

December 23, 1985

TO: Technical File

FROM: Dave Cline, Reclamation Hydrologist
Rick Summers, Reclamation Hydrologist

RE: Proposed Drainage Control Modifications, Hardscrabble Canyon, November 14, 1985, Price River Coal Complex, ACT/007/004, Carbon County, Utah

Summary: Price River Coal Company submitted modification plans for drainage control in Hardscrabble Canyon as a result of Permit Condition #2 from the Office of Surface Mining. Condition #2 states:

The applicant shall either complete reclamation of Goose Island by August 31, 1985, and Hardscrabble Canyon and Sowbelly Gulch by December 31, 1986; or complete installation of culverts specified below according to design approved by OSM August 31, 1985 at Goose Island and by December 31, 1986 in Hardscrabble Canyon and Sowbelly Gulch. Designs for the new culverts (structures) shall be submitted to the regulatory authority for approval within ninety (90) days of permit approval. The specific structures included are: culverts 1 (including diversions D-1, D-4, and D-6) and cuverts 3 and 10 in Sowbelly Gulch.

The Division has completed its review of the Proposed Drainage Control Modifications in Hardscrabble Canyon and has found this submittal to be deficient. A complete technical analysis could not be performed because the submittal is not considered to be complete at this time. Additionally, this submittal did not address the culverts in Sowbelly Gulch as required by Condition #2. Therefore, the Price River Coal Company will be required to resubmit the drainage control modifications in Hardscrabble Canyon in order to address the following comments. Price River Coal Company must also submit designs for culverts 3 and 10 in Sowbelly Gulch in order to meet the requirements of Condition #2.

Review: The Proposed Drainage Control Modification in Hardscrabble Canyon provided is not adequate to meet the requirements for diversion design as required by the Regulations. In order to perform a technical review of the modification plan the following design criteria must be submitted:

1. The proposal must contain a map of all diversion structures being modified or being affected by the modifications of diversions. The map should clearly depict the topography of the area and all diversions should be labelled and referenced to in the text. Additionally, the plan view of diversion D-6 on Exhibit 3.3-11 must be correlated and referenced to this map.
2. The proposal must contain a watershed map that clearly delineates each sub-watershed in Hardscrabble Canyon. The map must depict each area draining to each diversion or structure, the controls (i.e. topographic, berms, etc.) that delineate the area, disturbed and undisturbed areas, the location of each diversion, and be of sufficient topographic scale to determine elevation change and hydraulic length.
3. The curve number for each sub-watershed must be justified. The November 14, 1985 submittal states that the curve numbers were developed using the methods outlined in the National Engineering Handbook, Section 4 - Hydrology (SCS, 1972). However, the variation in curve numbers for each sub-watershed is unclear and input parameters for each sub-watershed should be presented (i.e., soil type, ground cover type, and ground cover density).
4. The submittal must contain designs for the channel proposed to replace culvert C-3. The design must demonstrate the capacity to convey the runoff from the contributing watershed for a 10 year-24 hour precipitation event.
5. The proposal must contain designs for the reclamation of the channel in the vicinity of culvert C-2 after removal. These designs must include expected peak flow values, velocities and designs for channel stability measures.
6. The proposal must contain exit velocities and designs for energy dissipators for culverts C-1, C-2, C-4, C-5, and the replacement culvert for C-3.

7. The proposal must contain designs for the inlet conditions present at the replacement culvert for C-3. Because the inlet of this culvert is located at an approximate 90 degree angle from the direction of flow in diversion D-3, designs for the inlet conditions will be required to determine the potential for erosion in this area and the adequacy of the culvert to pass the design flow.
8. The proposal must contain designs to demonstrate that each proposed channel will be stable at the design flow. Due to the large peak flow expected for diversion D-6 (368 cfs), a filter blanket will be required for the riprap design.
9. Discrepancies exist between Table 7-13A and Table 7-14A concerning the size of the sub-watersheds. These discrepancies must be clarified.
10. The HEC-2 computer output presented in the November 14, 1985 submittal must be clearly labelled and all computer code designations must be defined. A narrative of the conclusions drawn from the computer run must be included in the submittal.
11. Paragraph 1 Section 3.3-3(1) states that culvert C-1 has been evaluated and is adequate to pass the 10 year, 24 hour storm. However, paragraph 4 in the same section states that culvert C-1 is not adequate to pass the additional flow from the relocation of culvert C-3. This discrepancy must be clarified.
12. Upon final approval of the designs, the applicant will need to update the MRP (including all applicable maps of Hardscrabble Canyon) to reflect the changes in the drainage plan and site layout.

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cc: Lowell P. Braxton
Sue Linner
Tom Wright