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State of Utah
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DIVISION OF OIL, GAS AND MINING

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TO: File

THRU: Joe Helfrich, Permit Supervisor *JK for Joe Helfrich*

FROM: Robert Davidson, Soils Reclamation Specialist *RAD*

RE: Clean Coal Storage Area Expansion, Cyprus Plateau Mining Corporation, Willow Creek Mine, ACT/007/038-97I, 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.

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 complex¹. 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.

¹ 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.

Each of the measured parameters fall within the acceptable range of the Division's guidelines for evaluating topsoil and overburden².

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 - one recommendation included
- 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

² 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.

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.

Soil Specialist Supervision

The actual thickness of soil to be removed 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 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.*

Soil Salvage Considerations

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 to the permittee 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.

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. However, Section 3.4-6 contains no specifics for reclaiming the coal expansion slope. Appendix 8-3 states that coal will be removed prior to dressing the slope with soils containing a high rock percentage. Appendix 8-3 does not state whether the soil dressing will be in-place soils or soils imported from the Gravel Canyon topsoil stockpile. Furthermore, Section 3.4-6, **Resoiling**, page 3.4-21, states that no soil was salvaged from the Castle Gate site except in the area of the refuse pile. This section states that existing soils at the site will be used as resoiling material except at the refuse pile, where the salvaged topsoil will be used. No mention is given for soils salvaged from, or redistributed to, the clean coal pile expansion area.

Both Appendix 8-3 and Section 3.4-6 need to be correlated and corrected to address reclamation efforts for the coal pile expansion slope. The MRP needs to commit that topsoil materials removed and stored in the Gravel Canyon topsoil stockpile be redistributed on the coal pile expansion slope to the extent possible to achieve reclamation success.

Findings:

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, the permittee must provide the following in accordance with:

R645-301-242 and R645-301-120. Both Appendix 8-3 and Section 3.4-6 need to be correlated and corrected to address reclamation efforts for the coal pile expansion slope. The MRP needs to commit that topsoil materials removed and stored in the Gravel Canyon topsoil stockpile be redistributed on the coal pile expansion slope to the extent possible to achieve reclamation success.