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

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October 19, 1993

TO: File

THROUGH: Daron Haddock, Permit Supervisor

FROM: Steven M. Johnson, Reclamation Specialist SMJ

RE: Alternate Topsoil Borrow Areas, U. S. Fuel, Hiawatha Mines, ACT/007/011-93B, Folder #2, Carbon County, Utah.

SUMMARY

Topsoil will by used from areas near the reclamation site for the reclamation of a refuse pile at the Hiawatha Mines. The act of moving this topsoil will create a disturbance that must be properly treated to minimize degradation to the hydrologic balance. The plan for the alternative topsoil borrow areas, Areas E and F, includes the designs for construction of two sediment ponds. These ponds will be placed one in Area E and one in Area F. Area E is located in the flood plain of a perennial stream as are Areas B, C, and D. Ditches will also be built to route flow from up-slope undisturbed areas around the disturbances and sediment pond in both Area E and Area F.

ANALYSIS

R645-301-120 Permit Application Clear and Accurate

Proposal:

Maps of the proposed topsoil borrow areas and surrounding land forms were included to show location of the disturbances and the proposed hydrologic facilities.

Analysis:

The maps showing the areas to be disturbed, the ditches and the sediment ponds are hard to read and incomplete. It is hard to differentiate between ditches and disturbed area boundaries. It appears that some ditches come to an abrupt end and do not flow into another drainage. The sediment pond in Area F appears partially inside and partially outside of the disturbed area, and there seem to be a ditch flowing through it. The orientation of the map is not apparent.

A formula used for calculating the riprap size of spillways and channels is included as E.P.A., 1976. No other information is given on this reference source and its validity can not be determined.

Deficiencies:

1. The maps should be made clearer. The route of each designed ditch should be drawn in the exact position as it will be constructed and it should be shown in its completeness from top to bottom. The exact boundary of the proposed disturbed areas and the location of sediment ponds should be displayed on the maps. A key may be helpful in clarifying location of different features. Orientation of the map should also be shown by indicating direction.

2. Give complete reference for all literature used.

R645-301-731.600 Stream Buffer Zones.

Proposal:

Borrow Area E is to be located within 100 feet of Miller Creek.

Analysis:

Miller Creek is a perennial stream, and no disturbances may occur within 100 feet of a perennial or intermittent stream with out special authorization by the Division. Prior to authorization of this type it is required that it be shown that disturbance in the buffer zone will not contribute to violation of applicable Utah or federal water quality standards and will not effect water quality or quantity or other environmental resources. No such information is supplied in the current proposal.

Deficiencies:

1. Supply information showing that the disturbance of Borrow Area E will not adversely effect water quality, water quantity, or the hydrologic balance of Miller Creek. If this information is unavailable or not achievable choose a suitable alternative location outside of the stream buffer zone.

R645-301-742.220 Sedimentation Ponds.

Proposal:

Sediment ponds were proposed at each borrow area for the purpose of sediment control. These ponds were designed to contain the runoff of 10-year, 24-hour storm event plus 0.1 acre-feet/acre of sediment storage. Each pond will have a

designed decant to remove standing water and a spillway that is design to pass the peak of the 25-year, 6-hour storm event.

Analysis:

The designs for the sediment ponds and spillways are incomplete and in some cases contradictory. It is not show at what levels the maximum sediment content and the design storm would fill the pond. The decant elevation of the Borrow Area E pond is not given. A different slope is used for the spillway in the spillway size design and the riprap size design for Borrow Area F. The calculations for determining these slopes were not provided. The sources for the Manning's n values and curve numbers is not provided, either.

A discharge of 9.93 cfs was used in the design of Area F sediment pond inlet channel (Items 3-B and C). The reference for this flow was Item 3-A in this section; however, this was incorrect and it is assumed that the proper reference should be to section 2-A, which shows a discharge of 23.2 cfs as the proper design flow. A reference to Item 4-B in Item 3-C is also incorrect, and assumed that Item 3-B is the correct source for the hydraulic radius and wetted perimeter.

Normally the estimate of 0.1 acre-feet/acre is use for sediment accumulation over a one year period; however, the time frame for sediment accumulation in these ponds is not specified. Assuming that this is an annual rate the ponds would require sediment removal each year.

From the maps provided it appears that both the decant systems and spillways at each site discharge water onto flat ground. There is no sign of any type of channel that will allow for the water to pass without erosion problems.

Deficiencies:

1. Show the elevations that the total sediment volume and the design storm event would fill the sediment ponds. Show, also, the elevation of structural features, such as decant devise and spillway.

2. Accurate sources of slopes, curve numbers, and Manning's n values should be give, and the values should be used properly and consistently.

3. Accurately reference all discharges and use proper values.

4. A commitment must be made to clean sediment from the ponds every year, or increase the amount of sediment storage in the ponds. (The Division recommends that a minimum of three years of sediment storage be designed in new ponds.)

5. All spillways and decant systems must discharge into a natural or designed channel that are protected against erosion.

R645-301-742.300 **Diversions.**

Proposal:

Two diversions are proposed to route undisturbed flow around the disturbance in Borrow Area E. This site will also have a collector ditch that will route water from the disturbed area into the sediment pond. This ditch will prevent water from leave the disturbed area without treatment. An inlet channel will bring water into the sediment pond.

The plan for Borrow Area F is to route the drainage off the undisturbed area up slope from the borrow area around the disturbance. This flow will be handled by one ditch on the north side of the disturbance and one on the south. There is no plans to build a ditch within the disturbed area, but there will be a inlet channel in the pond to collect water.

Analysis:

All diversions were designed for the 10-year, 24-hour storm event, except the sediment pond inlet channel which was designed for the 25-year, 6-hour event. The 10-year, 24-hour storm event, in general, returned lower peak discharges than the 10-year, 6-hour storm event that is required.

Deficiencies:

1. Temporary diversions should be designed for the 10-year, 6-hour storm event.

RECOMMENDATIONS

The plan for Borrow Area F is to route water from the up slope disturbed areas around the disturbance. This does not seem necessary, because the designed ditch would transport a peak discharge of much less than 1 cfs. It would seem reasonable to investigate increasing the size of the sediment pond and routing undisturbed water into the pond. This could be a minor adjustment to the pond and would eliminate a need for undisturbed drainage diversions.

All peak flow calculations were made using the SCS type B distribution. The SCS type 2 distribution is more acceptable because it returns a more accurate peak discharge value. Recalculating peak flows using the type 2 distribution would provide a greater level of confidence in these designs.