feet by 100 feet, and would thus have 61.1% coal support. Assuming that the mine volumetric map is correct and the panel pillars are 50 feet by 100 feet a factor of safety for these pillars needs to be determined.

Pillar strength was determined by the operator to be 1821 psi for the purposes of pillar safety calculations. Based on mine progress information and pillar height information provided in the plan, the following parameters would be considered as the worst case for mining pillars in the area of questions:

Pillar Height	10 feet
Coal Strength	1821 psi
Vertical Stress	2000 psi
Recovery Factor	.405
Pillar Length	100 feet
Pillar width	50 feet
Entry width	20 feet

$$C_p = 1821(.778 + .222(50/10)) = 3438 \text{ psi}$$

$$F.S. = 3438(.595)/2000 = 1.02$$

Based on the above calculations, the panel located along the western edge of the State lease is marginally sufficient to support the coal without any second mining activity. Any second mining in this area would cause the reduced pillars to fail. Although the Recovery Factor is less than 50% as is normally indicated for pillars left to support the coal in buffer zones, the Factor of Safety indicates that no additional mining of this panel could occur and maintain the integrity of the pillars.

In Section 14.3.2.1.2 of the proposed plan, the operator has indicated that a criteria of 50% extraction will be used within a 21 degree angle of draw. This assumption is erroneous in the fact that the basis for protection from subsidence is based

on no more than a 50% Recovery Factor, and not on a 50% extraction ratio. At 50% extraction, pillars would be pulled and the panel would be allowed to cave which could result in surface subsidence beyond the angle of draw limit (the lease boundary) as indicated by the operator on Plate 14-1.

Inadequate design information has been presented in the current mining and reclamation plan and in the proposed changes to the plan regarding subsidence control and buffer zone to prevent or minimize damage outside of the permit area. Additionally, the information presented in the plan and the proposal is not adequate to address preventing subsidence from occurring under perennial streams. More detailed projections of these buffer zones, the methods of mining, pillar sizes, and geotechnical information must be presented in the plan to evaluate these areas. Geotechnical designs and modeling of these areas where pillars are to remain to protect perennial streams and minimized the affects of subsidence outside the permit area must be accomplished and presented in the mining and reclamation plan.

R614-301-525.200. Subsidence Control.

Information presented in the proposal and in the current plan still does not adequately address the subsidence control plan for the buffer zones required to prevent subsidence beneath the perennial streams found within the permit area. Detailed designs and mine plans must be presented by the operator to ensure that these areas will not be affected by mine subsidence.

More detailed study and design information will need to be presented by the operator in the plan to provide for the design of the buffer zones proposed for the permit boundary areas. Second mining or other mining activities proposed in the amendment are not considered adequate and cannot be approved at this time. A detailed, site specific geotechnical investigation studying the potential extent and effects of subsidence must be made and presented by the operator prior to approval of any mining activities other than those allowed under Stipulation R614-301-525. DWD.

The operator must submit a detailed plan of the underground workings. The detailed plan will include maps and descriptions, as appropriate, of significant features of the underground mine, including the size, configuration, and approximate location of pillars and entries, extraction ratios, measure taken to prevent or minimize subsidence and related damage, areas of full extraction, and other information required by the Division. Upon request of the operator, information submitted with the detailed plan may be held as confidential, in accordance with the requirements of R614-300-124. An updated map of the underground mine working will be submitted at a minimum, annually, in conjunction with the annual report.

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Recommendations:

It is recommended that the proposal submitted by the operator to revise the angle of draw and to allow second mining of the subsidence buffer zone be denied at this time.

The operator may provide additional information and resubmit this proposal for future consideration. The operator must however, submit plans to abate violation NOV N91-13-1-1, to account for inappropriate changes to the underground mining activities which have already occurred.



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INSPECTION REPORT

INSPECTION DATE & TIME: November 15, 1991
10:45 A.M. to 1:15 P.M.

Permittee and/or Operator's Name: Genwal Coal Co.
Business Address: P. O. Box 1201, Huntington, Utah 84527
Mine Name: Crandall Canyon Permit Number: ACT/015/032 County: Emery
Type of Mining Activity: Underground Surface Other
Company Official(s): Jay Marshall State Officials(s): Paul Baker Federal Official(s): None
Partial: Complete: Date of last Inspection: October 24, 1991
Weather Conditions: Cloudy, Light Snow, 30's
Acreage: Permitted- 2165.42 Disturbed- 5.55 Regraded- 0.5 Seeded- 0.5 Bonded- 5.6
Enforcement Action: None

COMPLIANCE WITH PERMITS AND PERFORMANCE STANDARDS

	YES	NO	N/A	COMMENTS
1. PERMITS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. SIGNS AND MARKERS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. TOPSOIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. HYDROLOGIC BALANCE:				
a. STREAM CHANNEL DIVERSIONS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. DIVERSIONS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. SEDIMENT PONDS AND IMPOUNDMENTS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. OTHER SEDIMENT CONTROL MEASURES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. SURFACE AND GROUNDWATER MONITORING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. EFFLUENT LIMITATIONS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. EXPLOSIVES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. DISPOSAL OF DEVELOPMENT WASTE & SPOIL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. COAL PROCESSING WASTE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. NONCOAL WASTE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. PROTECTION OF FISH, WILDLIFE AND RELATED ENVIRONMENTAL VALUES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. SLIDES AND OTHER DAMAGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. CONTEMPORANEOUS RECLAMATION	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. BACKFILLING AND GRADING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. REVEGETATION	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
14. SUBSIDENCE CONTROL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. CESSATION OF OPERATIONS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. ROADS				
a. CONSTRUCTION	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. DRAINAGE CONTROLS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. SURFACING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. MAINTENANCE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. OTHER TRANSPORTATION FACILITIES	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. SUPPORT FACILITIES				
UTILITY INSTALLATIONS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

INSPECTION REPORT

(Continuation sheet)

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PERMIT NUMBER: ACT/015/032

DATE OF INSPECTION: November 15, 1991

(Comments are Numbered to Correspond with Topics Listed Above)

4.a. Diversions

Checked diversion ditches and culverts. No areas requiring maintenance were identified.

Diversion UD-3, which was the subject of NOV 91-15-2-3, 3 of 3, had been repaired.

13. Revegetation

Temporary seeding was done this year on the 25% grade access road on the west side of the facility and on some small areas on the topsoil stockpiles where some material had been removed. I obtained a copy of the seed label, and all items were present in the proper amounts according to the plan except Rocky Mountain juniper. They were unable to obtain this seed, and it would not have been desirable for these areas.

18. Support Facilities

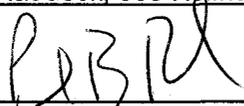
No construction was occurring on the unapproved addition to the shop/warehouse or on the new fan. These had been the subjects of NOV 91-15-2-3, 1 of 3.

Copy of this Report:

Mailed to: Jay Marshall (Genwal Coal), Bernie Freeman (OSM)

Given to: Daron Haddock, Joe Halfrich (DOGM)

Inspector's Signature: _____



Paul B. Baker #41 Date: November 25, 1991