

**CHAPTER 3**

**BIOLOGY**

**(R645-301-300)**

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## Chapter 3 (R645-301-300)

### BIOLOGY

#### 3.10 Introduction

This chapter presents a description of the biological resources found within the life of mine permit area.

The sections addressed in this chapter are: the vegetative, fish and wildlife resources; the potential impacts to vegetative, fish and wildlife resulting from the proposed operations, and the mitigation plans and measures to minimize the impacts; and the reclamation plane to restore the vegetative, fish and wildlife resources to a condition suitable to the postmining land use.

#### 3.11

Vegetation, fish and wildlife resources of the permit area and adjacent area are described under 3.20.

#### 3.12

Potential impacts and methods to minimize these impacts are described under 3.30.

#### 3.13

Reclamation procedure to restore and or enhance resources are addressed under 3.40.

#### 3.20 Environmental Description

#### 3.21 Vegetation Resource

##### 3.21.1

There are 10 vegetative communities in Crandall Canyon: (1) Cottonwood; (2) Sagebrush; (3) Mountain Grassland; (4) Mountain Shrub/Grassland; (5) Mixed Mountain Shrub/Conifer/Aspen; (6) Aspen; (7) Spruce/Fir/Aspen; (8) Spruce/Fir; (9) Alpine Grassland; (10) riparian. Of the 10 communities, 6 lie within areas to be disturbed and/or impacted by the development and operation of the proposed Genwal Mine Site (numbers 1, 2, 4, 5, 7, and 10). Mountain Grassland (3) and Aspen (5) are found on the north-facing south slope and higher up on the north slope, outside of areas to be disturbed. Spruce/Fir (9) is also found on the north slope, and Spruce/Fir (8) and Alpine Grassland (9) are found on the highest summits and ridges. In addition to the 10 naturally occurring vegetative communities the previously disturbed areas around the existing mine portals exhibit a vegetation association all their

own.

### Vegetative Communities Falling Within Areas to be Disturbed

Portions of 7 communities will be disturbed by mine site construction and road building. They are: Cottonwood; Sagebrush; Mountain Shrub/Grassland; Mixed Mountain Shrub/Conifer/Aspen; Spruce/Fir/Aspen; Riparian; and previously disturbed.

Representative areas of each community, other than Riparian, were sampled by means of three randomly laced 30 meter transects. Ten 1-square meter plots were randomly selected by lot in each of the 3 transects and sampled for cover and productivity. The Riparian community was sampled in two locations by means of 10 transects, 10 meters or more long placed at right angles to the thread of the stream and spaced from 1 to 10 meters apart (spacing randomly selected by lot). Each of the 20 transects was sampled by 2 dm x 1 meter plots spaced at 1 meter intervals for 5 meters or more (as needed to reach limits of Riparian community) on either side of the centerline of the stream. The Riparian transects were likewise sampled for cover and productivity.

The Seven communities sampled are summarized tabularly in Tables 3-A through 3-H. A complete species list is provided in Table 1 and a community/species list is provided in Table 2. Each of the communities is roughly described by visual dominants below.

### Previously Disturbed Areas

The previously disturbed areas around the existing mine portals were probably Spruce/Fir/Aspen and Mixed Mountain Shrub/Conifer/Aspen before 1939 when mining was just undertaken. Since mining stopped around 1955 three shrubs have taken over; Mountain Snowberry (*Symphoricarpos Oreophilus*), Rubber Rabbitbrush (*Chrysothamnus nauseosus*), and Big Sagebrush (*Artemisia tridentata*).

### Cottonwood

Along the lower 200 meters of Crandall Creek and along the bottomlands of Huntington Creek and one short section of Crandall Creek near the portals, the vegetative community is dominated by Narrowleaf Cottonwood (*Populus augustifolia*) and Rocky Mountain Juniper (*Juniperus Scopulerum*) in the upper story and by Wood's Rose (*Rosa Woodsil*), Big Sage (*Artemisia tridentata*), Squaw Currant (*Ribes cerium*) and Rocky Mountain Juniper (*Juniperus scopulorum*) in the understory.

### Sagebrush

The several small sagebrush flats occurring in the canyon are dominated by Big Sage (*Artemisia tridentata*).

### Mountain Shrub/Grassland

This association, found on the south-facing slopes above Crandall Creek, is dominated by Curl-leaf Mahogany (*Cercocarpus ledifolius*), Rocky Mountain Juniper (*Juniperus scopolorum*), and Bluebunch Wheatgrass (*Agropyron spicatum*).

### Mixed Mountain Shrub/Conifer/Aspen

This association is found primarily near the toe of the south-facing north slope of the canyon. It is essentially a blending of the Mountain Shrub/grassland and Spruce/Fir Aspen communities. It is dominated in the upper story by the conifers Blue Spruce (*Picea pungens*), Douglas Fir (*Psuedotsuga menziesii*) and Ponderosa Pine (*Pinus ponderosa*), and by Aspen (*Populus tremuloides*), Curl-leaf Mahogany (*Cercocarpus ledifolius*), and Rocky Mountain Juniper (*Juniperus scopolorum*). The understory is dominated by Mountain Snowberry (*Symphoricarpos oreophilus*), Rubber Rabbitbrush (*chrysothamnus nauseosus*), Needle and Thread Grass (*Stipa Comata*), and Bluebunch Wheatgrass (*Agropyron spicatum*).

### Spruce/Fir/Aspen

This community is found in the bottomlands and north-facing south slope of Crandall Canyon. The upper story is dominated by Blue Spruce (*Picea pungens*), Douglas Fir (*Psuedotsuga menziesii*) and Aspen (*Populus tremuloides*). The understory is dominated by Mountain Snowberry (*Symphoricarpos oreophilus*). The Spruce/fir/Aspen community generally gives way very quickly to the Mountain Shrub/Grassland or Mixed Mountain Shrub/Conifer/Aspen associations at the toe of the north slope. Right along this juncture common Juniper (*Juniperus communis*) dominates the understory along with Mountain Snowberry (*Symphoricarpos oreophilus*).

### Riparian

The Riparian community was sampled in two locations because of differences in the substrata. Riparian #1 is located about 1.0 km below the existing mine portals. Here Crandall Creek flows over bedrock (Star Point Sandstone). Riparian #2 is located just 200 meters upstream from the existing mine portals. There the substrata is regolithic.

The Riparian communities exhibit more variety than the other communities sampled. This generalization holds for grasses, herbs, and shrubs, but not for trees, which though bordering the riparian zone, seldom encroach.

The dominate shrubs of Riparian #1 are Red Osier Dogwood (*Cornus stolonifera*), a Willow (*Salix Myrtillifolia*), and Common Juniper (*Juniperus communis*). The dominant herbs are

Thistle (*Cirsium pulchellum*), an Aster (*Aster glaucodes*), and Richardson's Geranium (*Geranium richardsonii*). The dominant grasses are Redtop (*Agrostis stolonifera*) and a Fescue (*Festuca Pratensis*).

The dominant shrubs of Riparian #2 are Wood's Rose (*Rosa Woodsil*), a Willow (*Salix myrtilifolia*), and Mountain Snowberry (*Symphoricarpos oreophilus*). The Dominant herbs are the same three as in Riparian #1: Aster (*Aster Glaucodes*), Richardson's Geranium (*Geranium richardsonii*), and Thistle (*Cirsium pulchellum*) plus Heartleaf Bittercress (*Cardamine cordifolia*). The dominant grasses are Smooth Brome (*Bromus inermis*), The dominant grasses are Smooth Brome (*Bromus inermis*), Redtop (*Agostis stolonifera*), and an unidentifiable grass. Also dominant in the grass and herb layer is horsetail (*Equisetum arvense*).

### TREES

Trees in the Cottonwood, Mixed Mountain Shrub/grassland, and Spruce/Fir/Aspen communities were sampled by the Point-centered Quarter Method with tree diameters taken at breast height. Twenty stations were randomly selected in each community. Data is reported as part of Tables 3-B, 3-D, 3-E, and 3-F.

#### 3.21.2 Productivity of lands prior to mining activities.

The only historic commercial utilization of Crandall canyon and the adjacent lease area over the last 50 to 100 years appears to be domestic grazing.

The disturbed area associated with the current mining operator appear to be 6.09 acres.

Approximately two dozen elk cows and calves were in the canyon during the summer of 1980.

This game level of use seems to be consistent annually and only varies depending on available forage which is largely dependent on seasonal climate variations. The balance of productivity estimates are eluded in Appendix 3-1, reference areas and tables of species.

#### 3.22 Fish and Wildlife Information.

Independent consultants were utilized to assess the fish and wildlife resources associated with the Crandall Canyon mine site. Winget Environmental Consultants were employed to investigate the aquatic resources and have completed a report included as Appendix 3-2. The terrestrial wildlife resources were inventoried by Valley Engineering as summarized within a portion of their report included as Appendix 3-3.

The aquatic resources of Crandall Canyon are described in a report prepared by Winget Environmental Consultants and the Division of Wildlife Resources refer to Appendix 3-2. Crandall Creek is being used as a spawning and nursery stream, but it also contains mature resident fish.

The terrestrial wildlife is described in the Vegetation and Terrestrial Wildlife Report, a portion of which has been reproduced and is included as Appendix 3-3.

Crandall Canyon, by the nature of its steep rugged topography, and its being a major drainage of the Wasatch Plateau, supports many species of vertebrate wildlife, including species of high interest to Federal and State Agencies. Both ruffed grouse and blue grouse brood and nest in the area of the proposed mine. Black bear, cougar, elk, mule deer and moose are important big game species which inhabit the Crandall Canyon area. Mule deer and elk winter on the high ledges and ridges of the canyon. It is likely that some animals pass through Crandall Canyon to their winter habitat. The applicant feels that the chance of a wildlife and coal truck collision is minimal, given the width of the road and the range of designated speed of 8 to 18 mph. Moose winter in all of the Huntington Canyon drainage.

### 3.22.2 Site Specific Resource Information Pertaining to each Class (group of wildlife).

#### **Mammals.**

Big game is known to use the Crandall Canyon area as part of their habitat. The migration of elk and deer on the Manti-La Sal National Forest occurs as a sheet migration with no specific corridors. Plate 3-1 shows elk and deer summer range on the high ridges and ledges of the canyon. Plate 3-1 shows critical mule deer winter range habitat in the lower part of Crandall Canyon, just below the proposed permit area and surface facilities. Critical elk winter range occurs no closer than approximately 1.5 miles from the proposed surface facilities.

#### **Birds.**

Information pertaining to migratory and upland game birds within the permit area is included in Appendix 3-3 and the included Table 5. Eleven of the twenty two migratory birds are raptors as described in detail in Appendix 3-3.

There are no known locations of drumming logs in Crandall Canyon or near the proposed disturbance areas, according to Larry Dalton.

#### **Reptiles and Amphibians.**

The published ranges and habitat preferences of the vertebrate species of southeastern Utah have been compared with the location and available habitats of Crandall and Huntington Canyons. Amphibians are always found near water with the habitats found along Huntington and Crandall Creeks and in springs and seeps found on the hillsides above the creeks. Refer to Table 5 included within Appendix 3-3.

**3.22.21 Listed or Proposed Endangered or Threatened Species of Plants and Animals as well as Critical Habitat.**

No endangered or threatened plant species were encountered in the vegetation survey. This conclusion was reached after meeting with Mr. Bob Thompson of USFS, Manti-La Sal National Forest.

**Wildlife-Threatened and Endangered Species.**

Listed threatened and endangered species potentially present in the Permit area are the American Peregrine Falcon (*Falco peregrinus anatum*), which breeds in Utah; Arctic Peregrine Falcon (*Falco peregrinus tundrius*), which migrates through Utah; and Bald Eagle (*Haliaeetus leucocephalus*), which winters in Utah.

None of the species is likely to occur, because habitats in the area are marginal. However, areas of potential occurrence include riparian forests along Huntington Canyon for the Bald Eagle, cliff areas in the region for the American Peregrine Falcon, and upland areas for the Arctic Peregrine Falcon.

**Migratory Birds of High Federal Interest**

This group of especially significant species is comprised of 22 bird species identified by FWS as occurring in the Uintah-Southwestern Utah Coal Production Region. In this area no expansive grassland hunting habitats and the existing levels of human activity - probably preclude this species from utilizing the site and vicinity.

Williamson's Sapsucker (*Sphyrapicus thyroideus*) was determined to breed near the proposed permit area. The Presence of this species is not surprising, because the open Aspen/Conifer mosaic provides preferred nesting habitat (Crockett and Hadow 1975, Crockett and Hansley 1978), and it has been reported as breeding in "all the mountainous counties of the state" (Hayward et al. 1976:120).

The Black Swift (*Cypseloides niger*) also breeds in the Wasatch Plateau (DWR 1978), generally on cliff sites near or behind a waterfall. The near absence of mesic cliff sites in the proposed lease area greatly reduces the likelihood that the Black Swift is present as a breeder. However, it would not be surprising for Black Swifts to use the area for hunting, because they are wide-

ranging in their search for insect prey. White-throated Swifts (*Aeronautes saxatalis*) are common along cliffs in the Permit area, but this species is of no special status in Utah.

- |                     |                          |
|---------------------|--------------------------|
| 1. Bald Eagle       | 12. Sandhill Crane       |
| 2. Golden Eagle     | 13. Great Blue Heron     |
| 3. Ferruginous Hawk | 14. Long-billed Curlew   |
| 4. Cooper's Hawk    | 15. Band-tailed Pigeon   |
| 5. Peregrine Falcon | 16. Pileated Woodpecker  |
| 6. Prairie Falcon   | 17. Williamson Sapsucker |
| 7. Merlin           | 18. Lewis Woodpecker     |
| 8. Osprey           | 19. Black Swift          |
| 9. Spotted Owl      | 20. Western Bluebird     |
| 10. Burrowing Owl   | 21. Scott's Oriole       |
| 11. Flammulated Owl | 22. Grace's Warbler      |

Based on information provided by DWR (1978, 1981a) and (DWR-90-11) five of these species are actually or potentially present in the study area, besides the Bald Eagle, Golden Eagle, Peregrine Falcon, and Bank-Tailed Pigeon previously discussed in this report. The most likely raptors are the Cooper's Hawk (*Accipiter cooperii*) and Flammulated Owl (*Otus flammeolus*), both of which occur in the Wasatch Plateau and prefer wooded country, such as in the major drainage canyons. DWR (1981 a) has reported the permit area as providing substantial habitat for Prairie Falcons (*Falco mexicanus*) as well. However, the distance from potential nest sites on cliff faces is such as not to pose a threat to this species.

Genwal has a firm commitment to report the presence of threatened or endangered species to the regulatory authority. No monitoring program to determine adaption of nesting golden eagle as the golden eagle was reported at the nest site the spring of 1980, both the nest site was inactive upon inspection by the DWR in 1987. No eagles were sited in the vicinity. An aerial survey of the eagle nest will be conducted every three years or on request of the U.S. Fish and Wildlife Service or the Utah division of Wildlife Resources.

The raptor survey is included within the Terrestrial Wildlife and Habitat Report, refer to Appendix 3-3. Crandall Canyon was first investigated for raptor presence and use on June 16 and 17, 1980. Additional surveys were conducted in July of the same year. The golden eagle nest high on the ridge north and east of the existing mine portal area (Plate 3-1), is the only raptor nest in Crandall Canyon according to information supplied by the Division of Wildlife Resources, in Price, Utah. This nest has been inactive since 1982. Some areas of the canyon are being used as a hunting range by raptors. A listing of the raptors are included in Table 5 incorporated within Appendix 3-3. The second nest (187.723) shown on Plate 3-1 was tended during the DWR 1987 monitoring, but with no signs of eggs or young, this nest is located outside of the proposed mine area, but there is a possibility that the raptor

tending this nest may hunt in Crandall Canyon.

### **3.22.22 Habitats of Unusual High Value for Fish and Wildlife.**

Plate 3-1 identifies all wildlife usage area of high value or critical value.

The haul road and surface facilities within the permit area will not disturb any winter range for deer or elk. Plate 3-1 shows elk and deer winter range in the valley bottoms.

Crandall Canyon represents only a portion of winter habitat for moose, the winter range encompasses all the Huntington drainage, with a tremendous amount of unoccupied adjacent habitat, reference Larry Dalton, the impacts will be minimal. The 0.5 acre winter range to be disturbed, of which the riparian habitats are ranked as being of critical value, only approximately 3000 square feet of riparian Habitat will be disturbed. According to Larry Dalton of the State of Utah Division of Wildlife Resources, there is a tremendous volume of adjacent unoccupied habitat suitable to absorb displaced moose. The southeastern Utah moose herd is proliferating at a substantial pace due to the abundance of suitable unoccupied habitat.

As a majority of the road is outside of the permit area with the USFS requesting the haul road remain as a permanent improvement after mining ceases, the USFS as surface owner has jurisdiction over the road.

Genwal recognizes the fact that the Division of Wildlife Resources and the Division of Oil, Gas & Mining consider all seeps and springs to be important to wildlife. If, during the monitoring of the springs, it is proven that mining activities have reduced the flow of any seep or spring in the area by 50% or more, Genwal will notify the Division of Wildlife Resources, the Division of Oil, Gas & Mining and the U.S. Forest service and begin working on an acceptable mitigation plan involving the use of guzzlers. These guzzlers will be designed in cooperation with the Division of Wildlife Resources, the Division of Oil, Gas & Mining and the U.S. Forest Service and placed in the area of the effected spring. No other sources of water, other than the springs located by the seep and spring survey, are known to exist in the mine plan area. Genwal owns shares in the Huntington-Cleveland Irrigation Company that can be transferred if required, to meet the demands of an alternate water supply.

### **3.22.230 Other Species or habitat that Require Special Protection Under State or Federal Regulations.**

At this time there are no known additional areas or species that require special protection. Although Genwal Coal will address any future concerns as they may arise.

### 3.22.300 Fish & Wildlife Service Review.

If following the Fish and Wildlife review of the above section it is determined the information provided is not adequate, Genwal Coal Company will take whatever steps are deemed necessary and reasonable to provide additional requested information in a timely manner. Note letter from USF&W Service Appendix 3-4.

### 3.23 Maps and Aerial Photography.

Genwal Coal Company has a complete set of aerial photographs of the permit area and will make the material available upon request to any regulatory agency. All applicable maps are included in each chapter outlining critical areas that are addressed.

#### 3.23.100 Maps Showing Location of Reference Areas.

Plate 3-2, 3-7, 3-8, and 3-9 shows the location of the vegetation reference areas.

#### 3.23.200

Elevations and locations of monitoring stations used to gather data for fish and wildlife, and any special habitat features; See Appendix 3-2 and 3-3.

#### 3.23.300

Each facility to be used to protect and enhance fish and wildlife and related environmental values; and

#### 3.23.400

If required, each vegetative type and plant community, including sample locations. Sufficient adjacent areas will be included to allow evaluation of vegetation as important habitat for fish and wildlife for those species identified under R645-301-322.

Genwal ensures that all electric power lines and other transmission facilities are constructed to minimize electrocution hazards. All fencing installed at the mine site will be constructed to DWR standards, for the protection of wildlife. The landscape boulders/riprap stockpile at the topsoil storage site will provide shelter for the smaller animals.

Surface disturbance will be kept to a minimum. The road will be designed as narrow as practically possible. Encroachment on Crandall Creek will be kept to a minimum to protect the creek as a source of potential food for trout downstream in Huntington Creek.

During construction of the mine facility Genwal Coal Company, committed to the following: (Taken in it's entirety from 5/22/92

submittal)

The applicant's proposal for minimizing and monitoring impacts to the Crandall Creek drainage during construction activities in addition to the detail of operational plans as outlined under R645-301-731 & R645-301-552.400 and as outlined in this document, justify granting a variance to the 100 foot buffer zone requirements of Section R645-301-731.600. The Division has determined that the proposal to construct surface facilities connected with the proposed underground coal mine, within 100 feet of Crandall Creek, a perennial stream, is in compliance if the following are adhered to:

1. The Applicant states that no further blasting will be done that might deposit rubble in the creek. Temporary sediment control measures will be utilized which include the use of straw dams similar to those used and approved during access road construction, under the USFS road use permit during the summer and fall of 1981. Throughout construction activity, the straw dam provided an acceptable job of retaining sediment.
2. Two more straw dams are proposed for installation in Crandall Creek in the vicinity of stations 71+00 and 79+00. The dams consist of two rows of straw bales laid across the creek with off set ends. The dams will be built high enough so that the water must flow over the center portion of the dam. After construction is completed, the trapped sediment will be removed and then the bales.
3. Embankment erosion control measures will consist of riprapping those sections which will encroach upon Crandall Creek, refer to Plates 5-3, 5-4, 5-16, and 5-17.
4. It is specified in Chapter 12 that pillars are to be designed to ensure that no unplanned subsidence should occur within 200 feet of the center line of Crandall Creek.
5. The area not to be disturbed will be designated a buffer zone and marked as specified in R645-301-521.200.
6. The applicant states that the monitoring of Crandall Creek on a weekly basis during the construction phase will verify the extent of any impact on Crandall Creek water quality. Applicant will sample for water quality weekly for the following parameters: TSS, pH, EC and water temperature. The two sampling sites will be as follows: (1) above the construction site at 300 feet upstream from the quarter corner designated as station 2A on the construction drawings; and (2) below the construction

disturbance at station 72+50. During construction turbidity measurements will also be taken daily at both sampling locations.

7. The applicant commits to the development and implementation of appropriate mitigation plans with the regulatory authority should stream flow diminish significantly or water quality deteriorate.
8. The original stream channel will not be altered.
9. During and after mining, the water quality and quantity from the stream section within 100 feet of the underground coal mining activities shall not be adversely affected.

A copy of the plan to meet the above requirements was submitted to the Utah Bureau of Water Pollution Control in 1982, with a request for a temporary variance to sediment control standards during the applicant's construction phase.

During construction turbidity measurements will be taken daily as indicated. Turbidity will not be allowed to increase more than 10% above background levels. The samples will either be taken to a certified lab or analyzed in the field. Turbidity units will be reported in nephelometric turbidity units (NTU'S). During sustained mining operations, turbidity measurements of Crandall Creek are to be obtained as outlined in Chapter 7.

Applicant has submitted final drawings, refer to Plate 5-3, with this document that show an elevated USFS development road between the coal stockpiles and the creek. Refer to the narrative in Chapter 3 pertaining to the mine site plans. Temporary sediment control measures as described above will be installed as per the design narrative. It will not be necessary to disturb the creek with vehicles or equipment used in construction. Most of the riparian vegetation along the creek can be saved. Installation of a culvert would destroy the riparian vegetation and the food producing ability of the creek.

### 3.30 Operation Plan.

Each application will contain a plan for protection of vegetation, fish, and wildlife resources throughout the life of the mine.

Genwal Coal Company has prepared a plan to mitigate any adverse effects on vegetation, fish or wildlife.

### 3.31

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 R645-301-341.100 and R645-301-341.200.

**Mitigating Measures to be Employed to Reduce Impacts on Vegetative Resources.**

The disturbed area within the permit area, including the three topsoil stockpiles, will be reclaimed upon permanent cessation of mining operations. During the operational phase on the property, water will be applied to the coal and roads within the permit area and adjacent forest development road, when needed, to reduce fugitive dust emissions. Additionally magnesium chloride may be applied to the roads to reduce dust emissions. Prior to the use of this product on the forest access road, the forest service will be contacted and arrangement made for the application under their direction.

All surface areas which are disturbed during our construction phase and which will not be needed for mining operations (i.e., cut banks and outcrops of fill and areas near the sedimentation pond) will be revegetated in the fall of the year following completion of our construction phase. This revegetation will be performed as described;

The seed mix listed below was used as temporary cover to stabilize topsoil stockpiles in the past:

Temporary Mix	Lb./acre PLS
Agropyron smithii (western wheat grass)	4
Agropyron trachycaulum (slender wheat)	4
Bromus marginatus (mountain brome)	3
Elymus cinereus (great basin wild rye)	2
Melilotus officinalis (yellow sweet clover)	2
Total Seed Mix	15

A similar seed type was used in the past for temporary cover, with the exception that Elymus janceus (Russian wild rye) was used in place of great Basin wild rye due to seed availability.

In the future the seed mix which will be used in the final reclamation will also be used for temporary cover to stabilize topsoil stockpiles. Lynn Knuzler of DOGM conferred with the Forest Service regarding the change in seeding procedure and seed mix. An agreement was made, that if Genwal Coal would use the temporary reclamation, the changes in seed mix would be approved by the Forest Service. The temporary seeding may be observed by a representative from the DOGM, Forest Service and Genwal Coal. If

the seed mix should need changes due to over or under growth of a particular plant, a substitution will be made.

The contemporaneous reclamation plan for steep areas (areas having a slope greater than 30%) will be modified to provide a greater and faster growth rate as follows;

1) Medicago sativa (alphlphs - 1.35) was added at a rate of two lbs. PLS/acre to the above seed mix in the past and will be added in the future if necessary.

2) Hydromulch will be applied at a rate of 2000#/acre and fortified with up to 80#/acre tac depending on the slopes involved.

A reclamation map showing post construction contemporaneous reclamation areas and final reclamation accompanies this chapter as Plate 5-17. The correct number of acres to be revegetated in final reclamation is 6.65 acres (additional 1.1 acres is a road).

The disturbed areas within the mine plan area over which the water reports to the sediment pond and which have been contemporaneously reclaimed will achieve an 80% cover on the slopes. The other contemporaneously reclaimed area will be seeded with enough vegetation to prevent erosion. Refer to Appendix 3-5 for details of the irrigation plan to maintain 80% cover.

### 3.32 Subsidence Control Plan

Applicant's survey, as stated in the mine plan, indicates that no structure exists above the areas where there is potential subsidence on the surface. Renewable resource protection is addressed in Chapter 5, Section 5.25.

For the purpose of UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES a description of the anticipated impacts of subsidence on renewable resource lands identified in R645-301-320, and how such impact will be mitigated.

#### Project Impacts of Subsidence.

For a more complete discussion refer to Chapter 5, Section 5.25. Relative to potential impacts to wildlife (tree nesting raptore see Appendix 3-8 letter UDWR.

#### Control Measures to Mitigate Impacts.

Any area that appears to have been impacted through subsidence will be inventoried to determine if any damage to vegetation or wildlife is apparent. In the event damage has occurred the management agency responsible will be notified and a joint plan of mitigation will be formulated and forwarded to UDOGM for their approval prior to implementation

### 3.33 Impacts to Fish and Wildlife

A description of how, to the extent possible, using the best technology currently available, the operator will minimize disturbances and adverse impacts to fish and wildlife and related environmental values during coal mining and reclamation operations, including compliance with the Endangered Species Act of 1973 during coal mining and reclamation operations, including the location and operation of haul and access roads and support facilities so as to avoid or minimize impacts on important fish and wildlife species or other species protected by State or Federal law; and how enhancement of these resources will be achieved, where practicable. This description will: (see Appendix 3-8).

#### 3.33.100

Be consistent with the requirements of R645-301-358;

#### 3.33.200

Apply, at a minimum, to species and habitats identified under R645-301-322; and

#### 3.33.300

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.

#### Project Impact of Mining on Fish and Wildlife.

Operation will unavoidably impact small vertebrate species and increase hunting pressure on big game species. Impact to the fishery in Crandall Creek which is adjacent to the permit area will be kept to a minimum.

The applicant will protect wildlife habitat on the permit area by careful design and construction of mining facilities and transportation corridors, keeping surface disturbance to a minimum. The applicant has committed to report to the regulatory authority the presence of any threatened or endangered species in the area. The substation and transformer located within the permit supplies all the power for the mine site. The power lines from the substation are in underground conduit providing no threat to raptors.

#### Mitigating Measures to be Employed to Protect Fish and Wildlife.

Crandall Canyon is used as a grazing area for elk and deer

during the summer months. Lower Crandall Canyon is critical winter range for deer. Migration of elk and mule deer of the Manti-La Sal range occurs as a sheet migration with no specific corridors as such.

Impacts on the lower 2km. of the canyon will remove approximately 0.5 acre of moose habitat, winter habitat in particular. This represents only a minute portion of the moose winter habitat as the moose habitat encompasses all the Huntington drainage. Of the 0.5 acre winter range to be disturbed, of which the riparian habitats are ranked as being of critical value, only approximately 3000 square feet of wooded area will be disturbed. According to Larry Dalton of the State of Utah Division of Wildlife Resources, there is a tremendous volume of adjacent unoccupied habitat suitable to absorb displaced moose. The southeastern Utah moose herd is proliferating at a substantial pace due to the abundance of suitable unoccupied habitat.

Moose are drawn to Crandall Canyon because of the water and vegetation which grows along the Crandall Creek. The Division of Wildlife Resources provided a map of moose wintering habitat in the area, the information from that map is shown on plate 3-1. Crandall Canyon is of critical grazing value to moose all year long.

As per Larry Dalton, State of Utah, Division of Wildlife Resources, there are no known locations of drumming logs in Crandall Canyon or near the proposed surface or haul road areas to be disturbed.

The only construction work that may have an impact on the Crandall Creek fishery is the construction of the haul and access road. This haul and access road was constructed and is maintained under jurisdiction of the USFS. Impacts and required mitigation are addressed in the approved environmental assessment, authorizing the construction of the Crandall Canyon Road and Bridge as proposed by Genwal Coal Company, dated May 18, 1981. Also, the approved air pollution control plan, as submitted in the permit, contains itemized mitigation for dust abatement during construction. In 1983 the practice of dumping rock and soil adjacent to the mine site near Crandall Creek was stopped, to reduce impact to fish spawning and food production in Crandall Creek. Efforts will continue in the future to limit disturbance of fishery habitat.

Applicant feels that the initial aquatic study and report provides sufficient baseline data. Applicant therefore does not propose any further monitoring of habitat value and biotic community, but only for stream flow and water quality as proposed in previously submitted ground and surface water monitoring plans.

Genwal recognizes the fact that the Division of Wildlife Resources and the Division of Oil, Gas & Mining consider all seeps and springs to be important to wildlife. If, during the monitoring

of the springs, it is proven that mining activities have reduced the flow of any seep or spring in the area by 50% or more, Genwal will notify the Division of Wildlife Resources, the Division of Oil, Gas and Mining and the U.S. Forest Service and begin working on an acceptable mitigation plan involving the use of guzzlers. These guzzlers will be designed in cooperation with the Division of Wildlife Resources, the Division of Oil, Gas and Mining and the U.S. Forest Service and placed in the area of the effected spring. No other sources of water, other than the springs located by the seep and spring survey, are known to exist in the mine plan area. Genwal owns shares in the Huntington-Cleveland Irrigation Company that can be transferred if required, to meet the demands of an alternate water supply.

Resources (UDWR) has conducted cliff nesting raptor surveys of the entire permit area. These surveys have located one site where Golden Eagles either have historically built eries or areas that have a potential for eries. Aerial surveys of the eagle nest will be conducted every three years or on request of the U.S. Fish and Wildlife Service or the Utah Division of Wildlife Resources. Prior to the implementation of UDWR recommendations, Genwal Coal will advise Utah Division of Oil, Gas and Mining (UDOGM) and request their approval and/or recommendations. An annual survey will only be conducted: (1) in the event that UDWR recommends it, (2) this course of action will not unduly harass or stress nesting eagles, and (3) if prudent to insure their safety and/or habitat.

### Wildlife.

In addition to cliff nesting raptors, there is a potential for 5 tree nesting raptors. These are the (1) Gashawk, (2) Sharp Skinned Hawk, (3) Red Tailed Hawk, (4) Swenson Hawk and the (5) Ferrugenous Hawk to inhabit the permit area. All of these species are condo-nestors and will normally have a number of nest locations and only utilize one per any one season. Other than surface disturbances the only potential impact to these species would be the loss of an active nest during the egg incubation period or when flightless young were occupying the nest. This could possibly occur as a result of subsidence with this possible impact, Genwal coal Company representative contacted the UDWR as per their recommendations. Appendix 3-8 outlines the course of action Genwal has agreed to implement

3.40 Reclamation Plan.

3.41 Revegetation.

Each application will contain a reclamation plan for final revegetation of all lands disturbed by coal mining and reclamation operations, except water areas and the surface of roads approved as part of the postmining land use, as required in R645-301-353 through R645-301-357, showing how the applicant will comply with

the biological protection performance standards of the State Program. The plan will include, at a minimum:

The revised acreage is correct in itemizing 6.65 acres of proposed disturbance within the permit area of 2165.42 acres (total lease acreage, including new leases), refer to Plates 1-1, 2-2 and 5-3.

**3.41.100 A Detailed Schedule and Timetable for the Completion of each Major Step in the Revegetation Plan.**

All reclamation, other than areas handled in contemporaneous reclamation, (see section in this chapter) will commence with final grading of disturbed surface areas, which should be completed in approximately one month. Within 30 days following completion of final grading (which should be in late September or early October), topsoil from the stockpile will be redistributed. Nutrients and soil amendments, if shown to be required by soil tests, shall be applied to the redistributed topsoil before the end of October. Seeding, transplanting and mulching will then proceed when moisture conditions are optimal for planting and seeding. Seeding will commence as soon as the seedbed is finished in the late fall. Tree planting will be done in conjunction with seeding or in the following spring, as soon as one can work the soil.

The sediment pond and associated control devices will be removed after the criteria of R645-301-763.100 has been achieved. The sediment ponds will then be reclaimed and revegetated according to the approved reclamation plan and the permanent runoff control system will be completed.

**3.41.200 Description of the following:**

**3.41.210**

Species and amounts per acre of seeds and/or seedlings to be used. If fish and wildlife habitat will be a postmining land use, the criteria of R645-301-342.300 apply.

One seed mix has been developed for all disturbed areas, made up of native and naturalized grass, forb and shrub species (see Appendix 3-6). Trees will be planted in the wooded areas and riparian zone (see Appendix 3-15).

Appendix 3-6 includes a list of grasses, forbs, shrubs and trees to be used after December 1988 for both interim stabilization of topsoil stockpiles and for reclamation. This list was compiled by Lynn Kunzler in conjunction with the USFS. If changes in the seed mixture become necessary due to over or under growth, seed availability, etc., all parties involved will come to an agreement as to the right seed mixture for each area.

Refer to Plate 5-16 and 5-17 for the areas to be planted with planting mixture (Appendix 3-6). Two tenths of a pound per acre of Louisiana Sagebrush (*artemisia ludoviciana*) could be added if needed for erosion control.

The following procedures are designed to revegetate and control erosion. They should, to a large degree, satisfy the commitments made by Genwal Coal Company in their desire to restore the disturbed land to its pre-disturbance condition.

The areas in question are along the adjacent to Crandall Creek in the Huntington Canyon area and will be of a permanent nature.

The actual ground involved comprises approximately 6.65 acres of disturbed land, primarily coal facilities and fill areas. The actual procedures involve a three phase program: (1) hydro and drill seeding, (2) hydromulch the entire area to supplement revegetation and control run-off until stabilization is complete, and (3) to plant seedling to further stabilize the soil and to provide necessary wildlife, hydrological and aesthetic commitments as required under R645 regulations.

### 3.41.220 Methods to be used in Planting and Seeding:

#### Phase 1 Seeding

The entire area of disturbance will be drilled and hydroseeded during the first fall following the completion of the earth work (October through November). Spring seeding was considered too speculative to be implemented based on the variation in spring moisture regimes.

A small portion of the recontoured site will facilitate drill seeding. In order to lessen compaction, a rangeland drill seeder pulled behind a small tractor should be utilized using 1/2 of the # of seed as indicated in Table 4. A tentative estimate of the area to drill seed is approximately .3 acres. Drill seeding is preferred method of application on those areas that are suitable to utilize a drill (less than 30% slope and relatively rock free). the drill assures that the majority of the seed is covered with soil; it also creates small indentations which concentrate available moisture in the proximity of the seed. Unfortunately, the drill has limitations both, in the areas it can be effectively used, and in the final appearance of the reclaimed site. In order to negate the adverse qualities of this methodology, it is recommended that all areas receive an overspray with the hydro-seeding application.

The total area to receive hydro-seeding would be all areas to receive top soil - 6.65 acres. This includes the top soil borrow area and associated disturbance.

Hydroseeding combines the advantages of applying seed uniformly over all areas, plus, with the addition of a tackifying agent, insures a greater degree of stability and seed-ground contact. "Tac" acts much in the same way as a "permeable matt" it sticks the seed to the ground and to a degree, helps adhere the new soil to the side hill. It minimizes the potential for erosion and will be residual for up to 2 years, aiding the seedlings to become established.

**3.41.230 Mulching Techniques, Including Type of Mulch and Rate of Application.**

**Phase 2 Mulching**

The entire area of disturbance will be hydro-mulched during September-October. The seed mix and rate of application is attached (Table 4). Hydromulching will be carried out in conjunction with the earth work. Recommendations for the hydromulching operation are as follows:

This methodology involves the use of hydroseeder to apply the seed and tac to all disturbed areas and then to overspray the seeding with a wood-fiber mulch (approximately 2,000 lbs. per acre -long fiber) in combination with additional tackifying agents.

The following rates of material should be utilized; (Rates of tack were developed with respect to velocity and erosive power of water which is proportional to the square root of the sloop). An empirical factor was determined from laboratory and field studies to arrive at the minimum tac fiber ratio. Thus, 60 pounds of tac per ton of fiber is determined as 60 25% - 15. A 25% slope is about maximum for the minimum amount of tac. For a 100% slope (1:1 or 45 degree) the ratio of tac to fiber is calculated as:

**SUGGESTED RATIOS OF TAC TO FIBER FOR HYDRO-SEEDING AND HYDRO-MULCHING TO SERVE AS MULCH OR SOIL BINDER**

<u>Slope Angle</u>	<u>Slope Ratio</u>	<u>Percent Slope</u>	<u>lbs. Tac Per ton Fiber</u>	<u>Ratio Tac To Fiber</u>
14°	1 : 4	25%	60 (Minimum)*	1 : 30
26°	1 : 2	50%	80	1 : 25
33°	1 : 1 1/2	66%	100	1 : 20
45°	1 : 1	100%	120	1 : 16
45°	1 1/2 : 1	150%	140	1 : 14
64°	2 : 1	200%	160 (Minimum)	1 : 12

\* 60 pounds is suggested as a minimum to insure excellent stabilization with the seed application. An additional 80 pounds of tac per acre with the mulch application has given excellent results on a 1 : 1 slope.

Following the seeding effort the entire area of disturbance will be hydro-mulched. The rate of application of the mulch is 2000#/acre.

No attempts will be made to establish rabbitbrush or sagebrush as previous experience has shown that it is impossible to stop these shrubs from invading the area on their own. If plants of snowberry do not establish from the seeding at the end of the second year, hand plantings of tubular started plants from native plant nurseries will be planted randomly on approximately one rod intervals where they occurred in the original land cover of the disturbed areas.

Trees, species and rates, to be planted on the slopes of 30% or less (in conjunction with the seed mixture) see Appendix A.

The willows will be planted within 20 feet of the drainage to assure sufficient moisture for growth. The standard for the tree seedling will be planted at the rate of 610 seedlings per acre. When considering a normal mortality rate, this would establish the required 90% of the USFS recommended density standard of 550 trees per acre.

The seeding rates used are average for the seeding method used it is hoped that the shrub seeds in the seeding mixtures will take hold and give a random spacing of plants over the area. If the seeded shrubs do not take, then the tubplings will be planted in clumps. While clumping will not give a uniform seed dispersal over the entire area it would enhance wildlife habitat at little cost.

Species diversity standards have been established for revegetated areas. These will insure that a good mix of grasses, forbs, shrubs and trees, where appropriate, will be re-established, and that the reclaimed area will not be dominated by one or two species. The applicant has committed to protecting revegetated areas and to managing the reference area in a manner compatible with postmining land use.

Contemporaneous reclamation will be undertaken following construction. Plates 7-5 and 5-16 have been submitted showing areas of contemporaneous reclamation denoted on Plates 5-16 and 7-5 will be completed during the spring of 1989.

The US Forest Service, US Fish and Wildlife Service and DOGM have requested that the riparian habitat be restored along Crandall Creek. The proposed seed mix and planting mix should accomplish this goal.

**3.41.240 Irrigation, if Appropriate, and Pest and Disease Control Measures, If any;**

No irrigation is anticipated.

Applicant hereby commits to avoid the use of persistent pesticides and chemicals and to prevent fires.

Should lack of precipitation cause the vegetation to fail, all areas will be revegetated. No attempts will be made at irrigating the revegetated areas during final reclamation. The species recommended for revegetation are known to survive in this region without artificial application of additional water.

### 3.41.250

Measures proposed to be used to determine the success of revegetation as required in R645-301-356.

#### Revegetation Monitoring.

Success or revegetation shall be monitored by techniques approved by the Division after consultation with appropriate State and Federal agencies. Comparison of ground cover and productivity will be made on the basis of reference areas. Ground cover and productivity figures from the reference area will be used as a standard for all revegetated areas. The shrub density standard for all areas will be 1336 shrubs/acres (as per baseline data). The standard for trees will be 550 per acre (as per Forest Service recommendations). Stocking rates will be higher to account for mortality.

Applicant has used the reference area method to set criteria for determining success. One reference area was established, as shown on the Vegetation Community Study Map referred to as Plate 3-7. This mix will meet the postmining land use of light livestock grazing and wildlife use. Data on cover and tree density have been submitted. Shrub planting to enhance the habitat for wildlife use will be developed prior to implementation and submitted to DOGM for approval if the seeding is not successful as previously described in Appendix 3-2.

The original plots were done by ocular estimate of circular plots. The circular plots were done randomly by laying a steel circle of 11 feet circumference upon the ground and recording the vegetation density, the bare ground, surface fragments and litter values as a percent of the enclosed circular area. On the MSG area the following original species density in percent of composition are recorded: 92% grass, 2% forbs and 6% shrubs. On the reseeding there will be a minimum of 5% shrubs with a maximum of 20%, minimum of 2% forbs with a maximum of 20% and the remainder will be taken up by the grass species so to meet required standards. On the reference area, the following densities were found on the original survey: grasses 94%, forbs 1% and shrubs 5%. On the SFA area

there will be a minimum of 6% grasses with a maximum of 20%, minimum of 14% forbs with a maximum of 30% and the remainder being taken up by shrubs.

A standard for the riparian area could be set up as 10% minimum and 25% maximum grasses, 16% minimum and 30% maximum forbs and shrubs taking up the balance.

On the MSG area including the reference area, there was no sign that any domestic livestock had ever used this area. The slope steepness of 70% and greater prohibits nearly all domestic livestock use. There was considerable signs that elk and mule deer had and were using the area. The 30% and less slopes and the riparian area show that domestic livestock have used the areas. However, the mine operations on the 30% and less slopes and on the riparian area will exclude all grazing because of the mining operations. Proper use of the area will be no problem.

In addition to the diversity figures already committed to, it will also be insured that no one species makes up more than 60% of the cover in its respective vegetation class; individual species of shrubs and trees will make up no more than 80% density figure for the class.

A detailed plan for monitoring revegetated areas is presented below. This includes specific methods for collecting data on cover, productivity and shrub and tree density, as well as a time table for all monitoring activity.

The reference area will be reviewed by the SCS for range conditions every five years, during the field season before permit renewal. If the range condition is found to be in a deteriorating condition because of encroachment of wildlife or livestock the area will be fenced.

The areas that have been revegetated will be monitored during the 2nd, 4th, 7th, 8th, and 10th years during the last half of the growing season, thus corresponding to the time of the original vegetation survey. Ocular estimates will be made in years 2 and 7 with quantative estimates in years 4, 8, and 10, or 1 year prior to Phase II Bond Release. Species diversity will be confirmed in years 8 and 10, or 1 year prior to Phase II Bond Release, and compared to the reference area data collected during the same sample period. If on any year the monitoring shows the vegetation to be below the requirements, steps will be taken to increase the vegetation by additional seeding with the required seed mixture.

Circular plots will be located randomly across the entire revegetated area. A steel hoop of 11 feet circumference, enclosing an area of 9.6 square feet will be used to determine the ocular plot for estimating percent cover by species and total vegetative cover, percent bare ground, percent of surface fragments and

percent litter within the hoop boundaries.

The point-centered quarter plats will be used to check tree and shrub densities in years 4, 8, and 10, or prior to Phase II Bond Release, in order to demonstrate that 80% of trees and shrubs have been in place for at least 60% of the liability period. No trees or shrubs will be counted that have not been established less than two years (2.0 or 2.1 seedlings).

For sample adequacy of vegetation data during the 8th and 10th years, the formula suggested in the latest DOGM guidelines will be used.

Approximately 22 plots in the MSG area and 10 plots in the reference area will be needed to meet the standard of the DOGM formulas. The double "t" test will be used, the 9th and 10th year, to test similarity of the reference area to its affected vegetational counterpart with respect to cover and shrub density and productivity.

Resulting figures and data from the reclaimed areas will be compared with the data collected the same year from the reference area to determine vegetative compliance. The reclaimed area must meet the success criteria during years nine and ten of the liability period. The double "t" test to check revegetation data and reference area data will be collected the same year.

Adequate sampling will be ensured, especially at the time of bond release, years 9 and 10. Reclamation will be considered successful when percent cover density and productivity are within 90% of the reference area or other approved standard (with a confidence interval of 90%).

As a final step during the last field check upon the vegetational productivity, an adequate sample, as determined by the above adequacy formula, within the reference area will be clipped and weighed and the weights recorded by individual species for each plot. The average weights of these plots will be compared to the average production of species of similar plots taken in the revegetated areas. The production of plots taken from the reseeded area must fall within the limits of 90% or better of the production of plots taken from the reference area. All weights for comparison will be dry weights.

The applicant has given a schedule for monitoring the reference area to standard SCS range inventory techniques for this sampling or to obtaining SCS personnel to do the monitoring. All such monitoring data will be submitted to the Division with the annual report. The applicant also commits to fencing the revegetated area until plants are well established, should grazing pressure on the revegetated area be excessive. Any fencing will be approved by the Division prior to erection.

### 3.41.300

The Division may require greenhouse studies, field trials, or equivalent methods of testing proposed or potential revegetation materials and methods to demonstrate that revegetation is feasible pursuant to R645-300-133.710.

See Appendix 3-2 and 3-3 relative to reference area comparisons.

### 3.42 Fish and Wildlife

Each application will contain a fish and wildlife plan for the reclamation and postmining phase of operation consistent with R645-301-330, the performance standards of R645-301-358 and include the following:

The fish and wildlife control plan is a set of specifications and procedures to avoid potential adverse impacts to wildlife and their habitat.

Following mining, revegetation will be primarily concerned with replacing the pre-mining habitats. High value habitats (pinion-juniper, agricultural and riparian areas) will be restored; in many cases, they will be enhanced beyond their pre-mining condition.

### 3.42.100

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 perches and nest boxes. where the plan does not include enhancement measures, a statement will be given explaining why enhancement is not practicable. No additional enhancements are proposed during the reclamation of the Genwal Canyon Mine Facilities.

### 3.42.200

Where fish and wildlife habitat is to be a postmining land use, the plant species to be used on reclaimed areas will be selected on the basis of the following criteria:

### 3.42.210

Their proven nutritional value for fish or wildlife;

### 3.42.220

Their use as cover for fish or wildlife; and

### 3.42.230

Their ability to support and enhance fish or wildlife habitat after the release of performance bonds. The selected plants will be grouped and distributed in a manner which optimizes edge effect, cover, and other benefits to fish and wildlife.

The goals are to create a diversified cover and/or habitat that will support a wide range of species while restoring to a pre-mining condition and where feasible enhancing habitat.

### 3.42.300

Where cropland is to be the postmining land use, and where appropriate for wildlife-and crop-management practices, the operator will intersperse the fields with trees, hedges, or fence rows throughout the harvested area to break up large blocks of monoculture and to diversify habitat types for birds and other animals.

There are no croplands within the permit area. See Appendix 2-1.

### 3.42.400

Where residential, public service, or industrial uses are to be the postmining land use, the operator will intersperse reclaimed lands with greenbelts utilizing species of grass, shrubs, and trees useful as food and cover for wildlife.

There are no residential, public service or industrial uses within the permit area.

## 3.50 Performance Standards

### 3.51 General Requirements

All coal mining and reclamation operations will be carried out according to plans provided under R645-301-330 through R645-301-340.

### 3.52 Contemporaneous Reclamation

Revegetation on all land that is disturbed by coal mining and reclamation operations, will occur as contemporaneously as practicable with mining operations, except when such mining operations are conducted in accordance with a variance for combined SURFACE and UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES issued under R645-302-280. The Division may establish schedules that define contemporaneous reclamation.

### 3.53 Revegetation

5/4/93

## General Requirements

The permittee will 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.

### 3.53.100

The vegetative cover will be;

### 3.53.110

Diverse, effective, and permanent;

### 3.53.120

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;

### 3.53.130

At least equal in extent of cover to the natural vegetation of the area; and

### 3.53.140

Capable of stabilizing the soil surface from erosion. The erosion condition classification system will be employed on a yearly basis after final reclamation has been accomplished in order to monitor the effectiveness of revegetation in stabilizing the soil surface from erosion.

### 3.53.200

The established plant species will;

### 3.53.220

Have the same seasonal characteristics of growth as the original vegetation;

### 3.53.230

Be capable of self-regeneration and plant succession;

### 3.53.240

Be compatible with the plant and animal species of the area;  
and

5/4/93

### 3.53.250

Meet the requirements of applicable Utah and federal seed, poisonous and noxious plant; and introduced species laws or regulations. The seed mix and plant stock detailed in Section 3.44.220 and Table 4 meet all of the above reference regulations. 3.53 - 3.53.250.

### 3.53.300

The Division may grant exception to the requirements of R645-301-353.220 and R645-301-353.230 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.

Genwal Coal Company has included yellow sweet clover to their mix in accordance with the guidelines of 3.53.300.

### 3.53.400

When the approved postmining land use is cropland, the Division may grant exceptions to the requirements of R645-301-353.110, R645-301-353.130, R645-301-353.200 and R645-301-353.230. The requirements of R645-302-317 apply to areas identified as prime farmland.

There are no prime farm lands within the permit area. See Appendix 2-1 (Prime Farm Land Determination).

### 3.54       Revegetation; Timing

Disturbed areas will 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.

See Section 5.42 this Chapter 5.

### 3.55       Revegetation; Mulching and Other Soil Stabilizing Practices.

Suitable mulch and other soil stabilizing practices will be used on all areas that have been upgraded 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.

See Section 3.41.220 this Chapter 3.

### 3.56 Revegetation; Standards for Success

#### 3.56.100

Success of revegetation will be judged on the effectiveness of the vegetation for the approved postmining land use, the extent of cover compared to the extent of the reference area or other approved success standard, and the general requirements of R645-301-353.

#### 3.56.110

Standards for success statistically valid sampling techniques for measuring success, and approved methods are identified in the Division's "Vegetation Information Guidelines, Appendix A".

#### 3.56.120

Standards for success will 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 will be considered equal to the approved success standard when they are not less than 90 percent of the success standard. The sampling techniques for measuring success will use a 90-percent statistical confidence interval (i.e., one-sided test with a 0.10 alpha error).

#### 3.56.200

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

#### 3.56.210

For areas developed for use as grazing land or pasture land, the ground cover and production of living plants on the revegetated area will be at least equal to that of a reference area or such other success standards approved by the Division.

The area of disturbance will be reclaimed with the intent of limited domestic grazing as a side use to wildlife habitat and will adhere to the standards outlined in 356.230.

#### 3.56.220

For areas developed for use as cropland, crop production on the revegetated area will be at least equal to that of a reference area or such other success standards approved by the Division. The requirements of R645-302-310 through R645-302-317 apply to areas identified as prime farmland.

Soil and land use investigations indicate that an area adjacent to the proposed refuse disposal area could be considered cropland. Most of the cropland in the area requires irrigation and is used for growing feed crops for cattle and sheep. To the best of our knowledge, the cropland will remain as cropland during post-mining use.

No disturbance of cropland or potential cropland is anticipated. In addition there is no prime farmland within the permit area. See Appendix 2.1 prime farm land determination.

### 3.56.230

For areas to be developed for fish and wildlife habitat, recreation, shelter belts, or forest products, success of vegetation will be determined on the basis of tree and shrub stocking and vegetative ground cover. Such parameters are described as follows:

### 3.56.231

Minimum stocking and planting arrangements will be specified by the Division on the basis of local and regional conditions and after consultation with and approval by Utah agencies responsible for the administration of forestry and wildlife programs. Consultation and approval may be on a program-wide basis or on a permit specific basis.

### 3.56.232

Trees and shrubs that will be used in determining the success of stocking and the adequacy of plant arrangement will have utility for the approved postmining land use. At the time of bond release, such trees and shrubs will be healthy, and at least 80 percent will have been in place for at least 60 percent of the applicable minimum period of responsibility. No trees and shrubs in place for less than two growing seasons will be counted in determining stocking adequacy.

### 3.56.233

Vegetative ground cover will not be less than that required to achieve the approved postmining land use.

### 3.56.240

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

**Residential, Public Service or Industrial Postmining Land Use**

Due to limitations imposed by topography, climate, soil conditions, inadequate water supply and other natural features, use of the land within the area has been limited primarily to livestock grazing, wildlife habitat and outdoor recreational activities.

No development for industrial, commercial or residential use is anticipated.

### 3.56.250

For areas previously disturbed by mining that were not reclaimed to the requirements of R645-200 through R645-203 and R645-301 through R645-302 and that are remined or otherwise redisturbed by coal mining and reclamation operations, at a minimum, the vegetative ground cover will be not less than the ground cover existing before redisturbance and will be adequate to control erosion.

All previously disturbed land within the permit area of disturbance will be addressed and reclaimed in the same manner as newly disturbed areas.

As the vegetative ground cover existing before redisturbance was 50.3%, this figure has been established as the vegetative cover standard for success for the areas previously disturbed by mining.

### 3.56.300

Siltation structures will be maintained until removal is authorized by the Division and the disturbed area has been stabilized and revegetated. In no case will the structure be removed sooner than two years after the last augmented seeding.

Genwal Coal will leave all siltation structures in place until adequate vegetation cover is achieved to minimize negative impacts.

### 3.56.400

When a siltation structure is structure was located will be revegetated in accordance with the reclamation plan and R645-301-353 through R645-301-357.

The sediment pond will be reclaimed in the manner described above.

### 3.57      **Revegetation: Extended Responsibility Period**

#### 3.57.100

The period of extended responsibility for successful vegetation will begin after the last year of augmented seeding, fertilization, irrigation, or other work, excluding husbandry

practices that are approved by the Division in accordance with paragraph R645-301-357-300.

**3.57.200**

Vegetation parameters identified in R645-301-356.200 will equal or exceed the approved success standard during the growing seasons for the last two years of the responsibility period. The period of extended responsibility will continue for five or ten years based on precipitation data reported pursuant to R645-301-724.411, as follows:

**3.57.210**

In areas of more than 26.0 inches average annual precipitation, the period of responsibility will continue for a period of not less than five full years.

**3.57.220**

In areas of 26.0 inches or less average annual precipitation, the period of responsibility will continue for a period of not less than ten full years.

Based on historic precipitation record Genwal Coal fully anticipates a 10 year liability and responsibility period.

**3.57.300**

The Division may approve selective husbandry practices, such as weed and brush control, fencing, and water developments or other practices once they have been incorporated into the Utah program, in accordance with 30 CFR 732.17 as being normal husbandry practices, excluding augmented seeding, fertilization, or irrigation, 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 will be normal conservation 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/or transplanting specifically necessitated by such actions.

Genwal Coal will take all steps necessary to insure success of the reclamation.

**3.58 Protection of Fish, Wildlife, and Related Environmental Values**

5/4/93

Crandall Canyon is used as a grazing area for elk and deer during the summer months. Lower Crandall Canyon is critical winter range for deer. Migration of elk and mule deer of the Manti-La Sal Range occurs as a sheet migration with no specific corridors as such.

Impacts on the lower 2 km. of the canyon will remove approximately 0.5 acre of moose habitat, winter habitat in particular. This represents only a minute portion of the moose winter habitat as the moose habitat encompasses all the Huntington drainages. Of the 0.5 acre winter range to be disturbed, of which the riparian habitats are ranked as being of critical value, only approximately 3000 square feet of wooded area will be disturbed. According to Larry Dalton of the State of Utah Division of Wildlife Resources, there is a tremendous volume of adjacent unoccupied habitat suitable to absorb displaced moose. The southeastern Utah moose herd is proliferating at a substantial pace due to the abundance of suitable unoccupied habitat.

Moose are drawn to Crandall Canyon because of the water and vegetation which grows along the Crandall Creek. The Division of Wildlife Resources provided a map of moose wintering habitat in the area, the information from that map is shown on Plate 3-1. Crandall canyon is of critical grazing value to moose all year long.

As per Larry Dalton, State of Utah, Division of Wildlife Resources, there are no known locations of drumming logs in Crandall Canyon or near the proposed surface or haul road areas to be disturbed.

The only construction work that may have had an impact on the Crandall Creek fishery is the construction of the haul and access road. This haul and access road was constructed and is maintained under jurisdiction of the USFS. Impacts and required mitigation are addressed in the approved environmental assessment, authorizing the construction of the Crandall Canyon Road and Bridge as proposed by Genwal Coal Company, dated May 18, 1981. Also, the approved air pollution control plan, as submitted in the permit, contains itemized mitigation for dust abatement during construction. In 1983 the practice of dumping rock and soil adjacent to the mine site near Crandall Creek was stopped, to reduce impact to fish spawning and food production in Crandall Creek. Efforts will continue in the future to limit disturbance of fishery habitat.

Applicant feels that the initial aquatic study and report provides sufficient baseline data. Applicant therefore does not propose any further monitoring of habitat value and biotic community, but only for stream flow and water quality as proposed in previously submitted ground and surface water monitoring plans.

3.58.100

No coal mining and reclamation operation will 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. The operator will 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 will consult with appropriate state and federal fish and wildlife agencies and, after consultation, will identify whether, and under what conditions, the operator may proceed.

Genwal Coal Company and its employees will notify the division of any T & E species observed on the mine property.

3.58.200

No coal mining and reclamation operations will 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 will 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 will consult with the U.S. Fish and Wildlife Service and the Utah Division of Wildlife Resources and, after consultation, will identify whether, and under what conditions, the operator may proceed.

No nests or eries are located within any area that could feasibly be in jeopardy through mining or mine related activities and at no time will Genwal Coal Company proceed in any manner which could theoretically jeopardize raptors.

Resources (UDWR) has conducted raptor surveys of the entire permit area. These surveys have located one site where Golden Eagles either have historically built eries or areas that have a potential for eries. Aerial surveys of the eagle nest will be conducted every three years or on request of the U.S. Fish and Wildlife Service or the Utah Division of Wildlife Resources. Prior to the implementation of UDWR recommendations, Genwal Coal will advise Utah Division of Oil, Gas and Mining (UDOGM) and request their approval and/or recommendations. An annual survey will only be conducted: (1) in the event that UDWR recommends it, (2) this course of action will not unduly harass or stress nesting eagles, and (3) if prudent to insure their safety and/or habitat.

3.58.300

Nothing in the R645 Rules will 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 or the Bald Eagle Protection Act, as amended, 16 U.S.C. 668 et seq.

3.58.400

The operator conducting coal mining and reclamation operations will avoid disturbances to, enhance where practicable, restore, or replace, wetlands and riparian vegetation along rivers and streams and bordering ponds and lakes. Coal mining and reclamation operations will avoid disturbances to, enhance where practicable, or restore, habitats of unusually high value for fish and wildlife. See section 5.25.16.

3.58.500

Each operator will to the extent possible use the best technology currently available;

3.58.510

Ensure that electric power lines and other transmission facilities used for, or incidental to, coal mining and reclamation operations on the permit area are designed and constructed to minimize electrocution hazards to raptors, except where the Division determines that such requirements are unnecessary.

All electric transmission lines that could pose a threat to raptors have been safeguarded to minimize hazard.

3.58.520

Design fences, overland conveyers, and other potential barriers to permit passage for large mammals, except where the Division determines that such requirements are unnecessary,; and

3.58.530

Fence, cover, or use other appropriate methods to exclude wildlife from ponds which contain hazardous concentrations of toxic-forming materials.

No structures at Genwal Coal Company create barriers to wildlife and no hazardous or toxic materials are stored which wildlife could gain access.