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State of Utah

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DIVISION OF OIL, GAS AND MINING

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May 25, 1994

Memo to: File

Memo from: Scott Milovich *SM*

RE: Erosion Gully Abatement NOV N91-26-8-2, Hidden Valley Coal Co., Hidden Valley Mine, ACT/015/007, Folder #2, Emery County, Utah

Synopsis

The operator has proposed (12/14/92) to convert several erosion gullies to drainage control structures. Although the NOV regarding the gullies has been vacated by the Utah Court of Appeals, the operator is willing to proceed with the abatement plan as a good faith effort to control erosion on the site. The conversion to drainage control structures will be achieved by shaping the gullies to stabilize them and installing a series of porous fiber check dams along the outfall channels.

ANALYSIS

The abatement plan loosely describes the channels to be repaired as varying in depth, width, and length. Tom Munson and Bill Malencik from the Division measured five channels on 3/10/92. The channels range in depth from 16" to 62" and in width from 30" to 15'. Channel length ranges from 19' to 54'. Channel slope taken from the site map and from Mr. Munson's observations range from 1:1 to 6:1.

The design event for a permanent reclamation diversion is a ten year six hour storm (R645-301-742.333). For this site that amounts to 1.2" of precipitation. To determine whether the gullies/diversions are capable of handling that storm calculations were run using the worst case scenario: maximum slope, minimum channel dimensions, maximum length, and maximum contributing area. Based on these calculations peak flow for the design channel would be 2.7 CFS. The gullies/diversions described by the operator and the division staff do not fit neatly into any of the common channel design configurations, so calculations were ran using trapezoidal, rectangular and parabolic cross sections. The calculations gave a range of capacities from 100 CFS to 600 CFS. This would seem to indicate that the gullies/diversions would easily convey the required 2.7 CFS. However, because of the steep slopes on the site the flow velocity even for the required 2.7 CFS in these channels is super-critical: Froude Number = 5+. The fiber check dams



proposed by the operator may reduce this number to a more acceptable level if they are (or can be) maintained in the channel.

From an inspection standpoint this proposal may cause future difficulties. If the channels continue to erode (which is likely based on the calculations) and become larger in any dimension, there may be a potential violation for failing to maintain the channel as designed. If the channels silt in as described by the operator there may be a potential violation for failing to maintain the channel as designed. The compliance question then is whether the regulations provide the flexibility required for a dynamic channel such as this.

Recommendations

The proposal meets the regulatory requirements for reclamation diversion of miscellaneous flow. The plan should be approved without conditions.