

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

March 15, 2011

TO: Internal File

THRU: Ingrid Campbell, Mine Lead *ORA for*

FROM: Steve Christensen, Environmental Scientist *SISC*

RE: Penta Creek Lease Extension, West Ridge Resources, West Ridge Mine, Permit # C/007/0041, Task #3777

SUMMARY:

On March 14th, 2011, the Division of Oil, Gas and Mining (the Division) received an amendment from West Ridge Resources (the Permittee). The amendment proposes to revise the West Ridge Mine permit area with the addition of 555.33 acres. The expansion is located with the Penta Creek Lease, Federal Lease UTU-78562 and SITLA lease ML-51744. The amendment was previously submitted to the Division for review on February 1st, 2011 (Task ID #3733). The technical analysis identified deficiencies with the amendment and returned it to the Permittee on March 2nd, 2011.

The area of proposed mining is located north and adjacent to the Grassy Trail Reservoir. The depth of cover in the expansion areas is considerable ranging from 2,000-3,000 feet. Due to the overburden depths, the Permittee proposes to utilize a panel/barrier longwall mining technique in order to maximize safety. The panel/barrier mining technique has been used previously at the West Ridge Mine in the north-western portions of the permit area in State Lease ML-47711 and Federal Lease UTU-78562. The panel/barrier mining that occurred in these areas produced significantly reduced amounts of subsidence.

Three deficiencies were identified relative to the hydrology section of the State of Utah R645-Coal Mining Rules. The Permittee was directed to:

- 1) Provide the complete November 1999 spring and seep survey,
- 2) Provide baseline data to characterize the Right Fork of Whitmore Canyon and
- 3) Establish a surface water monitoring point on the Right Fork of Whitmore Canyon.

The Permittee has provided the information and the amendment is recommended for approval.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Baseline Information

The application meets the baseline information requirements of the State of Utah R645-Coal Mining Rules.

The previous technical analysis (Task ID #3733) identified a deficiency relative to baseline data for the Right Fork of Whitmore Canyon. The previous amendment did not contain any baseline information for that drainage. The Permittee was directed to provide sufficient baseline information that characterizes the Right Fork of Whitmore Canyon.

The Permittee provides baseline data for the Right Fork of Whitmore Canyon in Appendix 7-14, *Grassy Trail Reservoir Right Fork Historical Flow Data*. The data was obtained from multiple sources including; Leon Pressett, Former East Carbon City Water Master, M. Page & R. Wilde- Division of Water Rights, Dana Marrelli, Utah American Energy and Warren Monroe, Jones and DeMille Engineering, Inc. The data ranges from 1962 to the present. Dana Marelli from Utah American Energy obtained flow data on the Right Fork of Whitmore Canyon for the 3rd and 4th quarters of 2010.

The previous technical analysis had identified a deficiency relative to the 1999 spring and seep survey that was conducted in the proposed expansion area. The Permittee was directed to provide the complete November 1999 spring and seep inventory report presented in Appendix 7-6A (including all maps and figures cited in the report). Upon review of the previously submitted 1999 spring and seep survey, it was unclear as to what the boundaries of the survey area were and the locations of the seeps and springs that were identified. The current amendment provides the entire seep and spring survey including the whole study area map. The information is presented in Appendix 7-6A.

Appendix 7-5, Water Rights Summary, has been updated to reflect the water rights within the proposed expansion area. Additionally, Map 7-3, Water Rights, has been revised to depict the water rights. Two point-to-point surface water rights are located on the Right Fork of Whitmore Canyon (91-2038 and 91-3519).

Probable Hydrologic Consequences Determination

The application meets the Probable Hydrologic Consequences Determination of the State of Utah R645-Coal Mining Rules.

The Permittee discusses the potential for impacts to the Grassy Trail Reservoir beginning on page 7-24. The Division approved a mine plan revision in 2005 that allowed longwall mining to occur directly adjacent to the Grassy Trail Reservoir. Panel #7 was the closest in proximity to Grassy Trail Reservoir (completed mining in September 2006). Based upon the information submitted by RB&G consultants, there was no mining related damage to the dam as result of the full extraction of Panel #7. The integrity of the earthen structure of the dam was maintained.

Following the completion of Panel #7, the longwall was moved approximately 2 miles to the west. As a result of the significant amount of overburden in this area, a panel/barrier longwall mining method was initiated at that time. The panel/barrier system leaves a 400' wide barrier pillar between each longwall panel which greatly reduced the magnitude and frequency of mining-related seismic events. The proposed mining block in this application will be more than three times further away from the dam than Panel #7 and will utilize a panel/barrier configuration. As a result, the potential for impacts to the Grassy Trail Reservoir are minimal.

The potential impacts to surface water resources are minimal as well. A barrier pillar of coal is located directly below the Left Fork of Whitmore Canyon (See Map 5-7, Subsidence map). No planned subsidence will occur on the Right Fork of Whitmore Canyon. Development mining only will occur below the Right Fork drainage. The amount of overburden in the area of the Right Fork of Whitmore Canyon ranges from 2,500-3,000' below grade. As a result of this extensive cover, the potential for impacts to this drainage are considered minimal.

Findings:

The application meets the Hydrologic Information requirements of the State of Utah R645-Coal Mining Rules.

OPERATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

Surface-Water Monitoring Plan

The application meets the Surface-Water Monitoring Plan requirements of the State of Utah R645-Coal Mining Rules.

The previous technical analysis had identified a deficiency relative to the surface water monitoring plan. The Permittee was directed to establish a surface water monitoring point on the Right Fork of Whitmore Canyon in order to collect pre-mining baseline and operational data for this drainage.

Sample point RST-1 was established the 3rd quarter of 2010. The site is located on the Right Fork of Whitmore Canyon above Grassy Trail Reservoir. Additionally, on page 7-41, the Permittee discusses Grassy Trail flumes LF-1 and RF-1. Flumes are currently located on both the Left and Right Forks of Whitmore Canyon. However, the flumes require maintenance/repair work before they can be utilized for data collection. The Permittee commits to reconstructing the flumes during the 2011 construction season. Once the flumes become operational, continuous flow monitors will be installed. The flow data will be submitted to the Division on a quarterly basis.

Table 7-1, Hydrologic Monitoring Protocols and Locations has been revised to reflect the addition of surface water monitoring sites RST-1, LF-1 and RF-1. Additionally, Map 7-7, *Operational Monitoring Locations*, has been revised to depict surface water monitoring locations RST-1, LF-1 and RF-1.

Stream Buffer Zones

The application meets the Stream Buffer Zone requirements of the State of Utah R645-Coal Mining Rules.

No subsidence is planned along the Left and Right forks of Whitmore Canyon. The mine projections depicted on Map 5-4A, Mining Projections shows a barrier pillar directly underneath

the Left Fork of Whitmore Canyon. Mine development will occur beneath the Right Fork of Whitmore Canyon but not longwall coal extraction.

Impoundments

The application meets the Impoundment requirements of the State of Utah R645-Coal Mining Rules.

The proposed lease expansion outlines the full extraction of longwall panels 18-20. The panels are located approximately 3,000' away from the Grassy Trail dam and approximately 2,220' lower than the reservoir. The panels are located more than three times further away from the dam than the longwall mining that occurred on panel #7 in March of 2006. The full extraction of panel #7 was the closest point of mining activity to the Grassy Trail Reservoir. Monitoring of the Grassy Trail Reservoir dam was conducted continuously before, during and after the mining of panel #7. Based upon the seismicity data collected by RB&G Engineering (See Appendix 5-16), there was no mining related damage to the dam.

In September 2010, RB&G Engineering prepared a summary report of the subsequent mining-induced seismicity adjacent to Grassy Trail Reservoir from January 2008 – July 2010 (See Appendix 5-17). The report concludes that it's apparent that "mining activity in the West Ridge Mine have caused mining-induced seismic events, and that ground motions caused by these events are detectable at Grassy Trail Dam and Reservoir." However; the report indicates that the ground motions caused by the mining have not impaired the function or performance of the Grassy Trail dam, "*Despite the recorded deformations, the dam appears to be performing well, and ongoing deformations have been very small to negligible since mining of Panel 7 concluded in the fall of 2006*". The RB&G report further recommends that continued monitoring of seismic movement at the dam continue.

Additionally, the longwall mining method for the proposed lease expansion will be a panel/barrier/panel design due to the depth of cover in the area. The panel/barrier/panel configuration produces dramatically less seismic movement as a result of subsidence associated longwall mining.

On February 24th, 2011, a meeting of stakeholders occurred at the Department of Natural Resources Price, UT field office. Representatives from RB&G Engineering provided an overview of the seismicity monitoring and resulting land movement that has occurred as a result of mining in the area of the Grassy Trail Reservoir. During the presentation, Bret Dixon from the Utah Division of Dam Safety raised an issue with data collected from one of the monitoring piezometers located within the Grassy Trail dam. Mr. Dixon was concerned that data obtained from Piezometer 12 had inexplicably exhibited a significant drop in elevation beginning in the early summer of 2010. Following the sharp reduction in elevation, the water levels obtained in Piezometer 12 remained low until the present. Representatives from RB&G Engineering as well

as representatives from the City of East Carbon indicated that they were aware of the reduction in elevation readings in the piezometer and that they would investigate what the possible causes were.

On March 16th, 2011, Michael Hansen from RB&G Engineering sent out an e-mail outlining the investigation into the anomalous readings at Piezometer 12. Mr. Hansen indicated that following the installation of the piezometer, a water level indicator could only be dropped to 72' rather than the 85' depth. Mr. Hansen indicated that he believed that there was a partial blockage at 72' and that the water was able to rise through it.

On March 9th, 2011, RB&G Engineering met with Burt Krause (City of East Carbon City) at the site. They were unable to get the water probe down to the 84' level that had been reported during the past months. The following day, an air probe was inserted into the piezometer and compressed air was forced down into the hole. They were successful in removing the blockage and opening the hole down to the bottom of the piezometer (85').

Division of Oil, Gas and Mining representative Steve Christensen discussed the data issue at Piezometer 12 with Mr. Bret Dixon of Dam Safety. Mr. Dixon had discussed the situation at Piezometer 12 with RB&G and although no satisfactory answer could be obtained as to why there was such a sharp reduction in water level, Mr. Dixon was pleased that RB&G was once again involved with the data collection and monitoring at the Grassy Trail Reservoir. Continued monitoring of all piezometers and seismic equipment will continue.

Findings:

The application meets the Hydrologic Information requirements of the State of Utah R645-Coal Mining Rules.

RECLAMATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

Hydrologic Reclamation Plan

The amendment meets the Hydrologic Reclamation Plan requirements of the State of Utah R645-Coal Mining Rules.

No additional surface disturbance is planned with the proposed IBC. As a result, the Hydrologic Reclamation Plan requirements do not require revisions at this time.

Findings:

The amendment meets the Hydrologic Reclamation Plan requirements of the State of Utah R645-Coal Mining Rules.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

Analysis:

The amendment meets the Cumulative Hydrologic Impact Assessment (CHIA) requirements of the State of Utah R645-Coal Mining Rules.

The proposed expansion areas are within the existing CHIA and have been evaluated for potential mining induced impacts to the hydrologic balance within the cumulative impact area.

Findings:

The amendment meets the Cumulative Hydrologic Impact Assessment (CHIA) requirements of the State of Utah R645-Coal Mining Rules.

RECOMMENDATIONS:

The amendment is recommended for approval at this time.

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