

# TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

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November 7, 2005

TO: Internal File

THRU: D. Wayne Hedberg, Permit Supervisor

FROM: Wayne H. Western, Environmental Scientist III

RE: Longwall Extraction of Panel 7, West Ridge Resources, Inc., West Ridge Mine, C/007/0041, Task 2328

## **SUMMARY:**

The Permittee submitted task 2328 on September 9, 2005 for approval to conduct longwall (full extraction) mining in panel #7 at the West Ridge Mine. Currently the Permittee has approval to conduct development mining in panel #7. See task 2172 sent out on April 15, 2005. Before longwall mining can commence, the Permittee must demonstrate that longwall mining will not cause any safety concerns for the Grassy Trail Reservoir.

Several agencies are involved in the dam safety issue, including BLM, Dam Safety, the City of East Carbon and DOGM.

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**TECHNICAL ANALYSIS:**

## **OPERATION PLAN**

### **COAL RECOVERY**

Regulatory Reference: 30 CFR 817.59; R645-301-522.

**Analysis:**

The Permittee met the requirements for maximizing economic coal recovery. The R645 – Rules require that the Permittee describe the underground mining activities that will be 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 surface coal mining operations is minimized.

The Division uses several sources for determining if the Permittee met the requirements including the Bureau of Land Management (BLM) and the Utah School and Institutional Trust Lands Administration (SITLA). Appendixes 5-3, 5-3A and 5-3B contain the Resource Recovery Protection Plan (R2P2). The R2P2 contains the BLM findings the Permittee will maximize coal recovery. **Findings:**

The Permittee met the minimum requirements for the coal recovery requirements of the R645 – Rules.

### **SUBSIDENCE CONTROL PLAN**

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

**Analysis:**

#### **Renewable Resources Survey**

The Permittee met the minimum requirements for this section of the R645 – Rules. Those rules require that the Permittee include a survey, which shall show whether structures or renewable resource lands exist within the proposed permit area and adjacent area and whether subsidence, if it occurred, could cause material damage or diminution of reasonably foreseeable use of such structures or renewable resource lands. If the survey shows that no such structures or

renewable resource lands exist, or no such material damage or diminution could be caused in the event of mine subsidence, and if the Division agrees with such conclusion, no further information need be provided in the application under this section. The Permittee conducted the survey and determined that there were renewable resources with the subsidence zone.

The Permittee included in the subsidence section of the MRP, information on the quantity and quality of State-appropriated water.

### **Subsidence Control Plan**

In the event the survey shows that such structures or renewable resource lands exist, and that subsidence could cause material damage or diminution of value or foreseeable use of the land, or if the Division determines that such damage or diminution could occur, the application shall include a subsidence control plan which shall contain the following information:

- The Permittee met the requires to describe the method of coal removal, such as longwall mining, room-and-pillar removal, hydraulic mining, or other extraction methods, including the size, sequence, and timing for the development of underground workings. In section R645-301-525.100 subsection Description of Mining Methods; the Permittee describes the coal mining techniques that will be used at the West Ridge Mine. The Permittee shows the mine plan on Map 5-4A and Map 5-4B.
- The Permittee met the requirements for supplying a map of underground workings which describes the location and extent of areas in which planned-subsidence mining methods will be used and includes all areas where measures will be taken to prevent or minimize subsidence and subsidence related damage and, where appropriate, to correct subsidence-related material damage. Map 5-7, Subsidence Map, shows the areas where subsidence is expected to occur. Map 5-4A and Map 5-4B show the locations of existing and proposed underground workings.
- The Permittee met the requirements for describing the physical conditions, such as depth of cover, seam thickness, and lithology, which affect the likelihood or extent of subsidence and subsidence-related damage. In Section 525.100, subsection Description of Physical Conditions, and in the Geology section of the MRP, the Permittee describes the factors that control subsidence.
- The Permittee met the requirements for describing monitoring to determine the commencement and degree of subsidence so that, when appropriate, other measures can be taken to prevent, reduce, or correct material damage. In Section 525.100, subsection Subsidence Monitoring, and in subsection Subsidence Control, the Permittee states that they will use aerial photography to measure subsidence. The monitoring commitments are:

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- The Permittee will monitor the panels until vertical movement is less than six inches per year.
- The Permittee will make visual surface observations at least quarterly to determine the effects of subsidence. A record of those inspections will be kept at the mine.
- The Permittee will contract a study to determine if longwall mining could potentially cause damage the Grassy Trail Reservoir.

For mining panel #7, the Permittee committed to do additional monitoring at and around the Grassy Trail Reservoir, See Section 525.200 of the MRP.

- The Permittee met the requirements for providing a detailed description of the subsidence control measures that will be taken to prevent or minimize subsidence and subsidence-related damage, including, but not limited to: backstowing or backfilling of voids; leaving support pillars of coal; leaving areas in which no coal is removed, including a description of the overlying area to be protected by leaving the coal in place; and, taking measures on the surface to prevent material damage or lessening of the value or reasonably foreseeable use of the surface. In Section 525.100 of the MRP, the Permittee states that longwall mining will be used when feasible and that the only permanently planned pillars are to support main entries. In Section 525.200 and in Appendix 5-9, the Permittee states the measures that will be used to monitor subsidence effects on the Grassy Trail Reservoir.
- The Permittee met the requirements for describing the anticipated effects of planned subsidence. The Permittee described the subsidence effects in section R645-301-525.100, subsection Mine Subsidence Effects and Control Measures, of the MRP. In Appendix 5-9, the Permittee describes the anticipated effects of subsidence on the Grassy Trail Reservoir.
- The Permittee met the requirements for describing the measures to be taken to mitigate or remedy any subsidence-related material damage to, or diminution in value or reasonably foreseeable use of the land, or structures or facilities to the extent required under State law. The Permittee included a description in Section 525.480 of the MRP of methods that could be used to mitigate the loss of State appropriated water. Those methods include:
  - Seal cracks with bentonite clay. The material would be transported to the area by pack animals and the work would be done by hand.
  - If heavy equipment or significant amounts of bentonite clay are needed then an access road would be constructed.
  - If sealing cracks is ineffective the Permittee would install pipes as needed.

- The Division required that the Permittee provide a dam safety study for the Grassy Trail Dam that specifically analyses how mining could affect the dam. The Permittee provided dam safety studies in Appendix 5-9 and Appendix 5-9A. Both Appendixes were prepared by RB&G Engineering and certified by a professional engineer.

Appendix 5-9 dealt specially with mining related issues such as subsidence, seismic events and landslides. The subsidence study in Appendix 5-9 was conducted by Agapito and Associates, Inc. The conclusions of the reports are that full extraction mining of Panel #7 is unlikely to cause any problems for the Grassy Trail Reservoir. The reports also make recommendation for monitoring the Grassy Trail Reservoir. The Permittee committed to do those recommendations in Section 525.200 of the MRP.

Appendix 5-9A deals with other dam safety issues that may or may not be mining related. Because of the overlap of the two studies the Permittee included both reports. The Grassy Trail Reservoir has been classified by the Dam Safety as a high risk structure. RB&G Engineering makes specific recommendation to upgrade the dam in Appendix 5-9A. Since the recommendations are to the dam and are independent of mining, the Division will not require the Permittee to take specific action. Dam Safety received a copy of Appendix 5-9 and Appendix 5-9A.

### **Performance Standards For Subsidence Control**

The Permittee met the requirement for the subsidence control performance standards. The Permittee is required to either adopt measures consistent with known technology which prevent subsidence from causing material damage to the extent technologically and economically feasible, maximize mine stability, and maintain the value and reasonably foreseeable use of surface lands; or, adopt mining technology which provides for planned subsidence in a predictable and controlled manner. The Permittee will use longwall methods where feasible. In areas where structures exist that need protection the Permittee will not mine, and therefore not subside the area.

The Division conducts monthly inspection to ensure that the Permittee complies with all provisions of the approved subsidence control plan.

The Division will require the Permittee to correct any material damage resulting from subsidence caused to surface lands, to the extent technologically and economically feasible, by restoring the land to a condition capable of maintaining the value and reasonably foreseeable uses which it was capable of supporting before subsidence, and, to the extent required under applicable provisions of State law, either correct material damage resulting from subsidence caused to any structures or facilities by repairing the damage or compensate the owner of such structures or facilities in the full amount of the diminution in value resulting from the subsidence.

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Repair of damage includes rehabilitation, restoration, or replacement of damaged structures or facilities. Compensation may be accomplished by the purchase prior to mining of a non-cancelable premium-prepaid insurance policy.

The Division will not allow underground mining activities be conducted beneath or adjacent to: public buildings and facilities; churches, schools, and hospitals; or, impoundments with a storage capacity of 20 acre-feet or more or bodies of water with a volume of 20 acre-feet or more, unless the subsidence control plan demonstrates that subsidence will not cause material damage to, or reduce the reasonably foreseeable use of, such features or facilities. If the Division determines that it is necessary in order to minimize the potential for material damage to the features or facilities described above or to any aquifer or body of water that serves as a significant water source for any public water supply system, it may limit the percentage of coal extracted under or adjacent thereto.

If subsidence causes material damage to any of the features or facilities, the Division may suspend mining under or adjacent to such features or facilities until the subsidence control plan is modified to ensure prevention of further material damage to such features or facilities.

The Division shall suspend underground mining activities under urbanized areas, cities, towns, and communities, and adjacent to industrial or commercial buildings, major impoundments, or perennial streams, if imminent danger is found to inhabitants of the urbanized areas, cities, towns, or communities. However, such structures are not present in the permit area. The Division will take steps to prevent subsidence damage to the Grassy Trail Reservoir.

Within a schedule approved by the Division, the Permittee will submit a detailed plan of the underground workings. The detailed plan shall 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, measures 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. The Permittee is required to supply mine working maps annually as part of the annual report.

### **Notification**

At least 6 months prior to mining, or within that period if approved by the Division, the Permittee will mail a notification to all owners and occupants of surface property and structures above the underground workings. 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. The Division will check subsidence notification during the monthly inspections.

**Findings:**

**MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS**

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

**Analysis:**

**Mine Workings Maps**

The Permittee met the minimum requirements for providing update mine working maps. Map 5-4A, Map 5-4B and Map 5-7 show the project mine workings and areas of potential subsidence.

**Certification Requirements**

The Permittee met the minimum requirements for certification of maps and cross sections.

**Findings:**

The Permittee met the minimum requirements for maps, plans and cross sections for the mining operations as prescribed by the R645 – Rules.

**RECOMMENDATIONS:**