ACT/041/002
File #2

0012

STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

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March 30, 1988

Mr. Ken Payne, Manager
Southern Utah Fuel Company
P.O. Box P
Salina, UT 84654

Dear Mr. Payne:

Re: Technical Deficiencies Review, Southern Utah Fuel Company, Convulsion Canyon Mine, Waste Rock Disposal Site, ACT/041/002, Sevier County, Utah

Enclosed is the Division's Technical Deficiencies Review document for the proposed Waste Rock Disposal Site. The technical deficiencies identified herein do not need to be resolved prior to a Determination of Completeness and a public comment period, but a prompt response would speed the permitting process.

Should you have questions, please contact me, or Kent Wheeler, Reclamation Hydrologist.

Sincerely,

Susan C. Linner

Susan C. Linner
Reclamation Biologist/
Permit Supervisor

jr
Attachment
cc: B Team
0028R/79

SOUTHERN UTAH FUEL COMPANY
CONVULSION CANYON MINE - WASTE ROCK DISPOSAL SITE
TECHNICAL DEFICIENCIES REVIEW
ACT/041/002
MARCH 30, 1988

UMC 800 Bonding and Insurance Requirements - JRH

The cost estimate submitted by the operator is considered to be adequate. However, due to technical variations in the proposed plan, a final determination as to the bond amount cannot yet be determined. The primary change in the design of the facilities which will affect the reclamation cost estimate will be the determination of the requirements for cover and topsoil materials over the spoils. Upon final approval of the design for the waste disposal facilities, the bond amount shall be determined.

UMC 817.21 - .25 Soil Resource Management - JSL

Pursuant to UMC 817.48, 817.71(j)(2) and 817.103, the waste material is presently classified as an acid- or toxic-forming material. Because of boron's toxic nature to vegetation, more than 12 inches of soil will be required for final redistribution. A greater depth of soil is required to ensure vegetation success.

The exact amount of topsoil and subsoil required for redistribution cannot be determined at this time. As outlined in the February 2, 1988 correspondence to Southern Utah Fuel Company (SUFCO), the percent roots was not described in the soil profile description. The depth of topsoil and subsoil redistribution is dependent upon this information.

The Division does recommend at this time that a greater amount of soil be removed, and segregated into topsoil and subsoil stockpiles, such that a total of 48 inches of soil will be available for redistribution on the potentially acid- or toxic-forming materials.

In addition, the Mining and Reclamation Plan (MRP) states that the topsoil stockpile near the sediment pond will be reseeded. Please indicate the rate and seed mix that will be used.

UMC 817.42 Hydrologic Balance: Water Quality Standards and Effluent Limitations -KW

The Division accepts the applicant's decision not to install the rain gauge. However, the applicant should be warned that meteorological data from the mine site will not be acceptable for justifying any non-compliance with the performance standards. The 40 CFR, Part 434, specifically states that the operator shall have the burden of proof that any non-compliance was caused by an event greater than the applicable precipitation event.

The waste rock disposal is located in an area where summer storms are typically high intensity and spatially limited in extent. Therefore, the Division will not accept measurements made six miles away as proof of a storm exceeding the design event.

UMC 817.43 Hydrologic Balance: Diversions and Conveyance of Overland Flow, Shallow Ground Water, and Ephemeral Streams - KW

UMC 817.44: Hydrologic Balance: Stream Channel Diversions - KW

The applicant has corrected most of the deficiencies found in the original review document. However, there are still deficiencies which will require revision.

Undisturbed Diversions

The applicant proposes leaving all of the undisturbed diversions in as permanent diversions. This requires designs for the 100yr - 24hr precipitation event. Although the present channels are designed for the 10yr - 24hr event, some of the designs will safely pass the 100yr - 24hr event. The following table outlines the salient features of each channel design and shows which channels are acceptable.

Table 1

WATERSHED CHARACTERISTICS

	Drainage Area (ac)		T_c		CN		Precip (in)	
	DOGM	MRP	DOGM	MRP	DOGM	MRP	DOGM	MRP
Diversion #1	120	121	0.32	0.16	55	55	3.0	2.1
Diversion #2	78	78	0.26	0.10	55	55	3.0	2.1
Diversion #3	0.6	0.6	0.07	NA	90	NA	3.0	2.1

Table 2

PEAK DISCHARGE
(cfs)

	Peak Flow (cfs)	
	DOGM	MRP
Diversion #1	6.9	3.3
Diversion #2	5.2	2.4
Diversion #3	1.2	0.4

Diversion #1 is sized so that the expected peak flows as calculated by the Division will be passed by the culvert and the grassed swale without causing erosion.

The culvert and the splash basin are acceptable for Diversion #2. However, the channel below the culvert will require additional designs. The Division's calculations show that this channel must be 1.3 feet deep to contain the design event.

The designs for Diversion #3 are acceptable except for at the point where the diversion runs down the road bank to the splash basin. This section will require riprap protection.

Deficiencies requiring responses:

1. The reclamation plan needs to address the removal of the culvert extension on Watershed #1. This culvert needs to be removed and the runoff restored to its original channel. Since this channel will not be disturbed during the operation of the waste rock area, no designs of the reclaimed channel will be required.

2. Diversion #2 below the splash basin must be redesigned to pass expected peak flow from Watershed 2 and the road drainage from a 100yr - 24hr precipitation event.

3. The applicant needs designs for riprapping the section of Diversion #3 where it moves off the road bank down to the splash basin at the top of Diversion #2. Division calculations show riprap with a D_{50} of 0.5 ft and 1 foot of filter blanket material (1 in minus road base) should be sufficient.

DISTURBED AREA DIVERSIONS:

The following are the characteristics and peak flows from the disturbed area. Both ditches must be designed to this criteria.

Table 3

WATERSHED CHARACTERISTICS

	Area (ac)		T_c		CN		Precip (in)	
	DOGM	MRP	DOGM	MRP	DOGM	MRP	DOGM	MRP
Disturbed Area	7.02	7.93	0.12	0.42	809	81	2.1	2.1

Table 4

PEAK DISCHARGE
(cfs)

Peak Flow (cfs)

DOGM	MRP
4.59	4.42

As the preceding tables show, the Division's calculations and the applicant's are similar. The applicant has submitted calculations and details for riprapping of Ditch 1 and 2 at all slopes over 4%. These designs are complete and satisfactory. The Division recommends the use of 3/4 inch minus road base as the filter blanket material. Since the ditches are temporary and will be removed during reclamation, the filter fabric does not need to be used if there is a commitment to using 6 inches of the road base gravel.

TERRACE DIVERSIONS:

The reclaimed waste rock area will have small diversions which will keep overland flow from running off the reclaimed areas onto the working area. These diversions will gradually fill with soil and vegetation and naturally heal. Since they are not an integral part of the reclaimed diversion system, they will be sized to convey the 10yr - 24hr precipitation event. Tables 4 and 5 show the calculations for runoff from the largest of the four terraces. All of the terrace diversions will be sized to accommodate this flow.

Table 5

WATERSHED CHARACTERISTICS

	Area (ac)		T_c		CN		Precip (in)	
	DOGM	MRP	DOGM	MRP	DOGM	MRP	DOGM	MRP
Largest Disturbed Area	2.2	2.1	0.08	0.32	90	80	2.1	2.1

Table 6

PEAK DISCHARGE
(cfs)

Peak Flow (cfs)

	DOGM	MRP
Terrace Diversions	1.3	1.2

The Division's values for peak flow are similar to the MRP. The terrace diversions follow the contours of the waste rock; therefore, a slope of 0.01 is assumed. The diversion designs are acceptable using this slope.

UMC 817.46 Hydrologic Balance: Sedimentation Ponds - KW

In talking with Wess Sorenson of SUFCO, it was noted that the elevations of the sediment pond were not correct. However, a technical analysis was completed and the following values were found to be acceptable:

Table 7

SEDIMENT POND DESIGNS

Containment Volume Needed 10yr - 24hr event + 3 Years Sediment Volume.....	25,000 ft^3
Minimum Height Above Pond Bottom for Primary Spillway.....	4.5 ft
Minimum Height Above Pond Bottom for Emergency Spillway.....	5.5 ft
Peak Flow for 25yr - 24hr event.....	7.0 cfs
Depth of Flow in Emergency Spillway for 25yr - 24hr Event.....	0.1 ft
Minimum Height Above Pond Bottom for Top of Embankment.....	6.6 ft

Most of the above values are correct in the MRP, with the exception of the distance between the primary and the emergency spillway.

The designs for the riprap, and stilling basins for the primary and emergency spillway, are acceptable.

Deficiencies requiring responses:

1. The elevations shown in Figure 1 need to be corrected to show a minimum of 1 ft between the primary and the emergency spillway.

UMC 817.48, 817.71(j)(2) and 817.103 Acid- or Toxic-Forming Material - JSL

Based on the limited data presented in the January 19, 1988 submittal, the Division considers the waste material to be acid- or toxic-forming. This determination is based on the water-extractable boron level of 6.13 ppm. According to the Division's Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining, any material with water-extractable boron greater than 5 ppm is classified as an acid- or toxic-forming material.

This determination is based on the one and only sample. The Division recommends further analysis of the material presently stockpiled and for each lift that is derived from an isolated (specific) area of the mine to fully characterize the waste.

UMC 817.52 Hydrologic Balance: Surface and Groundwater Monitoring - KW

The applicant has submitted a preliminary water monitoring program. This program commits to monitoring 17 parameters for a minimum of two (2) years on a quarterly basis. Since no baseline data has been submitted to date, the Division cannot evaluate the proposed program. The final list of parameters may be modified, depending upon the results of the baseline monitoring. Furthermore, any changes in monitoring frequency or parameters must be approved before the change is made.

As agreed upon in the meeting with SUFCO officials, baseline water quality monitoring will proceed through June with monthly water quality measurements. The parameters that will be monitored shall include all of the parameters found in the Division's Water Quality Monitoring Guidelines. After the baseline water monitoring period, it may be necessary to add to, or acceptable to delete, some parameters from the Mining and Reclamation Plan's (MRP) water monitoring parameters list.

Deficiencies requiring responses:

1. The applicant needs to add static water level to the parameters that will be monitored in the field.

2. The MRP needs a commitment to submit the results of the monitoring within ninety (90) days of the end of each quarter.

3. The two monitoring wells drilled in February need to be located on Map 2.

UMC 817.101 Backfilling and Grading: General Requirements - KW

The cross-section labeled "G" in Figure 2 appears to correspond to cross-section F on Map 2. This discrepancy should be rectified.

UMC 817.106 Regrading of Stabilizing Rills and Gullies - JRH

The operator has committed to repair and maintain rills and gullies greater than nine inches in depth. However, under the existing proposal for cover material of only 12 inches, this criteria is not considered to be adequate. In the event that the final design is approved for only 12 inches of cover, the operator shall be required to maintain rills and gullies deeper than 6 inches. Nine-inch gullies would only allow for 3 inches of cover over the spoils material.

In the event that the final design for cover material over the spoils materials exceeds two feet, the operator would then be allowed to maintain rills and gullies at the nine-inch depth criteria.

UMC 817.111 Revegetation: General Requirements - LK

Section 4.6.1 (page 39) of the plan indicates seeding will be done using broadcast seeding methods (cyclone spreader). However, Table 4.6.1-1 states that seed application will be by drilling. This discrepancy needs to be

corrected. Please note, the seeding rate listed on Table 4.6.1-1 is acceptable for drill seeding, but would need to be increased if broadcast seeding is used (please refer to UMC 784.13(b)(5)(iii)).

UMC 817.113 Revegetation: Timing - LK

The application does not identify a timetable as to when each major step in reclamation will be completed (i.e., grading, topsoiling, fertilizing, seeding, mulching, etc.) (Please refer to UMC 784.13(b)(1) and UMC 784.13(b)(5)(i)).

UMC 817.114 Revegetation: Mulching and Other Soil Stabilizing Practices - LK

Regardless of the slope, wet (wood) fiber mulch needs to be anchored with a chemical tackifier. The plan needs to identify this, as well as the rate of application. Usually on level areas, a minimum of 50 lbs. of tackifier per 2,000 lbs. of mulch is applied (Please refer to UMC 784.13(b)(5)(iv)).

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