

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

June 15, 2009

TO: Internal File

THRU: Daron Haddock, Permit Supervisor *RORH*

FROM: Steve Christensen, Hydrologist *SKC*

RE: Include Catchment Structures, West Ridge Resources, Inc., West Ridge Mine, C/007/0041, Task ID #3309

SUMMARY:

On June 8th, 2009, the Division of Oil, Gas and Mining (the Division) received an application from West Ridge Resources, Inc., (the Permittee) for the inclusion of four already constructed sub-catchments into the approved Mining and Reclamation Plan (MRP) for the West Ridge Coal Mine.

On January 29th, 2009, the Division issued a Notice of Violation (NOV #10033) to the Permittee after the Division was notified of excess coal fines being deposited within the C Canyon Drainage directly down gradient from the West Ridge Mines mine-water discharge point. As part of NOV #10033, the Permittee was required to submit a mitigation/clean-up plan. As part of the mitigation/clean-up plan, the Permittee designed and constructed a series of four sub-catchments within the C Canyon drainage to aid in the containment and removal of the material from the site.

The sub-catchments (A, C, E and F) were to be temporary in nature and reclaimed once the coal fine material was removed and NOV #10033 abated. However, upon consultation with the Bureau of Land Management (BLM), the four sub-catchments will remain on site for a period longer than the 2009 construction season. As a result, the Permittee has submitted the application primarily to incorporate the sub-catchments into the already approved MRP. In addition, the Permittee has addressed deficiencies identified by the Division during the recent review of the submitted mitigation and abatement plan submitted in response to NOV #10033 (Task #3257).

The application has met the State of Utah R645-Coal Mining Rules relative to hydrology and is recommended for approval.

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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:

Sampling and Analysis

The application meets the Sampling and Analysis requirements of the State of Utah R645-Coal Mining Rules.

The construction of the four sub-catchments will not require additional sampling and analysis. The approved water-monitoring program for the West Ridge facility contains three actively monitored surface water-monitoring points on the C Canyon Drainage: ST-5, ST-6 and ST-6A.

Baseline Information

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

Baseline information for the C Canyon Drainage is presented in Appendix 7-1 of the approved MRP (*Investigation of Surface-Water and Groundwater Systems in the West Ridge Area, Carbon County, Utah, January 19th, 1998*). Based upon the results of the ground and surface water analysis conducted by the Permittee, the C Canyon Drainage is an ephemeral drainage. Steep slopes and steep stream gradients characterize the canyon. Prior to the West Ridge Mine pumping ground water encountered within the mine workings, the C Canyon Drainage behaved and was characterized as an ephemeral drainage producing flow only in response to spring snowmelt and rainfall events.

The spring and seep survey conducted by the Permittee (See Appendix 7-1 and Map 7-5, *Seep/Spring Survey Map*), identified three springs in the C Canyon watershed: Springs S-7, S-8 and S-8. Of these three springs, Spring Sp-8 is the only spring observed that produced

appreciable flow. As Spring SP-8 is located over one-mile up gradient from the discharge point of Outfall 002, there is no potential for this spring to be impacted by the additional contributions of sediment currently discharging from the mine or from the construction and operation of the four catchments.

Probable Hydrologic Consequences Determination

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

The installation of the four sub-catchments in the C Canyon Drainage presents minimal potential for impacts to the hydrologic balance. As established by the baseline information presented in Appendix 7-1 of the approved MRP, the C Canyon Drainage is ephemeral, producing flow only in response to spring snowmelt and rainfall events. As a result, the retention and velocity reduction produced by the operation of the four sub-catchments is of no consequence to the natural function and hydrologic characteristics of the C Canyon Drainage.

Each of the sub-catchments is designed with a diversion pipe that, when utilized, is capable of routing the mine-water discharge around the sub-catchments. The diversion will allow the Permittee to effectively remove/clean-out the coal fine material from the sub-catchments. The vast majority of coal fine material is located up gradient from Catchment A. At such a time when Catchment A requires maintenance/cleaning, the flow will be diverted and Catchment C will then intercept any coal fine material suspended in the mine-water discharge. As a result, the redundancy of utilizing four catchments insures that a majority of the material dislodged during the cleanout above Catchment A or during the subsequent clean-up of Catchments A and C, will be collected and disposed of.

Findings:

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

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OPERATION PLAN

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 784.24, 817.150, 817.151; R645-301-521, -301-527, -301-534, -301-**732**.

Analysis:

Plans and Drawings

The application meets the Plans and Drawings requirements for Road Systems and Other Transportation Facilities as required by the State of Utah R645-Coal Mining Rules.

The four catchment structures have been constructed on pre-existing roads outside of the existing West Ridge Permit area. As there is no new road construction associated with these catchment structures, the design and performance standards relative to road systems and other transportation facilities is not applicable.

Findings:

The application meets the Plans and Drawings requirements for Road Systems and Other Transportation Facilities as required by the State of Utah R645-Coal Mining Rules.

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -**301-745, -301-746, -301-747**.

Analysis:

Coal Mine Waste

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

On page 4 of the application, the Permittee describes how the coal-fine material will be handled and disposed of during the clean-up phase of the project. The coal-fine material that accumulates in the catchment structures will be cleaned out using a backhoe and/or a slurry

pump. The Permittee commits to sampling the removed material and analyzing for the parameters outlined in Table 3 and Table 7 of the Division's *Guidelines for Management of Topsoil and Overburden*, January 2008. The removed material will then be hauled to and disposed of at the Wildcat Loadout. If the material is solid enough, the Permittee will place it directly on a permitted refuse pile. In the event that the material is more liquid in consistency, it will be pumped into Sediment Pond C of the Wildcat Loadout. Attachment 15 of the application contains stage-volume information for Sediment Pond C. Based on the provided calculations, Sediment Pond C can readily receive approximately 2.577 acre-feet of material and still safely handle the 10-year, 24-hour storm event as required by the State of Utah R645-Coal Mining Rules.

The catchments structures utilize a weir type structure that is equipped with excelsior filter logs. The logs are installed down gradient from the catchment and provide additional removal of suspended coal fine material. On page 6 of the application, the Permittee discusses the utilization and disposal of the filter logs. As the filter logs become saturated with coal fine material/sediment, they will be removed and replaced with new ones. The saturated filtration logs will then be removed and disposed of at an approved facility such as ECDC Environmental LC.

Findings:

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

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:

Water-Quality Standards And Effluent Limitations

The application meets the Water-Quality Standards and Effluent Limitations requirements of the State of Utah R645-Coal Mining Rules.

On page 10 of the application, the Permittee discusses a plan to minimize the potential for future discharges of coal fines from the mine. The plan consists of an underground treatment system that is currently under construction. The underground treatment system will consist of a

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chemical treatment where a coagulant is mixed with the contaminated mine water. The coagulant will accelerate the rate in which suspended coal fine particles, as well as iron particulates. The mine water will then be pumped into a portion of the mine that has been sealed where the coagulated solids will be allowed to settle out. Within the sealed mine areas, the Permittee has constructed a series of catchment dams which are designed to provide a detention area for the coagulated solids.

Attachment 14 of the application depicts the basic elements of the underground treatment system for both the current condition as well as the proposed system discussed above. The Permittee states, "the new treatment facility, including piping, pumps, retention dams and chemical injection, is scheduled to completed and operational during the summer of 2009". Attachment 12 of the application contains the Material Safety Data Sheet (MSDS) for the flocculent that will be utilized in the underground treatment system.

Sediment Control Measures

The application meets the Sediment Control Measures as required by the State of Utah R645-Coal Mining Rules.

The four catchments are sediment control measures that are being utilized to facilitate the containment and clean up of the additional sediment/coal fines deposited within the C Canyon Drainage from the mine water discharge at Outfall 002.

The catchments provide sediment control by utilizing both retention and filtration of the mine water discharge. A catchment or stilling basin has been excavated at each of the four locations. The basins have been excavated out of the natural drainage channel. A small low-lying impoundment dam has been constructed to contain the mine-water. In addition, a series of filtering devices have been installed within the dam. The filtration is achieved by utilizing excelsior filter logs. The logs have been placed in a fabricated steel weir like structure that secures the logs in place. The weir structure allows for fast and easy replacement of the logs once they become saturated with sediment and no longer function.

Diversions: General

The application meets the Diversions: General requirements of the State of Utah R645-Coal Mining Rules.

Each of the 4 catchments will utilize a 12" diameter poly-pipe with which to divert the C Canyon Drainage around the catchments in order to facilitate the cleaning and removal of coal fine material. A 12" diversion pipe will adequately and safely pass the flow given the flow of approximately 500-800 gallons per minute currently discharging from Outfall 002.

Findings:

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

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:

Mining Facilities Maps

The application meets the Maps, Plans, and Cross Sections of Mining Operations requirements of the State of Utah R645-Coal Mining Rules.

Map 1-0, *Permit Map*, depicts the current permit area including the four catchment areas and their locations on the C Canyon Drainage.

Plate #1 of 1, *'C' Canyon Drainage Location Map Catchment Structures*, depicts already constructed catchments A, C, E and F. In addition, Plate #1 of 1 depicts the locations of proposed catchment structures B and D. Catchment structures B and D were initially proposed during early discussions as to how best to mitigate the coal fine material in the channel. Upon consultation with the various regulatory agencies, it was agreed that four catchment structures would be adequate.

Attachment 8 provides pre-construction photographs of all four catchment areas.

Attachment 10 of the application provides the as-built drawings for catchments A, C, E and F. The drawings provide clear depictions of the various components of the catchment installations.

Findings:

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

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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 Reclamation Plan requirements of the State of Utah R645-Coal Mining Rules.

The Permittee outlines the details of the reclamation plan beginning on page 7 of the application. Though the BLM right-of-way grants three years for the utilization of the catchment structures, the time period can be extended under the terms of the grant. Initially the catchment structures were to be utilized on a temporary/short-term basis. However, after consulting with the Permittee and other regulatory agencies, it was determined that retaining the catchments for a longer period of time may prove beneficial. The water quality concerns associated with the mine-water discharge are on going and it's uncertain as to whether the underground mine-water treatment system will be effective. As a result, catchments A and C will be left in place until such time that the Permittee and the regulatory agencies concur that they are no longer necessary and may be reclaimed.

The reclamation details are further outlined on page 8 of the application. The reclamation of the catchments will include the diverting of the mine-water drainage around the area so as to allow the Permittee to work in dry conditions. The water impounded in the catchments will then be drained off and any remaining coal fine material will be removed and hauled off-site. The steel, weir structures will be removed and hauled off-site for disposal. The low-lying embankments/dams will be excavated and that material will be utilized to fill the catchments. The remaining areas of the catchments will be backfilled utilizing material from the adjacent equipment access ramps. In doing so, the stream channel will be restored as it is backfilled.

Large boulders and rocks will be placed within the channel and along the banks to mimic pre-existing channel morphology. The boulders will further act as additional erosional control until the reclaimed contours/back-filled areas are stabilized.

After all re-contouring and stream channel reconstruction has been completed, the diversion pipes will be removed. Once the diversions have been removed and the channel water flow has resumed, the final re-contouring of the channel will be done. The reconstructed channel banks will be roughened and scarified in preparation for re-seeding.

The disturbed areas will be re-seeded by utilizing a BLM approved mixture. Attachment 13 contains the proposed seed mix. The seed will be hand broadcast and then raked in. Following the re-seeding, a layer of wood straw will be scattered over the reclaimed areas. The Permittee proposes to re-seed the areas in the fall in order to increase the potential for successful germination the following spring.

Findings:

The application 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 application meets the Cumulative Hydrologic Impact Assessment requirements of the State of Utah R645-Coal Mining Rules.

The four catchments constructed in the C Canyon Drainage

Findings:

The application meets the Cumulative Hydrologic Impact Assessment requirements of the State of Utah R645-Coal Mining Rules.

RECOMMENDATIONS:

The application is recommended for approval.