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

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November 8, 2001

Tim Kirschbaum, Environmental Engineer
Consolidation Coal Company
P.O. Box 566
Sesser, IL 62884

Re Conditional Approval of Changes to the Biology Sections, Consolidation Coal Co.,
Emery Deep Mine, C/015/015-AM01B, Outgoing File

Dear Mr. Kirschbaum:

The above-referenced amendment is conditionally approved upon receipt of five complete clean copies of the text and two additional copies of Plate VIII-1. Please submit these by November 20, 2001. Thank you for your cooperation in resolving deficiencies in the mining and reclamation plan.

If you have any questions, please feel free to call Paul Baker at 801-538-5261 or me at 801-538-5325.

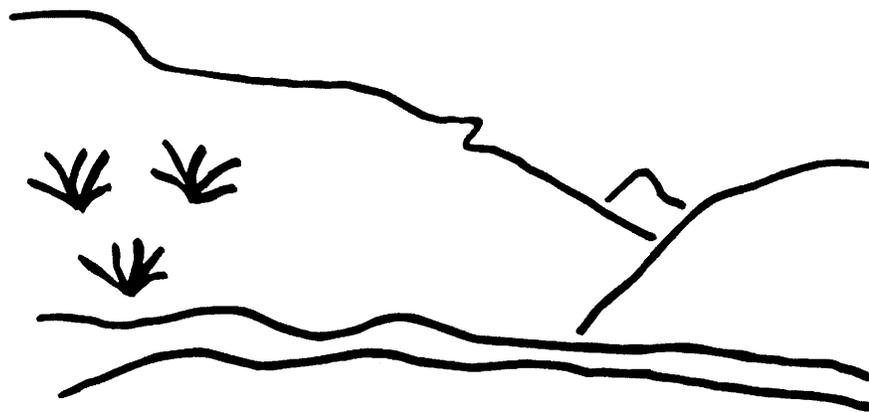
Sincerely,

A handwritten signature in cursive script that reads "Daron R. Haddock".

Daron R. Haddock
Permit Supervisor

sm
cc: Steve Behling Consol
Price Field Office
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State of Utah



Utah Oil Gas and Mining

Coal Regulatory Program

Emery Deep Mine
Biology Section
C/015/015-AM01B-1
Technical Analysis
November 8, 2001

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TECHNICAL ANALYSIS

INTRODUCTION

Other than some aspects of the test plot and interim revegetation plans, the biology portions of the Emery Deep mining and reclamation plan had not been reviewed for several years. On January 29, 2001, the Division sent a review of this section of the Emery plan, and the permittee responded with a submittal the Division received April 10, 2001. The Division's review of this submittal was sent June 12, 2001, and the permittee responded with a submittal the Division received September 10, 2001. This submittal adequately addresses the Division's concerns.

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INTRODUCTION

ENVIRONMENTAL RESOURCE INFORMATION

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

VEGETATION RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.19; R645-301-320.

Minimum Regulatory Requirements:

Provide a map that delineates existing vegetative types and a description of the plant communities within the area affected by surface operations and facilities and within any proposed reference area. The description shall include information adequate to predict the potential for reestablishing vegetation. The map or aerial photograph is required, sufficient adjacent areas shall be included to allow evaluation of vegetation as important habitat for fish and wildlife for those species of fish and wildlife as identified under the fish and wildlife resource information.

Analysis:

The mining and reclamation plan shows nine vegetation communities within the Emery Deep permit area. Plate VIII-1 shows the locations of these communities and a surface operations area including proposed disturbances. While it is impossible to know what vegetation communities existed in pre-law disturbance areas, adjacent communities are greasewood shrubland, riparian shrubland, and mixed desert shrubland. Other communities that have been or would be disturbed include an annual forb community and riparian meadow.

Dominant species, total cover, and production are shown for the predominant communities, and the plan also includes a list of all species encountered in vegetation sampling.

Appropriateness of the vegetation reference areas is discussed under the revegetation section of this analysis.

Findings:

Information provided in the mining and reclamation plan is adequate to meet the requirements of this section of the regulations.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.21; R645-301-322.

Minimum Regulatory Reference:

The application shall include fish and wildlife resource information for the permit area and adjacent area. The scope and level of detail for such information shall be determined by the Division in consultation with State and Federal agencies with

ENVIRONMENTAL RESOURCE INFORMATION

responsibilities for fish and wildlife and shall be sufficient to design the protection and enhancement plan required under the operation and reclamation plan.

Site-specific resource information necessary to address the respective species or habitats shall be required when the permit area or adjacent area is likely to include:

- (1) Listed or proposed endangered or threatened species of plants or animals or their critical habitats listed by the Secretary under the endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), or those species or habitats protected by similar State statutes;
- (2) Habitats of unusually high value for fish and wildlife such as important streams, wetlands, riparian areas, cliffs supporting raptors, areas offering special shelter or protection, migration routes, or reproduction and wintering areas; or
- (2) Other species or habitats identified through agency consultation as requiring special protection under State or Federal law.

Analysis:

Fish and Wildlife Information

Baseline wildlife information is in Appendix IX-1. Most of this information was gathered in a 1980 study which included aerial survey followed by ground truthing. Most of the permit area is critical habitat for ring-necked pheasants. The riparian areas along Christiansen Wash, Quitcupah Creek, and an unnamed stream are also critical wildlife habitats.

A burrowing owl was found near a prairie dog town. While the permittee's consultant only saw one owl and no chicks, the area does appear to have good habitat for this species. Burrowing owls are classified by the State Division of Wildlife Resources as a species of concern because of declining populations.

The only other raptor found in the wildlife survey was an American kestrel. Trees along the streams have some large nests that could be used by raptors, but these nests were not active. There are several species that could make large nests such as these, including both raptors and corvids.

A few deer can sometimes be found in the area, and elk are sometimes forced to come down from higher rangelands because of heavy snow. Pronghorns are not known to occur in the area although there is probably a limited amount of habitat.

The wildlife study included surveys for macroinvertebrates in the streams. Because of poor substrate quality, there is limited potential for macroinvertebrates; however, there are some in certain stretches. Species richness decreases markedly in certain stretches of the stream, and it happens that these are immediately below mine water discharge points. The report explains this is probably due to a change in the substrate quality rather than a result of the effluent; nevertheless, the Division should confirm the conditions discussed in the report.

The permit area contained several white-tailed prairie dog towns, so the consultant searched for any sign of black-footed ferrets and found none.

ENVIRONMENTAL RESOURCE INFORMATION

Threatened and Endangered Species

The information in Section VIII.B.4 has been updated to include a current list of threatened, endangered, and candidate species that might occur in the permit area. None of these species has been found in the permit area although there is some potential that some of these species could occur in the area. The species most likely to be in the area are Wright fishhook cactus (*Sclerocactus wrightiae*), last chance Townsendia (*Townsendia aprica*), and San Rafael cactus (*Pediocactus despainii*).

Additional field work to determine whether these species occur in the permit area is not required at this time; however, if the permittee proposes to disturb new areas, surveys for species potentially in proposed disturbed areas would be needed. In addition, the Division and the Fish and Wildlife Service would need to examine potential effects on the threatened and endangered fish species of the upper Colorado River if the mine begins operating again.

Findings:

Information provided in the mining and reclamation plan is adequate to meet the requirements of this section of the regulations. The Division anticipates no threat to any threatened or endangered species under current operating conditions. The Division should confirm the stream conditions discussed in the consultant's report. If the permittee decides to proceed with any development plans that include new disturbance, the areas to be disturbed will need to be checked for threatened and endangered species. In addition, the Division and the Fish and Wildlife Service would need to examine potential effects on the threatened and endangered fish species of the upper Colorado River if the mine begins operating again.

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OPERATION PLAN

OPERATION PLAN

FISH AND WILDLIFE INFORMATION

Regulatory Reference: 30 CFR 784.21, 817.97; R645-301-322, -301-333, -301-342, -301-358.

Minimum Regulatory Requirements:

Protection and enhancement plan

Each application shall include a description of how, to the extent possible using the best technology currently available, the operator will minimize disturbances and adverse impacts on fish and wildlife and related environmental values, including compliance with the Endangered Species Act, during the surface coal mining and reclamation operations and how enhancement of these resources will be achieved where practicable. This description shall apply, at a minimum, to species and habitats identified. The description shall include: protective measures that will be used during the active mining phase of operation. Such measures may include the establishment of buffer zones, the selective location and special design of haul roads and powerlines, and the monitoring of surface water quality and quantity; and, enhancement measures that will be used during the reclamation and postmining phase of operation to develop aquatic and terrestrial habitat. Such measures may include restoration of streams and other wetlands, retention of ponds and impoundments, establishment of vegetation for wildlife food and cover, and the placement of perches and nest boxes. Where the plan does not include enhancement measures, a statement shall be given explaining why enhancement is not practicable.

Each operator shall, to the extent possible using the best technology currently available: ensure that electric powerlines and other transmission facilities used for, or incidental to, underground mining activities on the permit area are designed and constructed to minimize electrocution hazards to raptors, except where the Division determines that such requirements are unnecessary; locate and operate haul and access roads so as to avoid or minimize impacts on important fish and wildlife species or other species protected by State or Federal law; design fences, overland conveyors, and other potential barriers to permit passage for large mammals except where the Division determines that such requirements are unnecessary; and, fence, cover, or use other appropriate methods to exclude wildlife from ponds which contain hazardous concentrations of toxic-forming materials.

Endangered and threatened species

No underground mining activity shall be conducted which is likely to jeopardize the continued existence of endangered or threatened species listed by the Secretary or which is likely to result in the destruction or adverse modification of designated critical habitats of such species in violation of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The operator shall promptly report to the Division any State- or federally-listed endangered or threatened species within the permit area of which the operator becomes aware. Upon notification, the Division shall consult with appropriate State and Federal fish and wildlife agencies and, after consultation, shall identify whether, and under what conditions, the operator may proceed.

Bald and golden eagles

No underground mining activity shall be conducted in a manner which would result in the unlawful taking of a bald or golden eagle, its nest, or any of its eggs. The operator shall promptly report to the Division any golden or bald eagle nest within the permit area of which the operator becomes aware. Upon notification, the Division shall consult with the U.S. Fish and Wildlife Service and also, where appropriate, the State fish and wildlife agency and, after consultation, shall identify whether, and under what conditions, the operator may proceed.

Nothing in these regulatory requirements shall authorize the taking of an endangered or threatened species or a bald or golden eagle, its nest, or any of its eggs in violation of the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq., or the Bald Eagle Protection Act, as amended, 16 U.S.C. 668 et seq.

Wetlands and habitats of unusually high value for fish and wildlife

The operator conducting underground mining activities shall avoid disturbances to, enhance where practicable, restore, or replace, wetlands and riparian vegetation along rivers and streams and bordering ponds and lakes. Underground mining activities shall avoid disturbances to, enhance where practicable, or restore habitats of unusually high value for fish and wildlife.

Analysis:

The fish and wildlife protection plan is in Chapter IX, Section 817.97. The primary impacts are reduced habitat in the actual disturbed areas and some reduction of habitat quality in adjacent areas. There is also some disruption of movement patterns.

Mitigative measures include educating mine employees about wildlife, and they are advised to not harass wildlife, particularly during high stress periods. All hazards associated with mining activities are appropriately fenced. Water quantity and quality are maintained in all streams. It appears that power lines were designed to be safe for raptors.

The Division is not aware of additional protective measures that need to be implemented at this time. The permittee is required to use the best technology currently available to protect wildlife and enhance wildlife habitat.

Findings:

Information provided in the mining and reclamation plan is adequate to meet the requirements of this section of the regulations.

VEGETATION

Regulatory Reference: R645-301-330, -301-331, -301-332.

Minimum Regulatory Requirements:

Each application will contain a plan for protection of vegetation, fish, and wildlife resources throughout the life of the mine. The plan will provide a description of the measures taken to disturb the smallest practicable area at any one time and through prompt establishment and maintenance of vegetation for interim stabilization of disturbed areas to minimize surface erosion. This may include part or all of the plan for final revegetation as described in reclamation plan for revegetation.

For UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES a description of the anticipated impacts of subsidence on renewable resource lands and how such impact will be mitigated needs to be presented.

A description of how, to the extent possible, using the best technology currently available, the operator will minimize disturbances and adverse impacts. This description will include protective measures that will be used during the active mining phase of operation. Such measures may include the establishment of buffer zones, the selective location and special design of haul roads and powerlines, the monitoring of surface water quality and quantity, and through prompt establishment and maintenance of vegetation for interim stabilization of disturbed areas to minimize surface erosion.

Analysis:

Section VIII.C.3 has two species lists that could be used for contemporaneous reclamation. One of the mixes consists primarily of native species, and the other has two aggressive introduced grasses and one native shrub. Because of the difficulty in establishing vegetation at this site, it may be necessary to use the mix with introduced grasses, but, as far as possible, the mix with mostly native species should be used.

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The application says simply that an approved seeding method will be used, and the Division assumes this means the methods to be used for final reclamation will also be used for interim revegetation. These methods are acceptable.

Findings:

Information provided in the mining and reclamation plan is considered adequate to meet the requirements of this section.

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REVEGETATION

Regulatory Reference: 30 CFR 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

Minimum Regulatory Requirements:

Revegetation: General requirements

The permittee shall establish on regraded areas and on all other disturbed areas except water areas and surface areas of roads that are approved as part of the postmining land use, a vegetative cover that is in accordance with the approved permit and reclamation plan and that is: diverse, effective, and permanent; comprised of species native to the area, or of introduced species where desirable and necessary to achieve the approved postmining land use and approved by the Division; at least equal in extent of cover to the natural vegetation of the area; and, capable of stabilizing the soil surface from erosion.

The reestablished plant species shall: be compatible with the approved postmining land use; have the same seasonal characteristics of growth as the original vegetation; be capable of self-regeneration and plant succession; be compatible with the plant and animal species of the area; and, meet the requirements of applicable State and Federal seed, poisonous and noxious plant, and introduced species laws or regulations.

The Division may grant exception to these requirements when the species are necessary to achieve a quick-growing, temporary, stabilizing cover, and measures to establish permanent vegetation are included in the approved permit and reclamation plan.

When the Division approves a cropland postmining land use, the Division may grant exceptions to the requirements related to the original and native species of the area. Areas identified as prime farmlands must also meet those specific requirements as specified under that section.

Revegetation: Timing

Disturbed areas shall be planted during the first normal period for favorable planting conditions after replacement of the plant-growth medium. The normal period for favorable planting is that planting time generally accepted locally for the type of plant materials selected.

Revegetation: Mulching and other soil stabilizing practices

Suitable mulch and other soil stabilizing practices shall be used on all areas that have been regraded and covered by topsoil or topsoil substitutes. The Division may waive this requirement if seasonal, soil, or slope factors result in a condition where mulch and other soil stabilizing practices are not necessary to control erosion and to promptly establish an effective vegetative cover.

Revegetation: Standards for success

Success of revegetation shall be judged on the effectiveness of the vegetation for the approved postmining land use, the extent of cover compared to the cover occurring in natural vegetation of the area, and the general requirements for Revegetation. Standards for success and statistically valid sampling techniques for measuring success shall be selected by the Division and included in an approved regulatory program.

Standards for success shall include criteria representative of unmined lands in the area being reclaimed to evaluate the appropriate vegetation parameters of ground cover, production, or stocking. Ground cover, production, or stocking shall be considered equal to the approved success standard when it is not less than 90 percent of the success standard. The sampling techniques for measuring success shall use a 90-percent statistical confidence interval (i.e., a one-sided test with a 0.10 alpha error).

Standards for success shall be applied in accordance with the approved postmining land use and, at a minimum, the following conditions:

RECLAMATION PLAN

- 1.) For areas developed for use as grazing land or pasture land, the ground cover and production of living plants on the revegetated area shall be at least equal to that of a reference area or such other success standards approved by the Division.
- 2.) For areas developed for use as cropland, crop production on the revegetated area shall be at least equal to that of a reference area or such other success standards approved by the Division.
- 3.) For areas to be developed for fish and wildlife habitat, recreation, shelter belts, or forest products, success of vegetation shall be determined on the basis of tree and shrub stocking and vegetative ground cover. Such parameters are described as follows: minimum stocking and planting arrangements shall be specified by the Division on the basis of local and regional conditions and after consultation with and approval by the State agencies responsible for the administration of forestry and wildlife programs. Consultation and approval may occur on either a programwide or a permit-specific basis; trees and shrubs that will be used in determining the success of stocking and the adequacy of the plant arrangement shall have utility for the approved postmining land use. Trees and shrubs counted in determining such success shall be healthy and have been in place for not less than two growing seasons. At the time of bond release, at least 80 percent of the trees and shrubs used to determine such success shall have been in place for 60 percent of the applicable minimum period of responsibility; and, vegetative ground cover shall not be less than that required to achieve the approved postmining land use.

For areas to be developed for industrial, commercial, or residential use less than 2 years after regrading is completed, the vegetative ground cover shall not be less than that required to control erosion.

For areas previously disturbed by mining that were not reclaimed to the requirements of the performance standards and that are mined or otherwise redisturbed by surface coal mining operations, as a minimum, the vegetative ground cover shall be not less than the ground cover existing before redisturbance and shall be adequate to control erosion.

The period of extended responsibility for successful revegetation shall begin after the last year of augmented seeding, fertilizing, irrigation, or other work, excluding husbandry practices that are approved by the Division.

In areas of more than 26.0 inches of annual average precipitation, the period of responsibility shall continue for a period of not less than five full years. Vegetation parameters identified for grazing land or pasture land and cropland shall equal or exceed the approved success standard during the growing seasons of any two years of the responsibility period, except the first year. Areas approved for the other uses shall equal or exceed the applicable success standard during the growing season of the last year of the responsibility period.

In areas of 26.0 inches or less average annual precipitation, the period of responsibility shall continue for a period of not less than 10 full years. Vegetation parameters shall equal or exceed the approved success standard for at least the last 2 consecutive years of the responsibility period.

The Division may approve selective husbandry practices, excluding augmented seeding, fertilization, or irrigation, provided it obtains prior approval from the Director as a State Program Amendment that the practices are normal husbandry practices, without extending the period of responsibility for revegetation success and bond liability, if such practices can be expected to continue as part of the postmining land use or if discontinuance of the practices after the liability period expires will not reduce the probability of permanent revegetation success. Approved practices shall be normal husbandry practices within the region for unmined lands having land uses similar to the approved postmining land use of the disturbed area, including such practices as disease, pest, and vermin control; and any pruning, reseeding, and transplanting specifically necessitated by such actions.

Analysis:

Timing

In Section VIII.C.6, the application seeding of disturbed areas will be immediately after site preparation and generally during the late fall planting season. Warm season grasses may be seeded in late spring and summer provided adequate moisture is available. This is consistent with Section III.F.1 and is acceptable.

RECLAMATION PLAN

Revegetation Techniques

The mining and reclamation plan says the soil will be tested and amendments added according to these results. Section III.B.1, page 10, now includes a commitment to sample soils under the roads that will be reclaimed.

After grading is completed, the regraded land will be roughened by either ripping or gouging or a combination of these methods. Next, stockpiled topsoil will be redistributed, and low-ground-pressure equipment will be used to rough grade the surface and leave depressions. Based on soil tests, fertilizer may be broadcast or sprayed onto the soil, and this will be incorporated into the soil by surface roughening prior to seeding.

Following the commitments in the application should lead to a well prepared seed bed that will retain as much water as possible. The test plots had varying degrees of success, but the highest vegetation cover was clearly in depressions where water was able to accumulate. It is vital that the permittee follow these commitments; unless the area is irrigated, the Division considers a roughened seedbed to be critical to revegetation success at this site. As discussed below, the plan does include irrigation as an option.

Section VIII.C.4 has seed mixes that will be used to revegetate the mixed desert shrub and annual forb community, the greasewood community, and the riparian community. Except yellow sweet clover and alfalfa, every species in the seed mixes is native to Utah. The permittee has reduced the amount of yellow sweet clover to be applied. Alfalfa and yellow sweet clover have been used at other mines and have not generally been aggressive to the point of excluding other species. Yellow sweet clover may help decrease the numbers of weeds and may also be a host for nitrogen fixing bacteria.

The permittee has made other changes to the seed mixes according to Division recommendations. Some of these species, such as trident saltbush, alkali sacaton, and Castle Valley clover, have been very successful at the Emery Deep Mine or at other sites with similarly harsh soil and climate conditions. In addition, the permittee has included the scientific names of all but one of the species in the mixes.

Some species in the seed mixes, including species the Division recommended, may not be available at the time of reclamation, particularly if the permittee does not order them well in advance. The Division recommends that the mining and reclamation plan contain a statement indicating what will happen if seed is not available. The permittee could commit to consult with the Division if this happens and document in the annual report what substitutions were made. The permittee has not chosen to follow this recommendation.

Although it is probably possible to revegetate the site using only seed, some species of transplants were moderately successful in the test plots. The permittee should consider planting seedlings of some species, such as fourwing saltbush and mat saltbush.

Seeding will be done through a combination of drilling and broadcast seeding depending on the seed type and soil conditions. Because of seed size and physiology, some seeds need to stay near the surface. Seeds of other species need to be broadcast simply because of mechanical problems with drilling them. The method will be chosen to minimize leveling of the surface because a roughened surface is essential to revegetation efforts.

The Division does not feel drill seeding should be used, but, as long as some species are broadcast seeded and the permittee is aware of the need to keep the surface rough, the plan is considered acceptable.

According to the application, a protective layer of mulch, organic or inorganic, may be used to control erosion. Noxious weed free straw or hay may be applied at a rate of one or two tons per acre and anchored by crimping, with netting, or by spraying with a chemical binder. Other methods included in the application that might be used to control erosion include terracing, riprapping, rock check dams, organic tackifiers, wood fiber mulch, and straw bale dikes.

On slopes steeper than 5h:1v where erosion cannot be controlled by organic mulch, rock will be used to armor the soil surface. Large rock, if available, can be placed to help shade slopes and form microclimates and water harvesting on slopes with harsh aspects.

Because the application says mulch "may" be used to control erosion, the Division was concerned that mulch might not be used on slopes steeper than 5h:1v. The commitment now contained in the plan indicates organic mulch will be used on these slopes and that rock will be used if the organic mulch alone does not control erosion. This commitment satisfies regulatory requirements.

Section III.G.2 discusses revegetation and erosion monitoring and maintenance. All rills and gullies nine inches or more deep will be backfilled or graded, reseeded and mulched or otherwise stabilized. Certain other normal conservation practices, such as weed and insect control, will also be used.

Irrigation and fertilization may be used during the first two growing seasons to enhance vegetation establishment. It is unlikely fertilization will have a significant positive effect on vegetation establishment, but irrigation could. The results of trying irrigation on the test plots are not conclusive, but if done right, irrigation could increase vegetation establishment. Before approving irrigation, the Division would need to know the quality of the water, how much and how frequently reclaimed areas would be irrigated, and how water would be applied.

Rule R645-301-357.300 discusses husbandry practices that may be used during the extended responsibility period. The methods discussed in the mining and reclamation plan are acceptable, but they could restart the extended responsibility period for particular areas. The permittee needs to be aware of these restrictions.

RECLAMATION PLAN

Standards for Success

The mine disturbed area includes areas disturbed both before and after passage of the Surface Mining Control and Reclamation Act (SMCRA). The application contains a new paragraph discussing revegetation success standards for areas disturbed before 1977, and the standards discussed in this paragraph are consistent with regulatory requirements. According to the application, standards for adequate revegetation shall follow the demonstration methods of areas affected post August 3, 1977.

Three reference areas were set up as revegetation success standards for areas disturbed after 1977. The application has been revised to show only three reference areas, and their locations are shown on Plate VIII-1.

The Division normally requires that reference areas be at least one acre, but the greasewood and mixed desert shrub reference areas are about one-fourth acre and the riparian meadow reference area is about 0.06 acres. The application includes a letter from a Natural Resources Conservation Service (NRCS) representative who evaluated the sites and indicated he felt they were adequately sized to be used as reclamation standards. The permittee requested that the Division allow an exception to the one acre recommendation in the guidelines. Based on the recommendation of the NRCS representative and the condition of the sites, the Division is willing to allow an exception to the guidelines.

The reference areas were rated as being in good to high good condition class with some invasive annuals noted in the greasewood area. The Division considers them to be suitable reclamation standards, but they will need to be rechecked when being sampled as comparison standards for final bond release.

The application includes methods for measuring cover and analyzing this information. The methods are consistent with Appendix A of the Vegetation Information Guidelines which is referenced in the rules and thus required. The permittee has acceptably modified a statement indicating when sampling will occur.

After cover information is gathered, weighing factors will be used based on the percentage of reclaimed area being compared to each reference area. While this is not a standard practice, it is satisfactory.

Diversity calculations will be based on a life-form comparison between reference and reclaimed areas. The diversity of reclaimed areas will be considered to have met the success standard if there is a 50 percent or greater similarity of the life forms present between the reference area and the reclaimed plant community. While the application does not specify what methods would be used to make this comparison, it includes the three methods recommended in Appendix B of the Vegetation Information Guidelines. Any scientifically sound comparison

method would be acceptable. While similarity indexes do not truly measure diversity, they do make an appropriate comparison between the reclaimed and reference areas. When the permittee applies for bond release, both the Division and the permittee will need to make a qualitative analysis of the diversity of the reclaimed area and the suitability of the species for the postmining land use.

Fish and Wildlife

The species in the revegetation plan meet the requirements of R645-301-342. Not all of these species are particularly palatable, but there must be a balance between those species adapted to the site and the species best for wildlife.

According to the application, best management practices and technology will be applied at the time of reclamation to enhance wildlife habitat. Surface roughening will provide undulating terrain and vegetation that will be conducive to small animals, birds, and rodents.

When reclamation occurs, there may be limited opportunities to enhance the site for wildlife, particularly along the streams. The application includes revegetation plans for these areas that should enhance the wildlife habitat.

Findings:

Information in the mining and reclamation plan is adequate to meet the requirements of this section of the regulations.

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