T E C H N I C A L M E M O R A N D U M

Utah Coal Regulatory Program

February 27, 2006

TO: Internal File

THRU: Peter H. Hess, Environmental Scientist/Engineering, Team Lead
Wayne Hedberg, Permit Supervisor

FROM: Priscilla W. Burton, CPSSc, Environmental Scientist/Soils

RE: Topsoil Information, Degasification Wells G-11 and G-12, Canyon Fuel Company, LLC., Dugout Canyon Mine, C/007/039, Task ID #2408

SUMMARY:

Attachment 2-1 of the **Methane Degassification Volume** of the MRP contains baseline survey information gathered from the sites. The well sites G-11 and G-12 were surveyed in June 2005. These sites are located along Pace Canyon Creek in the S1/2 of Sec 20 T13 S., R.13 E (Table 1.1) and together will disturb an additional 3.6 acres (Table 1.2). Total well acreage for degas wells 1 through 12 is 14.35 acres.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

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

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:

Appendix 2-2, Volume 1 of the MRP provides a general outlook on the soils of the Book Cliffs in the vicinity of the Dugout Mine. Figure 1-1 and Plate 1-4 (**Methane Degassification Amendment Volume**) shows the location of the degas wells. Table 1-1 provides locations of the wells and Table 1-2 states each well's acreage. Total acreage for the well sites G-1 through G-12 comes to 14.35 acres (Division calculation).

The specific soils information for degasification well sites G-2 through G-13 is found in Attachment 2-1 (**Methane Degasification Amendment**) of the MRP. (Sites G-1 and G-8 were not developed.)

Baseline soil chemistry information for soils at sites G-2 through G-7 was collected at the time of disturbance (Attachment 2-1), all subsequent sites were surveyed and soil analyzed prior to disturbance. The following parameters were analyzed: texture (particle size analysis), pH, Electrical Conductivity, Sodium Adsorption Ratio, percent $CaCO_3$, plant available Nitrogen, Potassium, and Phosphorus (Section 243). Soil sample analyses are found in Attachment 2-1.

The sites are located at approximately 7,400 to 8,000 ft (see Fig 1-1 and Plate 1.4). The site descriptions, drawings, and photographs are in Attachment 2-1. Some of the sites were previously disturbed by logging (Table 3-1, pg 3-16, Attachment 2-1 section 4.3) or road construction (sites G-11 & G-12).

Sites G-3, G-7, G-10 are classified as Typic Argiustoll soil type (in the Beje-Trag complex map unit in the 1988 Soil Survey of Carbon County Utah).

Sites G-4, G-5, G-6, and G-9 are classified as Pachic Argicryoll soil type (the Midfork-Commodore complex map unit in the 1988 Carbon Co. Soil Survey).

Site G-8 is classified as Typic Ustorthent soil type (Croydon Loam in the 1988 Soil Survey of Carbon County Utah, see Section 222.200 and Attachment 2-1).

Site G-11 is classified as fine-loamy mixed superactive, frigid, Typic Haplustept and Loamy, mixed, superactive, calcareous, frigid, shallow, Typic Ustorthent. The vegetation in the area is pinyon/juniper, sagebrush, serviceberry, and Douglas fir. The slope is 40 - 50% and the aspect is south. The site is located on the toeslope at an elevation of 7,500 ft. A horizon topsoil measures five to six inches at this site. However, the soil consultant estimates that up to 22 inches could be salvaged from the location. Below this depth one encounters either an accumulation of carbonates or lithic contact.

Site G-12 is classified as loamy-skeletal, mixed, superactive, frigid, Typic Calciustoll. The vegetation in the areas is similar to that of G-11 with the addition of ponderosa pine. The slope is 30 – 40% and the aspect is east to southeast. The site is located on the mountain slope with the lower third near the canyon bottom and a stream. The A horizon topsoil extends to a depth of 19 inches, below which a carbonate layer will limit topsoil salvage.

Findings:

The information provided meets the requirements of the Regulations.

OPERATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

Topsoil Removal and Storage

Sites G-8 through G-12:

Site configurations are provided in Attachment 5-1. Disturbed acreage for each well site is tallied in Table 1-2; however, topsoil will not be salvaged from beneath the topsoil storage area. Topsoil salvage areas vary from 0.3 acres at site G-8 to two acres at site G-12. Topsoil removal is outlined in Table 2-1 and Section 222.400 and Attachment 2-2. At sites G-8 and G-9 the surface foot of subsoil/topsoil will be salvaged and stored in a stockpile. An average of eighteen inches is planned for salvage from site G-10. G-11 will average twelve inches of surface removal. At a minimum nineteen inches will be salvaged from G-12 to allow for the replacement depth of 12 – 15 inches at G-12, including the previously disturbed roadway.

Topsoil stockpile volumes are provided in Table 2-1 and approximate dimensions are listed in Table 2-2. Stockpiles are constructed against the slope; therefore, height measurements reflect the original ground surface. Stockpiles for sites G-11 and G-12 will be constructed with 1.5h:1v side slopes (Attach. 2-2**)**. Erosion control methods will include a berm around the base of the stockpile and surface gouging.

Although slopes steeper than 2h:1v have been unsuccessful for establishment of vegetation on stockpiles at other locations, the life of the degasification of well is projected to be less than two years. The Division has weighed the increased disturbance versus the opportunity for plant establishment during operations and agrees that the least disturbance is preferable in this instance. Subsoil will be excavated for use as berms and to create a mud pit at each site (Sec. 231.100, Methane Degassification Volume).

Findings:

The information provided meets the requirements of the Regulations.

RECLAMATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

Degas Well Sites [02/24/06]

The reclamation timetable is shown on Figures 5-15 and 5-26. Unless otherwise specified, sites will be reclaimed in one phase after methane venting ceases. The area will be graded, topsoiled, roughened, seeded, and mulched (see Figures 5-4, 5-8, and 5-12).

The plan describes the reclamation of the drilling mud pits in Section 242.100. The mud pit will be allowed to dry and will be filled with soil that will be compacted to minimize settling. There will be mixing of the cover material with the rock fragments and sediments of the mud pit to avoid creating an abrupt boundary between the layers.

The plan indicates the sites will be ripped to a depth of eighteen to twenty-four inches (Section 242.100 and 341.200) to reduce compaction.

Topsoil will be re-spread using a trackhoe. The soils will be handled when loose and friable (not too wet, not too dry), see Section 242.100. Redistribution thickness is shown in Table 2-3.

Soil Nutrients and Amendments

Soil nutrients and amendments will be applied to the redistributed soils based on analyses of samples collected from the stockpiled topsoil as compared with baseline information.

Soil Stabilization

Soil may be replaced at grades of up to 1.5h: lv (page 5-70). The steepness of these slopes will be reduced at their base, providing a concave slope. Soil stabilization techniques also include ripping the subsoils (see page 2-39), gouging all slopes 3H: 1V or greater after topsoil application (2-40 and 5-76) and hydro mulching the seeded surface (page 2-41 and 3-44 and 3-50). Slopes that are 3h:lv or steeper will be gouged using a trackhoe (page 5-70).

Findings:

The information provided meets the requirements of the Regulations.

RECOMMENDATIONS:

Adequate baseline information has been received for sites G-11 and G-12. The Permittee has indicated in Attachment 2-2 that the topsoil stockpiles will be constructed at slopes greater than 2h:1v.. Although slopes steeper than 2h:1v have been unsuccessful for establishment of vegetation on stockpiles at long term locations, the life of the degasification of well is projected to be less than two years. The Division has weighed the increased disturbance vs. the opportunity for plant establishment during operations and agrees that the least disturbance is preferable in this instance.

The application is recommended for approval.