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State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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September 24, 1992

Mr. Richard Allison, Jr.
Project Supervisor
AMAX Coal Company, Belle Ayr Mine
2273 Bishop Road
P. O. Box 3005
Gillette, Wyoming 82717-3005

Dear Mr. Allison;

Re: Deficiencies in Revegetation Plan, AMAX Coal Company, Castle Gate Mine, ACT/007/004, Folder #3, Carbon County, Utah

The Division has completed a review of your submittal received on August 24, 1992, intended to satisfy the stipulation under Docket 91-001 with respect to revegetation at the Castle Gate Mine. As anticipated a number of deficiencies have been identified which must be corrected. The enclosed technical memo by Paul Baker outlines the problems that must be addressed.

Please review the memo and respond to the deficiencies as quickly as possible. Our original schedule for resubmittal of the revegetation plan was set for two weeks following the date the review was completed. With this in mind, you should respond by October 8, 1992. Please call me or Paul Baker if you have any questions.

Sincerely,

Daron R. Haddock
Permit Supervisor

Enclosure
cc: P. Baker
AMAXREVE.PLA

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TO: Daron Haddock, Permit Supervisor

FROM: Paul Baker, Reclamation Biologist

DATE: September 22, 1992

RE: Castle Gate Revegetation Plan, Amax Coal Co., Castle Gate Mine, Folder #2, ACT/007/004, Carbon County, Utah

SUMMARY

Amax has revised Chapter 9 of its MRP. This revised chapter proposes that the standards for success for pre-SMCRA areas be changed so that they would only need to meet the requirements of R645-301-356.250.

Many of the changes to this chapter are desirable commitments that should improve the chances for revegetation success while enhancing wildlife habitat. On September 21, 1992, I met with Mickey Steward and Steve Laird of Amax and discussed the deficiencies in this memorandum. Except for the standards for success, I believe that we agreed on every issue, and a revised Chapter 9 should be forthcoming soon.

ANALYSIS

R645-301-322 Vegetation Information

Proposal:

This submittal contains Appendix B which had not been in the MRP and was thought to possibly be lost.

Analysis:

The information in this appendix will be useful in evaluating reclamation plans and standards for success.

Deficiencies:

None.

R645-301-341.100 Revegetation Schedule

Proposal:

The plan gives a general schedule for reclaiming the various areas of the mine. A sequence of major reclamation steps is included. Under R645-301-354 Revegetation: Timing, the plan states that planting will typically occur after October 15 and before the ground freezes. When necessary, spring planting will occur between March 15 and May 15. Drainages will be planted in mid-April when possible. Unusual circumstances may require planting at other times.

Analysis:

This schedule is acceptable. Spring planting is usually recommended for transplants, but fall planting can be equally successful if done properly.

Deficiencies:

None.

R645-301-341.210 Species and Quantities of Plant Materials

Proposal:

The plan includes four seeding and planting mixes. Mix 1 is to be used in pre-SMCRA areas. Mix 2 is to be used in SMCRA areas, chiefly Crandall Canyon, and mixes 3 and 4 are to be used in wildlife areas no matter where they occur.

Analysis:

The plan needs to better specify where the mixes will be used. It needs to show where the wildlife areas and the SMCRA and pre-SMCRA areas are.

The general requirements of R645-301-353 require that the vegetative cover be comprised of species native to the area except where introduced species are necessary and desirable to achieve the postmining land use. These requirements apply even in areas where the standard for success is R645-301-356.250. Species list 1 which is to be used for pre-SMCRA areas contains species that are introduced and are probably not

needed for this mixture. Seed is available of native species that are adapted to the site and which should perform well. Seed of these native species is not outrageously expensive.

Rather than making extensive changes to species list 1, species list 3 could be used in all of the areas except some riparian areas and Crandall Canyon. If seed mix 1 is to be used, intermediate wheatgrass and smooth brome should be deleted. The variety shown for smooth brome in species list 1, "Bromar", is actually a variety of mountain brome (Bromus carinatus). Mountain brome would be an acceptable substitute for smooth brome. A few other species should be added to species list 1 if it is to be used, including salina wild rye (Elymus salina), Indian ricegrass (Oryzopsis hymenoides), and northern sweetvetch (Hedysarum boreale). However, it would be much simpler to use species list 3 instead.

Species list 2, the seed mix proposed for post-SMCRA areas, corresponds to seed mix 3 in the existing plan. Only genera are listed for three of the components of the mix, Penstemon sp., Poa sp., and Amelanchier sp. Penstemon strictus, Poa pratensis, and Amelanchier alnifolia are recommended for this species mix.

Planting mix 2 from the existing plan, a list of tree and shrubs that were to be planted in Crandall Canyon, has been deleted. This mix or something intended to give equivalent results needs to be restored to the plan for north-facing slopes in Crandall Canyon. Otherwise, it is unlikely that a conifer vegetation type with similar species, diversity, etc., compared to the reference area can be achieved within the liability period.

Deficiencies:

1. Species included in the seeding and planting mixes must be native species unless the Operator can demonstrate that introduced species are necessary and desirable to achieve the postmining land use.

2. Planting mix 2 from the existing plan or another seed or planting mix which would make it possible to achieve the general requirements and standards for success of R645-301-353 and R645-301-356 needs to included in the MRP for the north-facing slopes of Crandall Canyon.

R645-301-341.220 Planting and Seeding Methods

Proposal:

Fertilizer, if needed, will be broadcast either prior to seeding, with the hydroseeder,

or following plant establishment depending on the condition of the growth medium and the success of establishment.

Seed will be applied with either a drill, by hydroseeder, or by broadcasting. Where a drill is to be used, a broadcast seeder will be attached to the drill or broadcast methods will be used to ensure separate shallow seeding of small seeds and fluffy or trashy seeds.

Analysis:

The planting methods proposed in the plan incorporate recommendations made in the "Interagency Forage and Conservation Planting Guide for Utah". They should be successful if other factors are favorable.

The statement that fertilizer may be applied with the hydroseeder may simply be meant to indicate that fertilizer will be applied with the hydroseeder machinery, but the statement implies that fertilizer and seed could be mixed together in the slurry. This must not be done because the practice has been shown to decrease seed viability by as much as 50%.

Deficiencies:

1. Seed and fertilizer must not be mixed together in the hydroseeding slurry.

R645-301-341.230 Mulching Techniques

Proposal:

Following seeding, seeded areas will be mulched or other soil stabilizing practices will be used to ensure the establishment of vegetation in accordance with the performance standards.

Native hay or straw will be applied at a rate of no less than two tons per acre and will be crimped along the contour. Where tub mulching is not practical or where hydroseeding is the method of seed application, hydromulching with wood fiber, paper fiber, or a wood/paper fiber mixture at a rate of 2000 per acre will follow seeding. Tackifier will be included with the mulch.

Where synthetic mulches promise superior performance, they may be used and this use reported in the annual report. Synthetic mulches will be approved prior to use by UDOGM. Areas inaccessible to hydromulching will be mulched with straw or other appropriate material and tacked with nylon netting. Fiber matting or geosynthetics may

be used in place of mulch and nylon net in such inaccessible areas.

Analysis:

The use of more than two tons per acre of native straw or hay is not recommended. More than this amount can impede vegetation establishment.

Some of the synthetic mulches have shown some promise for better erosion control and vegetation establishment, but the results that I have seen are not conclusive and need to be substantiated by further testing at other locations.

Deficiencies:

None.

R645-301-341.240 Irrigation and Pest and Disease Control

Proposal:

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. Should such control become necessary, a plan will be developed in consultation with Carbon County Weed and Pest and reported in the annual report.

Analysis:

The MRP is required to contain pest and disease control measures, if any. The pest control plans need to be approved by the Division. Label directions must be followed for any pesticides.

Deficiencies:

1. The plan must contain a commitment to obtain approval from the Division if pest and disease control is to be used.

R645-301-341.250 Success Determination Methods

Proposal:

Success determination methods are discussed under the performance standards.

Revegetation of SMCRA areas will be measured in accordance with R645-301-356.100 through 233. Revegetation for previously mined areas will be in accordance with R645-301-356.250. Minimally, it will not be less than the ground cover existing before redisturbance and will be adequate to control erosion.

Analysis:

R645-301-356.250 states that for areas previously disturbed by mining that were not reclaimed to the performance standards and that are remined or otherwise redisturbed, the vegetative ground cover will be not less than the ground cover existing before redisturbance and will be adequate to control erosion. The areas of the Castle Gate Mine that were disturbed prior to 1977 are not within the criteria for this regulation. They are classified as previously mined areas under the definition in R645-100-200, but they were not remined or redisturbed. Therefore, R645-301-356.210 and R645-301-356.230 will be used as standards for achieving revegetation success for the postmining land uses of grazing and wildlife. No changes in revegetation success standards from the existing plan are needed.

In areas where the success standards of R645-301-356.250 apply, such as where a mine is abandoned then redisturbed after 1977, the vegetative cover still needs to meet the general requirements of R645-301-353. This regulation requires that the vegetative cover be diverse, effective, permanent, comprised of species native to the area except when desirable and necessary to achieve the postmining land use, at least equal in extent of cover to the natural vegetation of the area, and capable of stabilizing the soil from erosion. According to R645-301-356.100, the vegetation also needs to be effective for the postmining land use. Some sort of a reference area standard would be needed to show that vegetative cover was at least equal to that of the natural vegetation of the area. The diversity, postmining land use, and soil erosion control criteria also imply comparison to undisturbed areas with the same land use.

To achieve the postmining land use of wildlife, some cover from shrubs is essential although it might not be necessary to have as many as in the reference area. Parts of the disturbed areas are critical elk winter range, and elk do not generally require as many shrubs as mule deer. The Division is required by R645-301-356.231 to specify minimum stocking and planting arrangements after consultation with and approval by Utah agencies responsible for the administration of forestry and wildlife programs. This consultation is currently ongoing with the Division of Wildlife Resources, and the requirements will be made based on local and regional conditions and the capability of the land to support this land use. When the decisions are finalized, the stocking and planting arrangement requirements will be made. This delay should not affect reclamation planned for this year.

The plan needs to delineate what reference areas will be used for which locations. In Crandall Canyon, for example, the existing plan states on page 32 of Chapter 9 that the Castle Gate Mixed Brush, Crandall Conifer, Crandall Riparian Bottom, and Barn Canyon Grass-Sage reference areas will be used as standards for revegetation success, but it does not show which reclaimed areas will be compared to which reference areas.

It is recommended that the plan include a regular vegetation monitoring program for the parameters that will be measured to determine successful revegetation. This monitoring will be required in the last two years of the liability period but is recommended for at least years two and five as well. Some degree of qualitative monitoring will probably be performed by the Division each year, and Amax should also perform annual qualitative monitoring to identify problems.

Deficiencies:

1. Standards for success contained in the plan must be in compliance with R645-301-356. Use of the reference area method and the existing reference areas for comparing vegetative cover, woody species density, and productivity is recommended.

2. The plan must show which reference areas (if the reference area method is still to be used) are to be compared to which reclaimed areas to show success of final reclamation.

R645-301-341.300 Revegetation Feasibility Demonstration

Proposal:

None.

Analysis:

The 1987 annual report mentions that a test plot was going to be established at Goose Island in the spring of 1988. The plan does not discuss this test plot, and the correspondence files and annual reports do not contain any monitoring information for the plot. Inspection reports from the period discuss it only briefly. The purpose of the plot may have been to show that shrubs could be established. The plan needs to discuss the methods used to establish this plot, its purpose, and the results that were obtained.

No future revegetation feasibility demonstrations are anticipated to be needed. The Schoolhouse Canyon refuse pile could potentially need this sort of demonstration sometime in the future, but this is not being required at this time.

Deficiencies:

1. The plan must discuss the methods used to establish the revegetation test plot at Goose Island, its purpose, and the results obtained.

R645-301-342 Fish and Wildlife

Proposal:

Wildlife enhancement will be created by the development of micro-topographic features, such as swales and rises created during regrading; by the establishment of rock piles; and by the use of the species in the seed and planting mixes. Where natural materials are available for the creation of snags and roosts, such snags and roosts will be constructed. Wetland areas will be created wherever topography and hydrology lend themselves to their creation.

Analysis:

Most of the plans contained in this section will require on-site supervision of personnel who perform grading operations. The commitments are very good. Guidelines for creating artificial habitat structures are contained in Division of Wildlife Resources Publication 90-3, "Wildlife Mitigation Technologies for Man-made Impacts".

Pond retention and creation of wetland habitat is being discussed in the hydrology reviews.

Deficiencies:

None.

RECOMMENDATIONS

Most of the problems with this revised version of Chapter 9 are associated with the standards for success. The portions of the plan that deal directly with reclamation have relatively few problems, and it should be possible to resolve them quickly. Approval of some portions of the plan can, hopefully, be given in time that Amax can perform

reclamation at Sowbelly Canyon and the No. 4 Mine this year. Resolution of the standards for success interpretations should not be allowed to impede the reclamation schedule.