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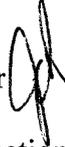
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August 1, 1997

TO: File

THRU: Joe Helfrich, Permit Supervisor 

FROM: Robert Davidson, Soils Reclamation Specialist 

RE: Amendment to Cottonwood Mine Waste Rock Site, Soil Salvaging, PacifiCorp, Cottonwood Mine, ACT/015/019-97D, File #2, Emery County, Utah

**SUMMARY:**

PacifiCorp has submitted an amendment to the Mine Reclamation Plan (MRP) for soil salvaging along the western and northern slopes of the New Waste Rock Site. The Waste Rock Site was constructed in 1990 and is currently being used for refuse storage. The MRP called for topsoil and subsoil to be removed and stockpiled in the immediate vicinity. However, no provisions were made for soil salvage against the western and northern slopes as the refuse was spread and tied into the existing slope. Leveling of the refuse material into the slopes has occurred several times 1990. During an onsite visit by the Division on June 4, 1997, a determination was made that PacifiCorp should salvage and stockpile the slope soils.

**TECHNICAL ANALYSIS:**

**ENVIRONMENTAL RESOURCE INFORMATION**

**SOILS RESOURCE INFORMATION**

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

**Analysis:**

During an onsite visit on June 4, 1997, the Division appraised the west and north slopes for topsoil salvage at the Cottonwood waste Rock disposal site (see Technical Field Visit, June 4, 1997). After testing the soils in the field, soils were found acceptable for use as subsoil and therefore should be salvaged.

The following information is taken from the June 4, 1997 Technical Field Visit:

- MRP Information
- Field Observation

**MRP Information**

The soils are mapped as Lithic Ustic Torriorthents, 5-30% slopes and characterized in the MRP as Pedon #4 as a silty-clay loam having 74% saturation.

**Field Observations**

Topsoil observations were made for the toe of the east-facing hillside slope located immediately above and adjacent to the current Cottonwood waste rock disposal site. Soils are derived from Mancos shale and therefore have a heavy Mancos influence. Vegetation on the southern portion of the slope is mixed with Gardner saltbush, grasses, and sagebrush. Vegetation in the mid portion of the slope is mainly Gardner saltbush with some grass and very little sagebrush.

The soil surface is crusted and cracked with a friable and loose consistency to a depth of about 8 to 12 inches. At this depth, we encountered a hard clay layer with the soil having a

very firm consistency. Soil moisture was present at about 4 to 6 inches.

Two composite samples were taken using a hand held 18" sample probe. Approximately 20, 12" cores were taken for each sample while randomly probing across the midslope at high and low points. The samples were mixed and soil pastes were prepared and allowed to stand for about an hour before making pH and electrical conductivity measurements. Twenty-five grams of soil were used to make the soil pastes and the paste were weighed afterwards to calculate percent saturation. The pH was measured directly in the paste while the EC was measured on the paste extract after filtering thru a Whatman #45 paper. The pH/EC meter was calibrated before making measurements using pH and EC standards.

| Composite Sample | Paste Temp °C | pH  | EC $\mu\text{s/cm}$ | SP % |
|------------------|---------------|-----|---------------------|------|
| south slope      | 80            | 7.6 | 2120                | 37.0 |
| mid slope        | 80            | 7.7 | 2910                | 38.4 |

Per DOGM's soil guidelines, the measured soil parameters for both samples are good for pH, and saturation %, and fair for EC.

**Findings:**

The requirements of this section of the regulations are considered adequate.

## **OPERATION PLAN**

### **TOPSOIL AND SUBSOIL**

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

**Analysis:**

The following reiterates soil salvage operations for the Cottonwood West Rock Site:

- The topsoil will be salvaged during regular lift leveling operations that require the waste rock and refuse material to be placed beyond the existing ditch line and against the western or northern slopes. The topsoil will be salvaged to an approximate depth of 10 inches. The width of removal will be determined by the depth of the refuse to be leveled. The drainage ditch will be reconstructed according to permit requirements.
- Salvaged soil will be utilized as subsoil along the outslope of the containment berm if the berm is under construction. Otherwise, the soil will be hauled and stockpiled in the subsoil stockpile.
- A trackhoe will be used to remove the soil from the slopes. Ten-wheel dump trucks will be used for transporting the soil.
- Large boulders encountered during salvage will be removed and either stored for rip-rap or placed in the refuse pile.
- Drawing CM-10816-WB, Plate 4-4 for the Waste Rock Volume is revised to depict the salvage area.

**Findings:**

The requirements of this section of the regulations are considered adequate.