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December 16, 1997

TO: File  
THRU: Joe Helfrich, Permit Supervisor *JH*  
FROM: Robert Davidson, Soils Reclamation Specialist *RAD*  
RE: Clean Coal Storage Area Expansion, Cyprus Plateau Mining Corporation, Willow Creek Mine, ACT/007/038-97I-1, File #2, Carbon County, Utah

**SYNOPSIS:**

The northern coal storage area is being expanded to support production levels from the Willow Creek Mine. Expansion will increase surface disturbance by 3.9 acres, which will increase the total disturbance acreage from 74 to approximately 78. The original amendment came in on September 29, 1997 with the Division response on December 9, 1997. The second round responding to the Division's review and Technical Analysis was submitted on December 12, 1997. This current Technical Analysis is in response to the latest submittal and addresses the soils issues, of which, there was originally two deficiencies.

**TECHNICAL ANALYSIS:**

**ENVIRONMENTAL RESOURCE INFORMATION**

**SOILS RESOURCE INFORMATION**

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

**Analysis:**

Appendix 8-3 contains the environmental resource information for soils within the clean coal storage area expansion as follows:

- Soil Identification and Description
- Soil Analytical Data
- Soil Sampling Map

### **Soil Identification and Description**

Three sampling sites (CPTP-1, 2, & 3) were located on the hillside east of the clean coal storage area. Shallow trenches were excavated using a backhoe for sites 1 and 2 while site 3 was excavated by hand into an exposed, existing road cut. Soils were logged at each site and samples were collected from each diagnostic horizon. Attachment B contains the field soil logs.

The dominate soil type on slopes adjacent to the clean coal pile is Travessilla-Rock outcrop-Gerst complex<sup>1</sup>. This complex contains 40 percent Travessilla extremely bouldery loam, 30 percent Rock outcrop, 20 percent Gerst very channery loam, and 10 percent other soils. Travessilla soils are found on the north and west aspects at higher elevations on 40 to 70 percent slopes. The Gerst soils are found on south and west aspects at lower elevations on 50 to 70 percent slopes. The Gerst soil is identified as Loamy, mixed (calcareous), mesic shallow Ustic Torriorthents while the Travessilla soil is identified as Loamy, mixed (calcareous), mesic Lithic Ustic Torriorthents. The main difference between these two soils is soil thickness; the Gerst soils are approximately 20 inches thick while the Travessilla soils are thinner at about 10 inches thick. Soil descriptors for *mesic Ustic Torriorthents* are defined as follows:

- mesic - 8 to 15 °C mean annual soil temperature
- Lithic - near stone
- Ustic - dry climate soil moisture regime
- Torr - usually dry
- Orthos - true
- Entisol - recent soil development

Sampling locations, vegetation, rooting depth, and soil-profile descriptions are given for each of the three sample sites. Sampling sites CPTP-1 and CPTP-2 contain deeper soils at 18 and 26 inches, respectively, while CPTP-3 contains shallower soils at 8 inches thickness. As observed in the field, the shallower soils are found on the hillsides while the deeper soils are found at the toe of the slope. Soils are generally loam to sandy loam; rock, mostly gravels and cobbles, increases with depth.

### **Soil Analytical Data**

Attachment C, contains the analytical data sheets for soil samples collected from each of the samples sites, CPTP-1, 2 and 3. Laboratory data are compiled and condensed into Table 1. Each of the measured parameters fall within the acceptable range of the Division's guidelines for

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<sup>1</sup> Jensen, E.H., and Borchert, J.W., 1988. Soil Survey of Carbon Area, Utah Soil Conservation Service, United States Department of Agriculture, Washington D.C.

evaluating topsoil and overburden<sup>2</sup>.

### **Soil Sampling Map**

Attachment A, Figure 1, Soil Sample Locations, shows each of the three sample locations in relation to the expanded clean coal pile.

### **Findings:**

The information provided meets the regulatory requirements of this section.

## **OPERATION PLAN**

### **TOPSOIL AND SUBSOIL**

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

### **Analysis:**

The Clean Coal Pile Expansion amendment, Appendix 8-3, covers the following operational considerations for soil salvage and protection of the soil resource:

- Clean Coal Pile Expansion Area
- Soil Specialist Supervision
- Soil Salvage Considerations

### **Clean Coal Pile Expansion Area**

The maximum extent of the expanded clean coal pile is shown on Figure 1, Soil Sample Locations. The expansion area occupies an additional 3.9 acres. Although Figure 1 shows the coal pile expansion reaching an elevation near 6390 feet, the amendment states that the coal pile will probably only extend to a maximum elevation of 6240 feet.

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<sup>2</sup> Leatherwood, James, and Dan Duce. 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. Salt Lake City, Utah.

### **Soil Specialist Supervision**

The plan states that the actual thickness of soil removal will vary across the area. Based on the limited knowledge provided from the three sampling pits, soil depth may vary from 24 inches at the toe of the slope to less than 8 inches on the slope. Additional soil pits randomly located on the hill would help verify soil thickness variability. *Therefore, because of the extent of the expansion area and the extreme variability of soil quality and thickness, the Division recommended that a non-biased, third party, professional soil scientist be on-site during soil salvage to monitor and supervise soil salvage operations for the purpose of maximizing soil salvage volumes and quantities. Cyprus responded to this recommendation by stating: "... given the experience of Cyprus personnel in the removal of topsoil materials from the refuse disposal area, Cyprus does not believe it is necessary to place this recommendation in the M&RP." To help satisfy the Division's concern for soil variability, Cyprus has verbally requested that the Division's Soil Reclamation Specialist be on-site during soil salvage to help optimize soil recovery across the slope.*

### **Soil Salvage Considerations**

The plan estimates that an average of eight inches of soils will be stripped from the slope. Taking into account the entire 3.9 acres of expansion, an estimated 6,300 cubic yards of soil will be salvaged.

Soil salvage will occur from the slope east of the coal storage area and will be accomplished in stages as the coal pile is enlarged. Soils will be stripped from the slope at least 10 to 15 feet above the maximum level of the coal pile, thus maintaining a buffer zone around the coal pile. Thus, excess areas of the slope will not be unnecessarily denuded while protecting the in-place, undisturbed soils from being contaminated with coal.

The A and C horizons will be stripped from the slope and stored in Gravel Canyon topsoil storage area. The lowermost C horizons ( i.e., Cr, C2r, and C3r) are generally very poorly developed soils and will not be salvaged. No B horizon exists. After removing the larger woody plants, the remaining vegetation will be salvaged and stored with the soils in the soil stockpile.

During expansion, Cyprus commits to salvaging all reasonably available soil.

### **Findings:**

Information provided in the proposed amendment meets the minimum regulatory requirements for this section. However, the following recommendation is given in accordance with:

**R645-301-232.100 and R645-301-232.300.** Because of the extent of the expansion area

and the extreme variability of soil quality and thickness, the Division recommends that a non-biased, third party, professional soil scientist be on-site during soil salvage to monitor and supervise soil salvage operations for the purpose of maximizing soil salvage volumes and quantities. Cyprus responded to this recommendation by stating: "... given the experience of Cyprus personnel in the removal of topsoil materials from the refuse disposal area, Cyprus does not believe it is necessary to place this recommendation in the M&RP." To help satisfy the Division's concern for soil variability, Cyprus has verbally requested that the Division's Soil Reclamation Specialist be on-site during soil salvage to help optimize soil recovery across the slope.

## **RECLAMATION PLAN**

### **TOPSOIL AND SUBSOIL**

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

#### **Analysis:**

Appendix 8-3 references the Mine Reclamation Plan's Section 3.4-6 for final reclamation procedures. Both Appendix 8-3, page 7, and Section 3.4-6, pages 21 thru 22, discuss resoiling of the coal pile expansion slope by committing that topsoil volumes removed and stored in the Gravel Canyon topsoil stockpile will be redistributed on the coal pile expansion slope. Cyprus has stipulated that the actual volume of soil removed and stored will be replaced during reclamation. Cyprus will amend the M&RP after the known volume of soil salvage is known.

Because of the steepness of slope to be reclaimed, Cyprus states that the final slope dressing will be soils with a high percentage of coarse rock.

#### **Findings:**

As determined in the analysis section of this TA, approval of the plan is subject to the following Permit Conditions. Accordingly, the permittee has committed to comply with the requirements of the following Permit Conditions, as specified, and in accordance with the requirements of:

**R645-301-242 and R645-301-120.** Cyprus has committed that the actual volume of soil removed and stored will be replaced during reclamation. Cyprus will amend the M&RP after the known volume of soil salvage is known.