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# State of Utah

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September 1, 1998

TO: File

THRU: Joe Helfrich, Permit Supervisor

THRU: Daron Haddock, Permit Supervisor

FROM: Robert Davidson, Soils Reclamation Specialist

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RE: Soils Technical Analysis of the MRP Revision for Link Canyon Ventilation Portal and Substation, Canyon Fuel Company, LLC, SUFCO Mine, ACT/041/002-SR98-1, Folder #2, Sevier County, Utah

## TECHNICAL ANALYSIS:

## ENVIRONMENTAL RESOURCE INFORMATION

### SOILS RESOURCE INFORMATION

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

#### **Analysis:**

Chapter 2, Soils, has been amended to allow construction of a proposed breakout/ventilation portal, substation and power line corridor in Link Canyon. The Analysis section discusses resource information as follows:

- Prime Farmland Investigation
- Soil Survey Information
- Soil Characterization

#### **Prime Farmland Investigation**

Appendix 2-1 contains a Prime Farmland determinations for the Quitchupah Lease Tract as performed by the Natural Resource Conservation Service. The Quitchupah Lease Tract includes Link Canyon; therefore, no Prime Farmland exists in Link Canyon.

## Soil Survey Information

An Order-2 soil survey was completed for the proposed Link Canyon breakout and substation disturbed area and is included in Appendix 2-2. The soils for this area are classified as Strych Pathead Podo families Rockland complex with 30 to 80 percent slopes. The complex contains 30 percent Strych soils, 30 percent Pathead soils, 15 percent Podo soils, 15 percent Rubbleland and 10 percent rock outcrops and finer textured soils. Strych soils are 47 inches deep with rooting depths from 40 to 60 inches. Pathead soils are 60 inches deep with rooting depths 30 to 60 inches. Podo soils are thin at 11 inches deep with rooting depths 20 inches or less. *Map unit descriptions are given, but no soils map is provided for the Order-2 soil survey. Therefore, the Division is unable to correlate the mapped soils with the proposed disturbance areas for the breakout and substation pad areas.*

Additionally, an Order-1 soil survey was conducted for the substation pad area and is included in Appendix 2-6. This survey was completed on April 8, 1998 and includes two soil pits with profile descriptions. The investigation was completed by Chris Hansen and Mike Davis of Canyon Fuel Company, LLC and Robert Davidson of the Utah Division of Oil, Gas and Mining. Figure 1 illustrates the Link Canyon soil pit locations (LC-1 and LC-2) for the substation pad area. Both soil pits were hand excavated to 20 inches using a pick and shovel. *For the Order-1 soil survey, the soils were not classified and, therefore, no soils map for the substation area was generated.*

*The limit of the Carbon-Emery Area soils survey ends at the Manti-La Sal National Forest boundary which is immediately below south of the proposed substation pad area as shown on Plate 5-2D. This map, however, does not show range and township identification for accurately locating the proposed site.*

## Soil Characterization

The Order-2 soil survey provides map unit descriptors for soil map unit 20, Strych-Pathead-Podo families-Rockland complex. Soil family descriptions identify taxonomic classifications, parent material, landscape position, slope, vegetation community, profile descriptions, rooting depths, hydrologic information, plus soil erodibility and hazard.

For the Order-1 soil survey, the soil horizons at each sampling location were sampled and characterized according to the State of Utah Division of Oil, Gas and Mining (DOGM) guidelines for topsoil and overburden<sup>1</sup>. Sampled parameters included: soil texture; pH; organic matter percent; saturation percent; electrical conductivity; CaCO<sub>3</sub>; soluble potassium,

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<sup>1</sup>Leatherwood, J., and Duce, D., 1988. Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining. State of Utah Department of Natural Resources, Division of Oil, Gas and Mining.

magnesium, calcium and sodium; sodium absorption ratio, and extractable selenium and boron. Soils in both pits (LC-1 and LC-2) have very similar characteristics, with all parameters in the DOGM acceptable range. Soil profile descriptions are provided and identify the volume and type of rock on the surface and within the soil profile. The A horizon contains 10% rock, principally pebbles. The C1 horizons contain 40 to 45% rock, principally pebbles and cobbles. The C2 horizon for LC-1 contains 50% rock fragments, predominantly cobbles. The surface has occasional boulders with a veneer of pebbles and cobbles.

**Findings:**

The permittee must provide the following, prior to approval, in accordance with the requirements of:

**R645-301-222.100**, Map unit descriptions are given, but no soils map is provided for the Order-2 soil survey. Therefore, the Division is unable to correlate the mapped soils with the proposed disturbance areas for the breakout and substation pad areas. For the Order-1 soil survey, the soils were not classified and, therefore, no soils map for the substation area was generated.

**R645-301-521**, The limit of the Carbon-Emery Area soils survey ends at the Manti-La Sal National Forest boundary which is immediately below south of the proposed substation pad area as shown on Plate 5-2D. This map, however, does not show range and township identification for accurately locating the proposed site.

## **OPERATION PLAN**

### **TOPSOIL AND SUBSOIL**

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

**Analysis:**

The Analysis section discusses operation information for the proposed breakout/ventilation portal, substation and power line corridor in Link Canyon as follows:

- Topsoil and Subsoil Removal
- Topsoil Substitutes and Supplements
- Topsoil Storage

### **Topsoil and Subsoil Removal**

In the Link Canyon Substation disturbed area, the A and C horizons will be removed together and stored on the pad outslope. The A horizon is between 6 to 8 inches deep with the C horizons extending down to 20 inches. Therefore, topsoil and subsoil will be salvaged together to an average depth of at least 19 inches across the site during construction of the Substation pad and access road. In-situ rock, cobbles and boulders, will be left in and on the surface of the side cast soils as resource protection.

### **Topsoil Substitutes and Supplements**

Since the topsoil is thin (6 to 8 inches), the C horizon subsoil will be salvaged with the A horizon topsoil. Based on analysis results for the C horizon subsoils as shown in Table 1 of Appendix 2-6, there are no problems associated with the C horizon subsoils being used as substitute topsoil.

### **Topsoil Storage**

Soils salvaged from the Link Canyon Substation area will be stored on the pad outslope. The outslope stockpiled soil will be protected by placing berms and/or silt fences at the base of the slope. Additionally, the soil will be seeded with the seed mix specified in Section 3.30 of the MRP.

*Topsoil signs need to be placed on the Link Canyon Substation pad outslopes identifying the outslopes as "TOPSOIL." Additionally, since the Link Canyon Substation disturbed area is located within cattle grazing areas of the U.S. Forest Service, the pad outslopes need to be fenced to prevent damage from cattle grazing to the stockpiled topsoil.*

### **Findings:**

The permittee must provide the following, prior to approval, in accordance with the requirements of:

- R645-301-234.200**, (1) Topsoil signs need to be placed on the Link Canyon Substation pad outslopes identifying the outslopes as "TOPSOIL." (2) Additionally, since the Link Canyon Substation disturbed area is located within cattle grazing areas of the U.S. Forest Service, the pad outslopes need to be fenced to prevent damage from cattle grazing to the stockpiled topsoil.

# RECLAMATION PLAN

## TOPSOIL AND SUBSOIL

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

### Analysis:

The Analysis section discusses reclamation information as follows:

- Soil Redistribution
- Soil Stabilization

#### Soil Redistribution

Final reclamation of the pad will include the removal of the substation equipment and replacement of the soils in the pad area. The pre-existing slopes will be restored to AOC using the soil stored in the pad out slopes.

#### Soil Stabilization

*Link Canyon is a steep canyon area with an average rainfall of only 11 inches. Therefore, the applicant needs to provide additional measures and other soil stabilization techniques (e.g., deep gouging) to help assure reclamation success:*

- *alleviate soil compaction*
- *increase soil stability*
- *increase water harvesting*

*Finally, since the reclaimed area is within a USFS grazing unit, the reclaimed slope needs to be protected from grazing (e.g., fencing).*

### Findings:

The permittee must provide the following, prior to approval, in accordance with the requirements of:

**R645-301-242**, The applicant needs to provide additional measures and other soil stabilization techniques (e.g., deep gouging) to help assure reclamation success:

- alleviate soil compaction
- increase soil stability

- increase water harvesting

**R645-301-244**, Fence reclaimed pad, access road, and affected slopes to prevent damage from cattle grazing during reclamation.

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