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TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

May 3, 2010

TO: Internal File

THRU: James D. Smith, Permit Supervisor *JDS*

FROM: Priscilla Burton, CPSSc, Environmental Scientist III, Team Lead *PWB by SAS*

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

SUMMARY:

Canyon Fuel Company provided drawings and narrative on January 11, 2010 to amend the Mining and Reclamation Plan to include a ventilation facility and escapeway in Winter Quarters Canyon within the North Lease. The soil survey indicates the area to be disturbed is a 25 – 35% slope with a thin surface layer of sandy loam soil (MRP Vol 2., App. A-2). The soil is neutral in pH and has very little carbonate or neutralizing content. The baseline data collection did not include potassium or phosphorus analysis. This information will be collected from the salvaged topsoil. The overburden material to be stored in the pad will be analyzed for acid/toxic parameters with one sample drawn from every 2,000 tons stored on site (Section 4.4.5, p. 4-30 and Section 4.16.2, p. 4-90). The plan describes the use Table 6 parameters, however, the suggested list of analytes are outlined in Tables 3 and 7 of the 2008 Division Guidelines for Topsoil and Overburden Handling and include: pH, EC, SAR, Se, B, and Acid Base Potential.

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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.

GENERAL

Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

Analysis:

The North Lease is in a montane area of elevation 8300 –9300 feet. Slopes are well vegetated with aspen and conifers. Two main drainages (Winter Quarters and Woods Canyon) flow northeast emptying into Mud Creek (or Pleasant Valley Creek). Each drainage has several reaches contributing flow. The gradient of the creeks is gentle along the valley bottom. Winter Quarters Creek has a wide floodplain vegetated with grasses.

There are two seams of interest in the North Lease: the Lower O’Conner “A” seam and the Flat Canyon seam (also called the Woods Canyon) seam in the Blackhawk Formation, which in the North Lease lies in a zone of compression. The compression appears to limit the ground water inflow to the mine.

Findings

The information provided is adequate.

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

Analysis:

The soil survey indicates the 8 acre area to be disturbed is a 25 – 35% slope with a thin surface layer of sandy loam soil (MRP Vol 2., App. A-2). The soil is neutral in pH and has very little carbonate or neutralizing content. The baseline data collection did not include potassium or phosphorus analysis. This information will be collected from the salvaged topsoil, see page 4-34(a).

Findings:

The information provided meets the requirements of the Regulations.

ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320.

Analysis:

Alluvial Valley Floor Determination

The existence of an alluvial valley floor with irrigated pastures and areas of subirrigation along Mud Creek in Pleasant Valley below the Utah No. 2 Mine (now called the White Oak Load Out) was previously established by the Division (1984 Technical Analysis of the Valley Camp Mine, ACT/007/001, and Valley Camp MRP Map R645-301-411.100 Premining Land Use Map). Figure 2.12.D in the Skyline Mine MRP illustrates the locations of pastures downstream and outside the permit area.

Similarly, there exists an alluvial valley floor in the broad, valley bottom of Winter Quarters Canyon and Woods Canyon, outside the permit area (MRP, Section 2.12). Measurements of flows taken on November 26, 2001 (Appendix D, Skyline Mine MRP) recorded 18.4 cfs in Mud creek after the confluence with Eccles Creek and 24.44 cfs after the confluence with Winter Quarters Creek. The gain in flow downstream was attributed to contributions from springs and side streams (2 – 3 cfs) and re-emerging base flow from the alluvium of 3 – 4 cfs (Section 2.12 and Appendix D July 2002 Addendum to the Skyline Mine PHC).

Figure 2.12.D illustrates the locations of pastures in the Alluvial Valley Floor. Table 2.12.3 provides information on land ownership, pasture size, and crop grown. There are six landowners along Mud, Winter Quarters, and Woods Canyon Creeks. The land is used for grazing of pasture grass. All pastures were estimated to produce 2.5 Tons/acre of grass annually (Ray Jensen, Range Specialist for the Bureau of Land Management (BLM) is the source of this yield estimation. He suggested a range of 4000-6000 pounds/acre for sub-irrigated grassland, in 2001.) The predominant vegetation type is grass. Horses and cows graze in pastures (Division observation). The number of animals grazed on the pastures by each landowner is variable with time.

Within the permit area, the sinuosity of Winter Quarters Creek is 1.1 and the channel width varies from 6 – 8 ft. Flows ranged from 108 – 871 gpm during the baseline gathering study period. In Woods Canyon, the AVF is limited to 3 acres and sinuosity and channel width

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were not measured. However the flow ranged from 23 –410 gpm during baseline collection (Section 2.12).

Protection of Agricultural Activities

Mud Creek stream channel vegetation was assessed several times in the last decade as a result of sustained, large flows being pumped from the mine (Appendix A of Appendix D July 2002 Addendum to the Skyline Mine PHC and the July 2004 Mt. Nebo Scientific, Inc report entitled, “Baseline Monitoring Riparian Plant Communities at Eccles Creek & Mud Creek 2002-2003”).

As a result of this monitoring, the Division was able to make a finding (August 2005 Task 2246 Subsidence Mining North Lease), in accordance with R645-302-323.122, that

- Skyline Mine operations had not materially damaged the underground water systems in Pleasant Valley, outside the permit area of the existing coal mining and reclamation operation.
- The increased mine discharge has had no negative impact on agricultural activity along Mud Creek.
- Instability in the channel banks and increased erosion of the stream channel in reaches of the channel that are not well vegetated are very small in relation to the acreage being pastured and are negligible to the total production of the pastures.
- There has been no significant impact to productivity of the pasturelands in Pleasant Valley.
- The quality of the mine water discharge in terms of Total Dissolved Solids has improved with the quantity of water discharged.

In 2005, in accordance with R645-302-324.300, The Division required continued monitoring of the vegetation, erosion of banks, flows and chemical quality of the waters at established locations on Mud Creek, Winter Quarters Creek and Woods Canyon Creek (Sec. 4.11.9). A commitment to armor the Winter Quarter stream channel downstream of the permit area was provided order to establish bank stability, in the event that there is greater than 6,200 gmp (5 fps) discharge from the sediment pond UPDES discharge point (Sec. 2.4-2, p. 2-43a and Section 2.5-2, p. 2-51d).

Monitoring

The MRP describes monitoring of stream flows (Section 2.4) and vegetation (section 2.7) in Woods and Winter Quarters Creeks during and immediately after mining to provide a trigger for implementing the best technology available to mitigate potential subsidence damage

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(Section 4.17). The BTCA for repair of subsidence cracks will be jointly determined immediately prior to implementation (Section 2.7), but will likely involve backfilling with surrounding material and bentonite (Section 4.17).

Scofield Reservoir is a drinking water source for Price, and a premiere cold water fishery in the State. Unfortunately, it has been listed as an impaired water body by the EPA. Of special concern is the concentration of total phosphorus in the reservoir (Appendix E of the July 2002 Addendum to the PHC). A significant source of phosphorus pollution in the Scofield Reservoir are the sediments entering the reservoir delivered by Mud Creek. Consequently, the contributions of mine water to phosphorus loading has been evaluated by the Permittee (Section 2.12 Attachment 3). Monitoring at two sites on Eccles and five sites on Mud Creek included: total flow, TDS, TSS, and total phosphorous, stream morphology. (Station locations are shown on Figure 1 Location of Reference Sites Attachment 3 Land Use of Section 2.12.) Stations are monitored four times a year (seasonally) and will be monitored for a period of one year following a reduction in discharge to a rate of 350 gpm or less. Sediment yield loading from flows in Mud Creek have been computed from the TSS and flow data collected. Annual evaluations of the stream are summarized in a report provided to the Division with the Skyline Mine Annual Report. The monitoring plan also evaluates the changes in stream morphology and vegetation at the stations over the same time period. Total phosphorus has been included in the list of parameters to be monitored on Winter Quarters creek waters.

Findings:

The information provided meets the requirements for protection of the downstream alluvial valley floors.

PRIME FARMLAND

Regulatory Reference: 30 CFR 785.16, 823; R645-301-221, -302-270.

Analysis:

Section 2.14 and Appendix Volume A-2 has a prime farmland determination letter for the area. There is no historical use of cropland within the proposed permit area. The proposed disturbed area has concave slopes at 25 – 35% inclination.

Findings:

The Division concurs with the Natural Resource Conservation Service that there is no prime farmland within the permit area.

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OPERATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

Analysis:

Topsoil Removal and Storage

The plan states in on page 2-120c that one to two feet of surface soil will be salvaged. However the soil survey in App. A-2, Vol 2. suggests that a salvage depth of 6 – 18 inches of sandy loam soil is more likely to be salvaged from 1.6 acres within the 8 acre disturbed area. A stockpile will be constructed on 0.67 acres (ASCA Area 37 described on page 3-72b) and illustrated on Plate 3.2.4-3A. The stockpile area can hold 4,421 cu yds of soil (p. 4-34(a)). The toe of the stockpile is located 25 feet from the perennial Winter Quarters stream channel. It will be placed on a gentle slope that is four feet in elevation higher than the stream channel. The topsoil will be protected by a six inch high berm constructed as shown on Dwg 3.2.4-3E. The size of this berm may not be adequate to withhold runoff. However, the design information for the topsoil berms is provided in Vol 5. Sec 24, Table 3 (p. 21).

Section 4.6.1 of the approved plan describes equipment to be used and protection of topsoil stockpiles. The interim seed mix is described in Table 4.7-8A.

Two composite samples will be taken from topsoil stockpile for analysis of phosphorus and potassium.

Findings:

The information provided meets the requirements of the Utah Regulations.

RECLAMATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

Analysis:

Redistribution

Salvaged topsoil will be redistributed to a depth of 12 inches over 1.6 acres of the 8 acre disturbed area (Table 4.6-4 on p. 4-38c). The remaining disturbed area is either roadway, ditch and catchbasin above the site that will not be reclaimed or 0.67 acre of topsoil storage area or undisturbed buffer zone between the site and Winter Quarters Creek.

The plan describes construction of a pad with underground development waste and the possibility of storing excess underground development waste on the pad (p. 3-31a). Reclamation of the site to approximate original contour will require removal of the retaining wall and fill (p. 4-3a). The overburden material to be stored in the pad will be analyzed for acid/toxic parameters with one sample drawn from every 2,000 tons stored on site (Section 4.4.5, p. 4-30 and Section 4.16.2, p. 4-90). The plan describes the use Table 6 parameters, however, the suggested list of analytes are outlined in Tables 3 and 7 of the 2008 Division Guidelines for Topsoil and Overburden Handling and include: pH, EC, SAR, Se, B, and Acid Base Potential.

As stated in Sec. 4.4.6, pg 4-41e track equipment with low ground pressure will be used to replace topsoil and to roughen the surface. Plate 4.4.2-3A represents the reclamation contours and Dwg 4.4.2-3B shows the cross sections. The cross sections describe a 2h:1v slope.

Findings:

The information provided meets the requirements of the Regulations. The overburden material to be stored in the pad will be analyzed for acid/toxic parameters with one sample drawn from every 2,000 tons stored on site (Section 4.4.5, p. 4-30 and Section 4.16.2, p. 4-90). The plan describes the use Table 6 parameters, however, the suggested list of analytes are outlined in Tables 3 and 7 of the 2008 Division Guidelines for Topsoil and Overburden Handling and include: pH, EC, SAR, Se, B, and Acid Base Potential. A clean copy of the plan might make this correction.

RECOMMENDATIONS:

The application is recommended for approval.