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

Michael O. Leavitt  
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May 11, 1993

Mr. Richard H. Allison, Jr. P.E.  
Project Supervisor  
AMAX Coal Company, Belle Ayr Mine  
P. O. Box 3005  
Gillette, Wyoming 82717-3005

Dear Mr. Allison:

Re: Approval of Chapter IX Revegetation Plan, AMAX Coal Company, Castle Gate Mine, ACT/007/004-92E, Folder #3, Carbon County, Utah

The Division has completed a review of amendments to your Mining and Reclamation Plan dealing with revegetation at the Castle Gate Mine. The submittals, received to date, have now completed the revegetation plan and Chapter IX is hereby approved. Please refer to the enclosed technical memo by Paul Baker, which provides further analysis of your plan.

Thank you for your help in completing this action.

On a separate but related item, Paul discovered another deficiency in the previously reviewed Castle Gate Area Submittal. This deficiency deals with using the appropriate reference area for areas that were disturbed after 1977. Please refer to the technical memo dated May 10, 1993. AMAX needs to propose a revegetation standard for success for areas of the Prep Plant area that were disturbed after 1977. Thank you for your cooperation in resolving this matter.

Sincerely,

A handwritten signature in black ink that reads "Daron R. Haddock".

Daron R. Haddock  
Permit Supervisor

Enclosure

cc: P. Baker  
CHAPIX.AMA





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TO: File

THROUGH: Daron Haddock, Permit Supervisor

FROM: Paul Baker, Reclamation Biologist *PAB*

DATE: May 7, 1993

RE: Revised Chapter IX, AMAX Coal Co., Castle Gate Mine, Folder #2, ACT/007/004, Carbon County, Utah

## SUMMARY

AMAX has submitted a revised version of the Chapter IX revegetation plan which includes a map showing AML reference areas in Spring Canyon and Price Canyon. There have been a few changes to the erosion control standard for success and to the reclamation plan.

## ANALYSIS

**R645-301-341**

**Reclamation Plan**

### Proposal:

Previously mined areas and small disturbances will be planted with Species List 1. Those areas disturbed after 1977, primarily Crandall Canyon, will be revegetated with Species Lists 2 and 3 as appropriate. When the species shown in the species lists are not available for planting, substitution of an equivalent native species will be made and reported to the Division.

Seed will be applied with a drill, hydroseeder, or by broadcasting. Following seeding, the seeded areas will be mulched or other soil stabilizing practices will be used to ensure vegetation establishment. Tub mulching will be used except where it is not practical or where hydroseeding is the method of seed application. Other materials may be used if shown to be appropriate.

No irrigation or pest or disease control is anticipated, but transplants will be watered on a case-by-case basis to minimize drought kill. If pest control becomes



necessary, a plan will be developed with Carbon County Weed and Pest.

The Motyka Index will be used as the index for comparison for diversity, seasonal characteristics, permanence, and utility for the postmining land use between reclaimed and reference areas. Six life form categories will be used in the comparison. Absolute cover will be used to compute the Motyka Index. The standard for comparison between reclaimed and reference areas will be the percent similarity calculated between samples within the reference area or 70%, whichever is less, unless otherwise approved by the Division.

SMCRA areas will be measured in accordance with R645-301-356.100 through 233. Reference areas for these areas are identified in the specific sections giving the reclamation plans for those areas.

Revegetation success for previously mined areas will be measured in accordance with R645-301-356.250. The AML reference areas shown on Exhibit 9-6 will be used to evaluate these areas. Suitable measures of erosion [control] will be established in consultation with the Division, and such measures will be employed upon approval. Until suitable measures of erosion [control] are established, areas of active erosion and their remediation will be evaluated with the agency on a case-by-case basis.

**Analysis:**

The primary concern with the plan has been the revegetation standards for success. The conditions that were encountered in reclaiming the AML reference areas are similar in many respects to the conditions that will be faced in final reclamation in the previously mined areas to which they will be compared.

In the fall of 1992, cover by life form was measured by the Division in portions of the AML reference areas. This data indicates that these reference areas are suitable as a standard for judging revegetation success. The data compares favorably to potential vegetation for the Pathead-Curecanti family association indicated in the Soil Survey of Carbon Area, Utah published by the Soil Conservation Service. This soil group is the major one in the area. Less prevalent is the Travesilla-Rock outcrop-Gerst complex, and there are fewer shrubs and more grasses in the AML sites than the SCS states is the potential vegetation for this soil group.

One problem with using the AML reference areas is that they have been revegetated and the SCS does not normally conduct site condition ratings for seeded areas. The Division's "Vegetation Information Guidelines" require that a reference area be in fair or better condition according to SCS guidelines at the time of bond release comparison. Although it will not be possible to make precise comparisons of the AML

reference areas to the appropriate SCS range sites, general comparisons of the productivity of similar species using the SCS methodologies can be made and the conditions rated.

The plan does not discuss a specific method to be used to evaluate erosion control. The Division is currently evaluating different methods and will probably use at least one of these through the liability period to judge how well erosion is being controlled. For the present, the commitments made in the plan to control erosion if it becomes or threatens to become disruptive of the postmining land use or if it is inconsistent with erosional activities typical of the local area are adequate.

Anticipated revisions to the Grandall Canyon mining and reclamation plan will need to address the question of which reference areas will be compared to which reclaimed areas. Also, since the preparation plant area contains post-SMCRA disturbance in Schoolhouse Canyon, the plan needs to address which reference area will be used for this disturbance.

**Deficiencies:**

None.

**RECOMMENDATIONS**

It is recommended that this version of Chapter IX be approved. Although the AML reference areas appear to be adequate as standards for revegetation success, it is essential that the areas be evaluated for range condition when being compared to the reclaimed areas for final bond release. They must be in fair or better range condition to be used as standards for success.



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TO: File

THROUGH: Daron Haddock, Permit Supervisor

FROM: Paul Baker, Reclamation Biologist *PBB*

DATE: May 10, 1993

RE: Castle Gate Preparation Plant Operation and Reclamation Plan, AMAX Coal Co., Castle Gate Mine, Folder #2, Carbon County, Utah

## ANALYSIS

By a memorandum dated November 30, 1992, it was recommended that the revegetation portions of the operation and reclamation plan for the Castle Gate Preparation Plant area be approved. It was thought that the entire area was previously mined and would be compared to vegetation reference areas discussed in Chapter IX of the plan. It has since been learned that there are some areas of Schoolhouse Canyon that were disturbed after 1977. Therefore, a different revegetation standard for success needs to be chosen for the areas disturbed after 1977.

There are two reference areas that have already been established and which might be used. These are the Barn Canyon Grass-Sage and the Castle Gate Mixed Brush Reference Areas. Judging from the vegetation maps, it appears that most of Schoolhouse Canyon had a mixed brush, pinyon-juniper, or conifer vegetation type prior to disturbance. Therefore, the mixed brush reference area would probably be most appropriate.

### Deficiencies:

1. AMAX needs to propose a revegetation standard for success for areas of the Castle Gate Preparation Plant area that were disturbed after 1977. The Castle Gate Mixed Brush Reference Area is recommended.

