



State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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TO: File

FROM: Jess Kelley, Reclamation Engineer *JK*

RE: Review of Material Submitted to Satisfy Stipulations #6, #7, and #8 from Construction of the Tank Seam Road, Bear Canyon Mine, Co-Op Mining Company, ACT/015/025-941, Folder #2, Emery County, Utah

SYNOPSIS

The Tank Seam Road connects the Upper Storage Pad with the portal pad of the new Tank Seam operation. The road and pad were approved by the Division in July of 1994 and built by the permittee later the same year. The Division, however, attached 8 stipulations to the approval.

On December 13, 1994, the permittee submitted material to fulfill the requirements of stipulations #6, #7, and #8. In the original approval document, these stipulations read as follows:

6. The Operator must expose bedrock when needed to ensure that the slope is stepped prior to placing fill for construction of the road.
7. The Operator must test fill material prior to placement in order to determine its strength and cohesion characteristics.
8. The Operator must submit detailed slope profiles and stability analysis for each fill slope.

ANALYSIS

The permittee hired the consulting firm of Dames & Moore of Salt Lake City to make the required analyses of the fill slopes. A copy of the final Dames & Moore report is included in the December 13 submittal.

The permittee provided Dames & Moore with detailed slope profiles and fill material samples from 5 locations--designated TSF-1, TSF-2, TSF-3, TSF-4, and



TSF-5. Dames & Moore performed sieve analyses and direct shear tests in order to determine the engineering properties of the fill material. Dames & Moore then used this information to computer model the fill slopes and, using a two-dimensional, limit equilibrium stability program called PCSTABL6, to assess their stability. For all slopes, this assessment assumed the fill material to be fully saturated. Tests on the material from TSF-3 yielded questionable results, so Dames & Moore repeated the tests and designated the results "TSF-6."

The minimum stability safety factors determined by Dames & Moore for the 5 slopes range from 1.33 to 2.65, with the average being around 1.5. As might be expected, the lower safety factors were found in the longer slopes. All, however, were found to be above the minimum regulatory requirement of 1.3. The Dames & Moore study, therefore, fulfills the requirements of stipulations #7 and #8.

The fill slope profiles provided by the permittee show the foundations of the fills being cut to bedrock and stepped, as required by stipulation #6. In addition, this writer visited the site twice during the construction of the Tank Seam Road--once on September 1, 1994 and once on November 10, 1994--in order to observe the road construction and insure that the fill foundation was being cut to bedrock and otherwise prepared properly. On both occasions, he found this to be the case. The requirement of stipulation #6 has thus also been fulfilled.

FINDINGS/RECOMMENDATIONS

The December 13, 1994 submittal fulfills the requirements of stipulations #6, #7, and #8. It is recommended that the submittal be approved and included in the plan and that the Division note that these 3 stipulations have been fulfilled.

cc: Daron Haddock
Pamela Grubaugh-Littig
TNKSM94i.STP