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DIVISION OF OIL, GAS AND MINING

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TO: File

Through: Daron Haddock, Permit Supervisor

FROM: Paul Baker, Reclamation Biologist

RE: Crandall Canyon Mining and Reclamation Plan, Castle Gate Mine, Amax Coal Company, ACT/007/004-95D, Working File, Carbon County, Utah

SUMMARY

The majority of Division Order 94A concerned revising the Crandall Canyon mining and reclamation plan. The portion dealing with biology is item No. 3. It says:

> **R645-301-300. Biology.** The permittee must provide plans to protect reclaimed areas which show adequate seedbed preparation plans, separate application of seed and fertilizer so that they will not be mixed in the hydroseeder, plans for the use of the supplemental planting mix for ephemeral/intermittent drainages, including locations shown on the reclamation maps and timing of the planting operations, and the final revegetation plans for the cut and fill slopes associated with the Crandall Canyon facilities and access road. Planting, mulching, seeding, and seed mixes proposed should correspond with the information provided in Chapter IX. Reference areas or other standards for measuring success need to be provided in the plan for evaluation of the reclaimed areas to demonstrate reclamation success.

On April 20, 1995, the Division received a response to portions of the Division Order relating to Crandall Canyon, and a revised response was received September 15, 1995. The Division approved the September 15, 1995, submittal but required some changes. A revised plan was received February 21, 1996.

This review evaluates compliance with all applicable aspects of the biology regulations with the exception of those that apply to the entire mine or that do not affect the reclamation plan. The exceptions are fish and wildlife information, operational fish and wildlife protection

plans, subsidence mitigation, and interim revegetation. These plans are presented elsewhere in the mining and reclamation plan.

This version of the plan can be approved..The permittee is encouraged to restore a commitment to put a small depression in the area of pond 14.

ANALYSIS

VEGETATION INFORMATION

Regulatory Reference: R645-301-321

Analysis:

Baseline vegetation information is in Chapter 9, Appendix 9-1, of the existing mining and reclamation plan. Vegetation types in the Crandall Canyon disturbed area were mixed brush, conifer, grass-sage, riparian bottom, and previously disturbed. Three reference areas were established in Crandall Canyon. They are conifer, pinyon-juniper, and riparian bottom. The pinyon-juniper reference area would only be used for judging revegetation success in an area of Barn Canyon formerly proposed for disturbance. Additional reference areas that would be used for judging revegetation success in Crandall Canyon are the Castle Gate mixed brush and the Barn Canyon grass-sage reference areas.

The Crandall riparian reference area had vegetation cover of 47%. Dominant species included narrowleaf cottonwood, bluegrass, an aster, and some weedy plants. Some of the other woody plants were bigtooth maple, Gambel oak, snowberry, juniper, Douglas fir, and ponderosa pine. Thirty-six species were found in this reference area.

Vegetative cover in the Crandall conifer reference area was 74%, mostly from Douglas fir and ponderosa pine. Other frequently-occurring plants included snowberry and perennial grasses. Twenty-three species were encountered in this reference area.

The Crandall pinyon-juniper reference area had 53% total vegetative cover comprised primarily of intermediate wheatgrass, western wheatgrass, pinyon, juniper, and curlleaf mountain mahogany.

The two other reference areas proposed as standards for revegetation success are outside Crandall Canyon. The Castle Gate mixed brush and Barn Canyon grass-sage reference areas had 41 and 53% vegetative cover, respectively. Dominant species are typical for these vegetation communities, including *Agropyron* sp. (probably salina wild rye rather than a wheatgrass), sagebrush, Utah serviceberry, and fourwing saltbush.

Appendix 9-1 also includes raw data sheets which give complete lists of all species encountered in sampling. With this information, it is possible to determine the extent of cover of each species.

The Division normally requires sampling of areas proposed for disturbance before they are disturbed. This information was apparently not gathered, and it would be impossible to obtain it now. Although this is considered a deficiency in the plan, it cannot be corrected.

Revegetation feasibility is discussed under "Revegetation."

Findings:

This section of the mining and reclamation plan is complete and accurate except that it does not contain baseline vegetation information for disturbed areas. However, since this information was apparently not gathered and since the area has already been disturbed, it is impossible to obtain it.

REVEGETATION

Regulatory Reference: R645-301-340

Analysis:

Revegetation Methods

Revegetation plans are contained in both Chapter 9 and the proposed amendment.

Section 3.7-5(4)(6) discusses alternative sediment control measures that include seedbed preparation. Possible measures to be used include surface ripping, contour furrowing, mulching, and surface roughening with mulch incorporation.

Mulch will be applied at the rate of two tons per acre prior to roughening the surface. The area will be roughened by gouging the soil to a depth of 12 to 18 inches using the bucket of a track-mounted backhoe. Chapter 9 says wildlife habitat will be created by development of microtopographic features, such as swales and rises. Following seeding and fertilization, the site will be mulched again at a rate of two tons per acre.

The methods proposed are considered the best available seedbed preparation techniques for revegetation in this area of Utah. Gouging provides microtopographic features that trap water and increase seedling germination and establishment.

Seeding will commence immediately after seedbed preparation to minimize the potential for erosion. Chapter 9 says planting will typically occur after October 15 and before the ground freezes. When necessary, spring planting may occur between March 15 and May 15. Drainages will be planted in April when possible. Unusually favorable weather conditions or compliance requirements may necessitate planting at other times.

The planting times discussed in Chapter 9 are standard for Utah. Spring seeding is not recommended but is sometimes necessary. Where it is necessary, it should be done as early as possible; May is usually too late (except in 1995).

Species list two as shown in Chapter 9 will be used to seed most areas, including cut slopes along the roads. Species list five will be used to seed areas within 20 feet of the edge of reclamation channels CCRD-23A, CCRD-23B, and CCRD-23C. The seed mixes will be mechanically or hand broadcast according to the accessibility of the area. The area will then be mulched and fertilized. Chapter 9 says native hay or straw mulch will be used except in areas that are hydroseeded where a wood fiber hydromulch will be applied at the rate of one ton per acre. The applicant does not propose to hydroseed Crandall Canyon.

North-facing slopes will be seeded with species list three, but willows and cottonwoods will be replaced by ponderosa pine, juniper, and Douglas fir planted at the rate of three hundred per acre. Planting locations will be determined by the Division and the applicant.

Species list three was intended for a riparian area, but, with a few exceptions, it is appropriate for the north-facing slopes in Crandall Canyon. The exceptions are dogwood and the two species the applicant plans to exclude, cottonwoods and willows.

The planting rate for ponderosa pine, Douglas fir, and juniper will not produce a closed stand. Rather, there should be more open areas conducive to wildlife use.

Species lists two, three, and five meet regulatory requirements and include those species expected to be necessary to reestablish vegetative cover in Crandall Canyon. Cottonwoods and willows are listed as optional in species list five. The riparian area in Crandall Canyon has cottonwoods and willows, so they should be planted.

Chapter 9 discusses irrigation and pest and disease control. No irrigation is planned, but transplants will be watered on a case-by-case basis to minimize drought kill. No pest or disease control measures are anticipated to be necessary, but a plan will be developed in coordination with Carbon County Weed and Pest if needed. This plan would also be approved by the Division.

Revegetation Success Standards

Four reference areas will be used to determine revegetation success. Two of these, the Crandall riparian bottom and Crandall conifer, are in Crandall Canyon. The other two, the mixed brush and grass-sage, are outside Crandall Canyon. Section 3.7 does not specify which grass-sage and mixed brush reference areas would be used, but Table 3.3 in Appendix 9-1 indicates the permittee intends to use the Barn Canyon grass-sage and Castle Gate mixed brush reference areas. Appendix 3.7T is a map showing which reference areas would be compared to which revegetated areas. Judging from the data in Appendix 9-1, these reference areas are appropriate for comparing to reclaimed areas. Since the riparian species mix will be used within 20 feet of the edge of the channel, the Crandall riparian bottom reference area will be used for comparison in this same area.

With the exception of erosion control, Chapter 9 includes methods for judging the diversity, seasonality, and other characteristics of reestablished vegetation as required by R645-301-353 and R645-301-356. Absolute cover will be used to compute the Motyka Index. This index will then be used to compare reclaimed and undisturbed areas. Cover, production, and stocking, as applicable, will need to meet the requirements of R645-301-356.100 and R645-301-356.200.

In the proposed Section 3.7, the applicant proposes to judge erosion control success by comparing runoff from reclaimed areas with runoff from an undisturbed adjacent area. Erosion will be controlled such that sediment contributions from the reclaimed area will be equal to or less than the contributions from the undisturbed area. Should the reclaimed area show signs of excessive erosion, steps will be taken to remedy the situation through contour furrowing, ripping, surface roughening, or other techniques. The standard is acceptable, but it will require the operator to obtain upstream and downstream water quality samples. Any rills or gullies that either disrupt the postmining land use or vegetation reestablishment will need to be repaired.

According to Section 3.7 of the current mining and reclamation plan, the postmining land use for the Crandall Canyon area is undeveloped land. This is different from a wildlife or rangeland grazing postmining land use mainly in the degree of management it receives. Because the postmining land use is not wildlife, no specific woody plant density standard for success is being established. However, the permittee will still need to meet diversity requirements which will necessarily include establishment of trees and shrubs.

Field Trials

The middle and upper pads appear to have soil that will be adequate for final reclamation; however, they do not appear to sustain as much vegetation as expected. Several reasons may

account for this, including compacted or rocky soils, wildlife use, or adverse climatic conditions. The permittee intends to use these soils as substitute vegetative growth medium during reclamation. The Division has concerns about whether cover and productivity for the vegetation existing in this area are similar enough to reference area values and if vegetation that is at least equal in extent of cover to the natural vegetation of the area be reestablished using the substitute soils.

The permittee has committed to conduct a vegetation field study in 1996 and qualitatively assess the vegetation in selected areas of the middle and upper pads. Based on this assessment, a vegetation sampling program will be implemented to compare the vegetation in these areas with appropriate reference areas. If the results indicate vegetative cover and production on the pads are truly less than in the reference areas, field trials may be conducted to establish the proper reclamation techniques to be used in those areas where substitute soil from the middle and upper pads is to be used for final reclamation.

Fish and Wildlife Habitat

Chapter 9 says microtopographic features, such as swales and rises, will be created during regrading. Where rocks become available, the permittee will construct rock piles. Snags and roosts will be constructed whenever materials become available. Wetland areas will be created where topography and hydrology lend themselves to their creation.

The permittee had proposed to leave a depression in the area of pond 14 to catch water from a seep that is suspected to be in the area. However, because of perceived regulatory requirements, the permittee decided not to pursue this option.

A warm season water source in Crandall Canyon would be very desirable for wildlife habitat enhancement. Current Division personnel have never seen pond 14 without water, and the vegetation near this pond is indicative of a continual water source. Chapter 9 of the approved plan has provision for creating small depressions where conditions warrant.

OSM directive TSR 14, "Construction of Wetlands as a Postmining Land Use," discusses the criteria for creating small depressions. It says:

> . . . wetlands may be created and retained on reclaimed lands without regard to the permanent impoundment requirements. The depressions must be 'small.' The surface area or depth of water which would qualify as 'small' are not defined in the Federal rules. Depressions may be of any size compatible with the postmining land use and must not pose a safety risk associated with potential failure of an impoundment.
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> Small depressions must be a dugout or basin as opposed to an embankment-type

construction.

The wording in this directive indicates the normal requirements for permanent impoundments do not apply to small depressions as long as they are constructed according to certain criteria. Thus, the Division would be able to allow construction of a small depression meeting the criteria of the directive without requiring a great deal of design and post-construction inspection work.

Since the plan already contains provisions for making small depressions, the plan for Crandall Canyon can be approved. However, the permittee is encouraged to reinstate the specific plan to put a small depression in Crandall Canyon.

In Sections 3.7-5(3)(1) and 3.7-5(3)(5), the application says power poles being used for raptor habitat will not be removed in final reclamation. The applicant will need to determine whether the power poles are being used by raptors, and they may also need to modify them. Use would be evidenced by whitewash on the poles or regurgitated bones or portions of animal carcasses at the base. Any poles not being used are probably not needed for raptor habitat and should be removed. The Division of Wildlife Resources should be able to provide additional information about what modifications may be needed and which poles are in good locations.

Findings:

This portion of the application and Chapter 9 of the current plan are complete and accurate. The permittee is encouraged to reinstate the plans to put a small depression in the area near pond 14 for wildlife habitat. OSM directive TSR14 would allow the permittee to build a depression with minimal design and construction requirements.

RECOMMENDATIONS

Amax has adequately addressed most regulatory requirements in this application for changing the Crandall Canyon mining and reclamation plan. The current application is a tremendous improvement over the application received in April.