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September 30, 1987

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FROM: James Leatherwood, Soils Specialist *HL*

Re: MRP Modification Review, Waste Rock Disposal Site, Southern Utah Fuel Company, SUFCO Coal Mine, ACT/041/002, Sevier County, Utah

The above referenced modification received August 3, 1987 has been reviewed and found not to be complete. The following information must be addressed.

UMC 783.21 Soil Resources Information - JSL

The plan does not contain an adequate soil survey and map of the proposed waste rock disposal site. A soil survey and map must be submitted. The survey and map must identify all soil sample sites, phases of soil series and inclusions that are distinctly more limiting for use than the identified soil such as rock outcrops. The map scale should be comparable to the facilities map.

Appendix IV, Vegetation and Soils of the Proposed Waste Rock Disposal Site associates the soils at the proposed waste rock site to the fine mixed frigid Typic Argixeroll soils (map unit D) within the approved permit area. Due to a lack of specific data and a disagreement between the submitted data, the equivalence between these two soils is questionable. Map unit D of the approved PAP list 62.2 ppm Ca, 6.85 pH, greater than one percent organic matter for the upper eleven inches and a median clay loam texture. The waste rock disposal site however list Ca at 7185 ppm, pH of 7.96, organic matter greater than one percent in the upper 38 inches and a median texture of a sandy clay loam. The following must be included in the survey to adequately define the soil type: hydrologic group, slope aspect and percentage, capability subclass, erosion hazard, drainage characteristics, parent material, and water holding capacity.

Table 8 of Appendix A of Appendix IV must be corrected. The soil texture in horizons B21, B22, B3ca and C must be changed from clay loam to sandy clay loam.

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UMC 783.27 Prime Farmland Investigation - JSL

The negative determination of prime farmland is not acceptable. Elevation is not a criteria for prime farmland. According to the limited information presented in the soil survey, the soils at the rock waste disposal site may be classified as a prime farmland. The operator shall contact the U.S. Soil Conservation Service (SCS) to determine if the proposed site soils have been designated as prime farmland. A copy of the SCS determination must be included in the permit application.

UMC 784.11 Operation Plan: General Requirements - JSL

The permit application must include topsoil removal, storage, and redistribution plans for the sediment pond site. The MRP must also include a plan for the disposal of the sediment pond waste at phase II final reclamation.

The applicant must discuss proposed methods and equipment that will be utilized to ensure the proper depth of soil removal. Two possible methods include leaving small islands and a grid staking system at a spacing of 100 to 200 feet. In either case a removal isopach map and topsoil mass balance table based on annual removal, should be included with the MRP. The topsoil balance sheet must be utilized throughout the life of the project to keep a running total of available soils versus disturbed acreage for the purpose of ensuring that adequate soil is available for reclamation.

UMC 784.13 Reclamation Plan: General Requirements - JSL

The mine plan must include a map showing the location of all topsoil stockpiles. The applicant must also clarify the measures that will be employed to achieve topsoil stockpile protection. Section 3.2.3 states that the stockpile will not be revegetated while section 4.4 states that it will be revegetated. The Division recommends that the applicant reseed and establish berms around the perimeter of the stockpiles.

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Methods such as scarification of the waste should be discussed to ensure good overburden contact. The depth of scarification must be at a minimum six inches deep.

Soil redistribution must be carried out when the soil is dry. Working on wet soil results in excessively compacted soil. The redistribution plan states that six inches of topsoil will be top-dressed on the waste site. However the application contains no verification that vegetation success can be met with this minimum cover depth. The suitable depth(s) of topsoil redistribution shall be determined by the quality and depth of overburden, effective length of vegetative root growth and previous topsoil depth.

The physio-chemical nature of the overburden is uncertain. According to Volume 3, Appendix 783.14(a)(2)(iii) and Table 783.14(a)(2)(iii), the overall average percent pyritic sulfur ranges from 0.05 to 2.33 percent. The calculated acid production potential $[(\% \text{ pyritic S})(-31.24)]$ is -21.56 to -72.79. Acid water production will occur in material with an Acid Base Potential (ABP) of -5 or less. To calculate the ABP the neutralization potential (NP) must also be known. The NP $[(\text{CaCO}_3\%)(10)]$ is added to the acid production potential to calculate the ABP. The NP data for the waste material has not been submitted.

The ABP, among other constituents, must be quantified for all underground development waste material. To determine the acid- or toxic- forming potential of the waste the Division proposes that the applicant sample each and every lift prior to backfilling the waste into the proposed waste disposal area. Each sample shall be a composite sample. The Division must receive the data of the specific lift prior to the backfilling of any other underground waste materials into the waste disposal area. All samples must be analyzed for the following parameters to adequately determine the acid- or toxic- forming potential: % pyritic S; $\text{CaCO}_3\%$; selenium; pH; SAR; texture; electrical conductivity; and, Boron. The results of the evaluations should be integrated into the plan to demonstrate that all coal and acid- or toxic- forming material (ATFM) is disposed of in a manner that will prevent environmental degradation. The reclamation plan must include proper disposal methodology if the material is an ATFM. The plan would include sealing the material from oxidation, and/or neutralization of the problem material.

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The reclamation plan must also include compaction mitigation and stabilization plans. The Division recommends tilling one ton of alfalfa hay into the redistributed soil at a six inch depth. Contour furrowing or pitting should also be implemented after soil redistribution.

The fertilization plan must be clarified. Section 4.5 states that 150 lb nitrogen per acre will be applied while section 4.6.4 states that fertilization will be based on soil analysis. A blanket application rate may cause water quality and revegetation problems. Sampling should be accomplished prior to topsoil removal and after soil redistribution. A total of three sample site locations with sample depth intervals of 0-6, and 6-18 inch should be adequate to represent the soil resources. After redistribution the sampling rate should be one sample per 2 acres at a depth interval of 0-6 inches.

The Division recommends that the fertilization rate be established by analyzing each sample for the following soil parameters: texture; electrical conductivity; pH; calcium; magnesium; sodium adsorption ratio; available phosphorus; organic matter, and potassium. A discussion of implements to be used to apply the soil nutrients should be included in the context of the reclamation plan. The Division recommends drilling the fertilizer into the soil approximately one inch below the seeds.

cc: S. Linner

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