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TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

April 27, 2010

TO: Internal File

THRU: Daron Haddock, Lead 

FROM: James Owen, Reclamation Engineer 

RE: Winter Quarters Ventilation Facility, Canyon Fuel Company, LLC, Skyline Mine, C/007/0005, Task ID #3504

SUMMARY:

On March 23, 2010 the Division received a re-submittal of the Winter Quarters Ventilation Facility application from Canyon Fuel Company, LLC. The new application identifies modifications for the purpose of addressing past-identified deficiencies. The Winter Quarters Canyon Facility proposes to add approximately 7.93 acres to the permit area. The site is located approximately 1/2 mile west of the main historic Winter Quarters town site.

The ventilation facility will include 3 mine openings. These openings will be a 20-foot diameter vertical shaft, an 8-foot diameter escape shaft, and a 20-foot wide slope driven at 18 degrees down. When sealing at reclamation, the shafts will be completely backfilled. The slope will be filled with incombustible material for a distance of at least 25 feet into the opening.

Engineering design specifications for the Winter Quarters Ventilation Facility pond were included with the application. Canyon Fuel Company, LLC plans to construct the facility in Summer 2010.

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TECHNICAL ANALYSIS:

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Analysis:

All highwalls and cutslopes will be reclaimed using geotechnically stable fill slopes with surfaces that have been sufficiently roughened with deep gouging. The pad will be graded back to the approximate original contour at a 2:1 slope. Slope stability and failure calculations and analyses are included in Attachment C of the application package.

Findings:

In terms of engineering and design specifications, the application meets the requirements of the State of Utah R645-Coal Mining Rules.

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

Reclamation will include both shafts being sealed and backfilled with an engineered fill. The bottom 55-feet of the shaft will be filled with non-combustible material as follows starting at the bottom of the shaft:

- 20 feet of large, course 6"+ rock (includes mine opening)
- 10 feet of 2"-4" rock
- 5 feet of gravel
- 5 feet of sand
- 5 feet of granular bentonite
- 5 feet of concrete
- 5 feet of granular bentonite

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The remainder of the shafts will then be backfilled above the pad surface with the excess fill. The fill process for the bottom 50 feet of the shafts has been designed to minimize the accumulation of gas and the filling of water in the shafts. The shaft reclamation design addresses mass stability and movement in multiple ways: grading saturation, bentonite-concrete are utilized as cap and seal to reduce possibility of saturation and mass movement, and overfill provides an addition 5% for compaction and settling. It is proposed the shaft be filled and allowed to settle for approximately one (1) year prior to completely reclaiming the pad to AOC. In section 4.9, Figure 4.9-B depicts the WQVF vent and escape shaft.

For the slope, sealing will consist of solid, substantial, incombustible material for a distance of at least 25 feet into the opening. Permanent closure measures will be designed to prevent access to mine workings by people, livestock, fish and wildlife to keep acid or other toxic drainage from entering groundwater or surface waters. Figure 4.9-C depicts the WQVF slope.

Findings:

The modified application includes the required details for shaft fill design. The design is adequate to comply with 30 CFR Part 75.1711 and R645-301-551. The applicant has demonstrated that the shaft will be stable in terms of mass movement. The shaft will be filled using a design based on prudent engineering practices. The slope entry fill designs are also sufficient to satisfy Coal Mining Rules requirements.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Analysis:

Road designs for the ancillary road to be constructed/used are illustrated on Plates 3.2.4-3B and 3.2.4-3E. The road drawing and details included in the plates applies to all roads to be used including in the proposed permit area. The applicant is currently formalizing agreements with both the private landowner and Scofield city to use their existing roads during construction. The use agreements will be added to Chapter 1, Appendix 118-A once finalized.

Findings:

In terms of engineering design and details, the road systems and transportation facilities details are sufficient to satisfy Coal Mining Rules requirements.

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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:

A sediment pond will be located at the east end of the Winter Quarters Ventilation facility site. The pond is designed to treat the approximately 3.69 acres of disturbed and undisturbed area associated with the facility. The area under the pond is not expected to subside. The pond will be operated in accordance with WPDES Discharge Permit Conditions. Engineering design specifications for the Winter Quarters Ventilation Facility pond were included with the application. Within Attachment C, the permittee has submitted settling pond design considerations that reference the calculation and analysis of an adequate safety factor (1.3) as per R645-301-533. Soil properties were used as input criterion for *Slide 5.0*, a computer program created by RocScience. Safety factors were calculated through *Slide's* utilization of Bishop's Simplified Method of Slices. The expected minimum safety factor of the proposed sediment pond is 2.75. It is expected that the pond embankment will be stable under anticipated operating conditions. Tables within Attachment C include the geotechnical data as required by R645-301-533.712.

Findings:

In terms of engineering and design specifications, the application meets the Hydrologic Information requirements of the State of Utah R645-Coal Mining Rules.

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:

The application package included maps, plan, profiles, cross sections, etc. for the proposed facilities for the ventilation shaft pad, access roads, operational surfaces, sediment ponds, road and drainage details, retaining walls, and proposed reclamation surfaces. The applicant also included a split cross section of the ventilation shaft with backfill information

Findings:

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(R645-301-512) Within the submittal, the applicant included a schematic cross section of the ventilation shaft as well as a schematic cross section of the mine slope. The schematic depicts the designs for shaft backfill. Neither of the cross sections (Figures 4.9B, 4.9C) appears to have been certified by a qualified registered professional engineer, and there does not appear to be any drawings or cross sections of the escape shaft. There is not enough information provided in terms of maps, drawings, plans, cross sections, etc. of the shafts and slopes to be considered adequate. For purposes of completeness, the applicant should provide a certified map (rather than just a schematic figure within the text) that includes all relevant details pertaining to both shafts and the slope. The map should be complete enough to be certified by a professional engineer. Depictions of the shaft should be split into sections or otherwise presented as to allow for the drawings to be scaled. The applicant stated, "Appropriate maps will be certified when the application is approved and clean copies are provided". The maps depicting the shafts and slope are not yet complete enough to warrant approval.

RECOMMENDATIONS:

Approval will not be recommended until the following deficiencies are addressed

- **(R645-301-512)** Within the submittal, the applicant included a schematic cross section of the ventilation shaft as well as a schematic cross section of the mine slope. The schematic depicts the designs for shaft backfill. Neither of the cross sections (Figures 4.9B, 4.9C) appears to have been certified by a qualified registered professional engineer, and there does not appear to be any drawings or cross sections of the escape shaft. There is not enough information provided in terms of drawings, plans, cross sections, etc. of the shafts and slopes to be considered adequate. For purposes of completeness, the applicant should provide a certified map (rather than just a schematic figure within the text) that includes all relevant details pertaining to both shafts and the slope. The map should be complete enough to be certified by a professional engineer. Depictions of the shaft should be split or otherwise presented as to allow for the drawings to be scaled. The applicant stated, "Appropriate maps will be certified when the application is approved and clean copies are provided". The maps depicting the shafts and slope are not yet complete enough to warrant approval.