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# State of Utah

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TO: Daron Haddock, Permit Supervisor

FROM:  Priscilla Burton, Senior Soils Reclamation Specialist

RE: Crandall Canyon Reclamation Plan. AMAX Coal Co. Castle Gate Mine.  
ACT/007/004. Carbon County. Utah. Folder #2.

## SUMMARY:

Crandall Canyon mining and reclamation plans (section 3.7) were received 9/20/91. The canyon encompasses 28 disturbed acres. A paved access road ((40' wide) will remain from the entrance of the site to the lower bathhouse site. The leach field and associated topsoil will not be redisturbed. The disposition of the substation at final reclamation is not specified.

Reclamation designs do not agree with the narrative, concerning the backfilling of the excavated shafts with 26,000 yd<sup>3</sup> of excess spoil. Excess spoil remaining on the site must be characterized for its acid/toxic forming potential.

A replacement cover depth of 6" is indicated on page 40, para 6. The location of the topsoil to be utilized is not clear as topsoil has been salvaged, stored and relocated over time (page 14, Sec 3.7). Changes to the Castle Gate reclamation plan (9/8/92) affect the availability of topsoil for reclamation of the Crandall Canyon site.

## TECHNICAL ANALYSIS:

**R645-301-122.** referenced materials will either be provided to the Division by the applicant or be readily available to the Division.

### Proposal:

Omissions in the MRP are outlined below.

### Deficiencies:

1. Figure 3.7-4(4)B mentioned on page 36, Section 3.7-4(3) could not be found with the mining and reclamation plan.

2. An incomplete reference list is found on page 35 of the MRP. Missing are citations noted on page 21 and 24 of Section 3.7.

**R645-301-242**      Topsoil redistribution

Proposal:

The plan calls for a topsoil cover depth of 6". Page 20, Sec 3.7-4(1) indicates that in the lower two piles at the mouth of the canyon, there is 18,000 yd<sup>3</sup> stored; that the upper pile no longer exists; and, that 40,000 yd<sup>3</sup> have been transferred to Gravel canyon for storage. A revision (9/8/92) of the Castle Gate Preparaton Plant reclamation plan details the use of 96,000 yd<sup>3</sup> of topsoil stored in Gravel canyon for the reclamation of the Schoolhouse Canyon refuse site.

At the outset of Section 3.7, the area of disturbance is said to encompass 28 acres.

To ensure that adequate topsoil is available for a 6" final cover depth over the disturbed areas in Crandall Canyon, a discussion of the total acreage to receive topsoil and the volume of topsoil available within the disturbed area should be provided in the narrative.

Deficiency:

1. a. The total acreage to receive topsoil coverage should be specified.
  - b. The source of the topsoil for coverage of 6" needs to be clarified due to recent permit amendments.
  - c. A tally of the volume of the material stored in each location should be provided and the resultant coverage over the site determined.
2. Topsoil material from the leach field area should be utilized for redistributed over the site.

**R645-301-242.130.** Protects the materials from wind and water erosion before and after seeding and planting.

Proposal

The plan calls for seeding and mulching "during the first appropriate season following grading and resoiling" following grading.

Deficiency:

If more than one month's time passes between topsoiling and seeding/mulching operations,

mulch should be applied to the topsoil.

**R645-301-242.200.** Before redistribution of the materials removed under R645-301-232 the regraded land will be treated if necessary to reduce potential slippage of the redistributed material and to promote root penetration. If no harm will be caused to the redistributed material and reestablished vegetation, such treatment may be conducted after such material is replaced.

Proposal:

Scarification of the regraded site was not specified in Section 3.7-5(3). A plan which includes deep ripping of the pad areas will leave the seed bed rough, improving water infiltration and sediment control.

Deficiency:

The plan must indicate that ripping or scarification of the regraded spoil will occur to a depth of 18-24 inches prior to the application of borrow soils or hydroseeding.

**243. , Soil Nutrients and Amendments.**

Proposal:

Page 41 of Section 3.7 indicates that soil amendments will be added according to tests described in paragraph 6. These tests are utilized to determine the acid/toxic nature of substitute topsoil are not useful for determining fertilization levels. Paragraph no.6 should indicate that fertilizer levels will be determined after testing for nitrate-nitrogen, phosphorus, and potassium.

Deficiencies:

Testing of the regraded spoil for fertilization requirements (1 sample/ 2.5 acres) must be included in the reclamation plan to comply with this section of the Division Order.

**R645-301-731.311.** Identifying and burying and/or treating, when necessary, materials which may adversely affect water quality, or be detrimental to vegetation or to public health and safety if not buried and/or treated;  
and

Proposal:

The pad areas in Crandall Canyon were constructed of overburden excavated from the shafts. As presented in Table no. 1 of Appendix 3.7C, the chemical analysis of drill hole MC-207 indicates that the Castle Gate sandstone encountered in shaft excavation is acidic, with a pH of 4.3. (The method used was titration.) According to the reclamation plan (pg 40, para 3 and Table 3.7-9 on pg 53) approximately 34% of the spoil generated from shaft development will be returned to the shaft upon final reclamation. However, the reclamation designs do not reflect this utilization of the material. Designs show little regrading of the remaining material 76,168 yd<sup>3</sup>. All of this excess spoil is shown graded and covered with 6 inches of topsoil on Plates 3.7-9 (a-f).

Appendix 3.7C provides some analyses of the excess spoil. Further sampling of the excess spoil after return of 34% to the shafts should be conducted to ensure compliance with R645-301-731.311. Of particular concern is the low pH Castlegate sandstone which was the second strata encountered in the shaft. Once the nature of the excess spoil remaining on the surface has been identified, contingency plans can be developed (if necessary) prior to the onset of final grading.

The methods used by the laboratory to produce the information in Appendix 3.7c are unclear. For instance, salinity is reported as a percentage. Therefore, it is recommended that a complete suite of the Table 6 parameters (from the Division's 1988 "Guidelines for Topsoil and Overburden Management") is conducted on the top four feet of excess spoil material to remain at the site.

Deficiency:

1. Reclamation designs and narrative must agree upon the return of 34% or approximately 26,000 yd<sup>3</sup> of the excess spoil material to the excavated shafts.
2. a. A field sampling program of the Crandall canyon site should be undertaken to determine the nature of the top four feet of material remaining in the location of the office/bathhouse, parking lot, intake at shaft area and exhaust shaft and sewage pumping station (as specified on page 5, Section 3.7-3(1) after return of 34% of the excess spoil material to the shafts.
2. b. This sampling should include a minimum of three depth segregated samples (0-12", 12-24", 24-36", 36-48") for each of the three pad areas shown on Ex 3.7-5, a total of 36 samples. Samples from each location and depth should be analyzed according to Table 6 of the "Guidelines for Management of Topsoil and Overburden," a 1988 Division pamphlet.

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**CONCLUSION:**

Excess spoil which will be regraded on the site during final reclamation should be sampled to ensure compliance with R645-301-731.311 (utilizing Table 6 of the Division's "Guidelines"). A contingency plan should be developed for the burial of spoils with an acid/toxic forming potential.

The total disturbed area for Crandall Canyon is 28 acres. Crandall Canyon reclamation will require the use of topsoil stored in the location of the leach field/water tank as well as the topsoil located at the mouth of the canyon. All topsoil should be sampled for fertility parameters.

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