

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

March 24, 2006

TO: Internal File

THRU: Wayne Western, Environmental Scientist/Engineering, Team Lead

FROM: Steve Fluke, Reclamation Hydrogeologist

RE: Division Order 4.6-00, West Ridge Resources, Inc., West Ridge, C/007/0041, Task ID #2445

SUMMARY:

West Ridge Resources, Inc. submitted a response to deficiencies of their proposed highwall reclamation plan on February 24, 2006. The submittal was assigned Task ID #2445 by the Division and is in response to the last review of the plan that was assigned Task ID #2233. The plan includes Appendix 5-9, Alternate Highwall Reclamation Plan, which describes the reduction of the slope of the reclaimed highwall area and the re-alignment of the original streambed. The area being discussed is included in an Experimental Practice dealing with reclamation. As part of the Experimental Practice, the original streambed surface was left intact and marked with flagging and geotextile fabric. The intent at reclamation is to uncover the original streambed and surrounding area and have very little alteration or additional reclamation of the streambed because it should be relatively undisturbed. Appendix 5-9 modifies this plan (hydrologically) by re-aligning a 500-foot section of the streambed.

This review is for the hydrologic aspects of the alternate highwall reclamation plan submittal (Task ID #2445). The hydrologic deficiencies have been adequately addressed in the revised plan and no new deficiencies have been determined. The plan should be approved and the proposed Appendix 5-9 should be incorporated into the West Ridge Mining and Reclamation Plan (MRP).

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TECHNICAL ANALYSIS:

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 application meets the Hydrologic Information of the Hydrologic Reclamation Plan as provided in R645-301-761. Appendix 5-9 presents an alternate highwall reclamation plan that includes a reconstruction design for 500 feet of the main stream channel in C Canyon designated as RC-GG. Because RC-GG is a permanent diversion of an intermittent stream, the channel design must be adequate to contain the peak flow of a 100-year, 6-hour precipitation event. The proposed design for RC-GG is for trapezoidal channel that allows for the first 350 feet of the channel to be unlined with some potential for encountering bedrock to create a natural armor. The last 150 feet of the proposed design allows for a rip-rap channel. Channel flow calculations and figures showing channel profiles are presented in the appendix.

The RC-GG channel reconstruction design is acceptable following revisions due to deficiencies determined by the Division from the last review (Task ID# 2233). Two of the deficiencies concerned the slope of the channel reconstruction and that the flow velocities for a portion of the channel exceeded 6.0 feet per second (fps) limiting velocity for an unlined channel. These deficiencies have been addressed by stating the correct channel slope and decreasing the flow velocity below 6.0 fps by widening the stream channel to approximately 15 feet. The final design shows 350 feet of unlined channel with a flow velocity of 5.8 fps, and 150 feet of rip-rap channel. The rip-rap portion of the channel has been designed to appear more natural with the addition of some large rocks (18D50 or greater), a 12-inch soil cover, and hydroseeding of the restored channel.

Sediment Control Measures

Section 4.2 of Appendix 7-4 of the MRP, Reclaimed Area Drainage Control, identifies the primary sediment control as extreme-roughening or “gouging” of the surface with the a backhoe. Prior to removal of sediment ponds, a series of four (4) silt fences will be installed

across the main drainage channel. These silt fences will remain as final treatment for runoff from the reclaimed site until Phase II Bond requirements are met.

The re-alignment of the channel assumes there will be little soil development – potentially there will be more of an issue working with existing bedrock in the stream channel. At the Division’s request, portions of the re-aligned stream channel with greater than 2-feet of soil development will be armored. This will be consistent with the armoring of the highwall toe, and should keep the flow within the designed channel.

Findings:

The application meets the requirements of the Reclamation Plan – Hydrologic Information section of the State regulations.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

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

Analysis:

Reclamation Backfilling And Grading Maps

Plates 1 through 5 of Appendix 5-9 present the RC-GG channel relocation, reclaimed channel and highwall cross-sections, original and reclaimed channel profiles, reclamation contours, and area types. Figures 3, 4, and 5 present cross sections of the trapezoidal channel reconstruction, rock drop structures, and rip-rap channel reconstruction. The plates and figures have been updated where necessary to reflect the final design modifications as requested by the Division (Task ID #2233).

Findings:

The application meets the Reclamation Plan – Maps, Plans, and Cross Sections of Reclamation Operations section of the State regulations.

RECOMMENDATIONS:

The Permittee has addressed deficiencies outlined by the Division. Incorporation into the existing MRP is recommended.