



# State of Utah

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

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3.1

June 17, 1998

TO: File

THRU: Daron Haddock, Permit Supervisor 

FROM: Paul Baker, Reclamation Biologist 

RE: Dugout Canyon Mine Phase II, Canyon Fuel Company, LLC, Dugout Canyon Mine, ACT/007/039-SR98-1, File #2, Carbon County, Utah

## SUMMARY:

On March 16, 1998, the Division issued the permit for the Dugout Canyon Mine with several conditions. The revision reviewed in this memorandum is both an attempt to satisfy some of the deficiencies and a proposal to expand the size of the surface facilities area. This review is primarily a revised version of the original technical analysis for Chapters 3 and 4.

The only substantive change to Chapter 1 is in the right of entry section; therefore, this is the only part of Chapter 1 that was reviewed.

## TECHNICAL ANALYSIS:

## ADMINISTRATIVE INFORMATION

### RIGHT OF ENTRY

Regulatory Reference: R645-301-114

### Analysis:

The permittee has filed an application with the Bureau of Land Management to lease the NW ¼ SW ¼ of Section 23, Township 13 South, Range 12 East. The application is under review, but before the Division revises the permit to include this area, the permittee will need to have acquired the right of entry for this area.

### Findings:

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the permittee must supply the following in accordance with:

**R645-301-113**, The permittee needs to supply complete right of entry information for the NW ¼ SW ¼ of Section 23, Township 13 South, Range 12 East.

## **ENVIRONMENTAL RESOURCE INFORMATION**

### **HISTORIC AND ARCHAEOLOGICAL RESOURCE INFORMATION**

Regulatory Reference: R645-301-411

#### **Analysis:**

Appendix 4-1 provides a cultural resource evaluation of the Dugout Canyon Mine. An intensive archaeological surface evaluation of the mine area was conducted in 1980 under the direction of Eureka Energy Company by Archeological-Environmental Research Corporation (AERC). Four of the sites reported as being potentially eligible for listing in the National Register of Historic Places (NRHP) are in the area of the current proposed mine. The four sites include one prehistoric rock art locus (42CB 92) and three historic coal mine loci: the Dugout Creek Mine (42CB 2005/291), the Fish Creek Mine (42CB 204/290), and the Pace Canyon Mine (42CB 206/292/574). The Fish Creek Mine and the Pace Canyon Mine were subsequently determined to not be eligible for nomination to the NRHP.

Files at the State Historic Preservation Office, Bureau of Land Management Office, and records of the NRHP were consulted. Further field evaluations were conducted by AERC on the prehistoric rock art and the Dugout Creek Mine in November 1995. In this study, the Dugout Creek Mine was determined to not be eligible for inclusion on the NRHP due to the lack of context and cultural integrity.

#### **Findings:**

Information provided in the plan meets the minimum requirements of this section.

### **VEGETATION RESOURCE INFORMATION**

Regulatory Reference: R645-301-321

#### **Analysis:**

Numerous vegetation communities are represented within the proposed permit area. The permit area ranges in elevation from 7000 to 8600 feet. The plan describes the plant communities as having been heavily impacted by human activities. Baseline sampling was done on several of the vegetative communities within the permit area. Dr. Steve Richardson and Steven Viert conducted vegetation inventories in 1980, Dr. Patrick Collins surveyed the vegetation in 1996, and Patricia Johnston did further studies in 1997. The area proposed to be disturbed has been changed throughout the various studies. The permit area vegetation map (Plate 3-1) delineates broad vegetative communities within and surrounding the permit area. The plan describes vegetative cover, production and shrub density of the Douglas fir, mixed conifer, pinyon juniper, deciduous streambank, and shrub/grass/juniper communities within the permit and adjacent areas.

The pinyon/Utah juniper community had a total vegetative cover of 66 percent when sampled in 1997. Big sagebrush, pinyon and juniper were the dominant species by cover. Shrub density was 2300 stems per acre.

The riparian (deciduous streambank) community occurs within the proposed area to be disturbed. Generally, this community consists of deciduous trees and shrubs such as narrowleaf cottonwood, Rocky Mountain maple, Douglas fir, red-osier dogwood, woods rose and mountain snowberry. In 1997, total vegetative cover, including canopy, was 85 percent. Shrub density was 1625 stems per acre. Productivity of the understory in this community was measured at 912 pounds per acre in 1980. In 1997 the Natural Resources Conservation Service (NRCS) estimated the productivity was 1500 pounds per acre, and they rated the range condition as fair. In 1991 this community was described in fair to poor range condition by the Bureau of Land Management. A site visit in 1996 suggested the area had not been as heavily grazed as reported in the past but that it was still in a somewhat degraded condition. This community type is the most productive in terms of forage availability in the area.

The area of past disturbance is described as once dominated by pinyon and juniper, and it has a potential forage production of 800 pounds per acre. The proposed disturbed area was sampled in 1996 (excluding the riparian area). This area had been disturbed by past mining and coal exploration activities. The area was seeded after the exploration activities. The dominant shrub species by cover was big-tooth maple while rubber rabbitbrush had the greatest number of individuals present. The area is dominated by species that indicate the site has been disturbed. Yellow sweetclover contributed the most vegetative cover to the total cover of 37% (Appendix 3-1).

A literature review and field studies for the area indicate no threatened or endangered plant species are present or are likely to be present (Section 322.200). Field studies were conducted 1979 through 1984. A 1995 letter from Robert Thompson, Forest Service botanist, in Appendix 3-1 says there are no threatened or endangered plant species. The inventory conducted June 24, 1995, found canyon sweetvetch along Dugout Creek approximately one-half mile below the gate.

### **Findings:**

Information provided in the application is considered adequate to meet the requirements of this section of the regulations. The permittee has adequately responded to conditions 11 and 12.

## **FISH AND WILDLIFE RESOURCE INFORMATION**

Regulatory Reference: R645-301-322

### **Analysis:**

All riparian areas are considered by Wildlife Resources to be of critical value for wildlife. By definition in R645-301-322.220, cliffs that support raptors are also considered habitats of unusually high value. Both critical summer and winter big game habitat is present in the permit area.

A fish and wildlife resources survey was conducted December 1979 through November 1981 for the proposed Sage Point-Dugout Canyon coal mining project (Appendix 3-3). Wildlife count data were collected along eight experimental and four control transects through four different vegetation types: riparian, desert shrub, pinyon/juniper and conifer-bush. Each transect monitored reptiles, non-game birds, big game, and medium-sized and small mammals. Upland and migratory game birds were not documented in this study due to their low frequency of occurrence in the survey area. A limited number of macroinvertebrates was found in 1979, and, since the creek is not a fishery resource, further

studies were not conducted.

Detailed information, such as numbers and species presence, was collected in these studies within the area proposed to be permitted at that time. Although this study has provided valuable site specific information, these data should not be considered as baseline information for the current mine plan. The permit and facilities areas are much smaller than they were in the earlier proposal. The study was designed to monitor the effects of coal mine development on wildlife and not to give a baseline description.

Appendix 3-3 contains two maps showing Carbon County deer and elk habitat. Portions of the permit area contain critical winter and summer deer habitat. Elk habitat is classified as high value winter and yearlong habitat. The Division of Wildlife Resources (DWR) says in an April 1996 letter that much of the area is classified as critical deer winter range and is heavily used by deer and occasionally by elk and antelope. Mule deer in the area are considered part of Herd Unit 11b and the elk as part of Herd Unit 11b. Designated critical range and/or any riparian areas are considered high value habitats for wildlife.

Section 322.200, Site-specific Resource Information, says that no threatened or endangered plant or wildlife species were discovered in recent inventories by DWR, the Forest Service, or other qualified personnel. Three listed species (black-footed ferret, bald eagle, and peregrine falcon) could potentially inhabit the area. The peregrine falcon has been observed in several recent surveys of the Carbon County area. No confirmed sightings of black-footed ferrets have occurred within Carbon County during 1995, 1996, and the first quarter of 1997 (Bill Bates, DWR, Section 322.200).

Raptor nest surveys were conducted by DWR in 1995 and 1997, and the plan includes results of a 1998 survey for birds of special interest.. The nest locations identified in that survey are shown on Plate 3-2 (confidential file). Plate 3-2 shows that the permit area contains the following nests:

- Section 20 1 prairie falcon nest (scrape?), old dilapidated
- Section 22 1 active golden eagle nest
- Section 16 1 golden eagle nest, old dilapidated  
2 buteo or red-tailed hawk nests
- Section 23 2 golden eagle nests, old dilapidated

Numerous active and tended golden eagle nests and prairie falcon scrapes are located outside but immediately adjacent to the permit area. No known raptor nests are within the area to be disturbed by facility construction although a pair of golden eagles is frequently seen soaring at the cliff edge in full view of the proposed facilities. (The other nests associated with the eagle pair using the active nest in Section 22 have not been observed.).

Appendix 3-3 contains a report for a survey of birds of special interest done at the mine site. A loggerhead shrike was tentatively identified in this survey, and golden eagles were flying in the area. No other species of special interest were identified.

A bat survey of the proposed disturbed area was conducted in September 1997. A few bats were found in the area; however, the spotted bat and Townsend's big eared bat (both listed in the survey as Category 2) were not found nor potential habitat. Additional surveys will be conducted in the zone of potential subsidence. Plate 3-3 shows the locations of escarpments within the permit area. The plan

says, "... no data or definition was available to determine the criteria for an area to be classified as of 'unusually high value' for bats." High value habitat is considered as habitat critical to the existence of the animal. Cliff escarpments are considered unusually high value for bats and raptors.

Most of the basic information in the bat survey about the status classifications of Townsend's big-eared and spotted bats is incorrect. The study says spotted bats are classified as a category 2 species for listing as threatened or endangered, but this category has not existed for about two years. Also, the Utah Natural Heritage Program ranking is shown as G4SI, but the actual ranking is G4S2.

Townsend's big-eared bats are also ranked as G4S2, but the study says the ranking is SX. The SX ranking would mean the species is extirpated or extinct, but George Oliver of the Natural Heritage Program said he considers Townsend's big-eared bats to be widespread, fairly common, and present in most habitats. The report also says UDWR considers it a category 2 species, but this ranking is not given by Wildlife Resources.

The plan should contain a statement showing the correct status of these species.

#### **Findings:**

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section of the regulations. Prior to approval, the applicant must provide the following in accordance with:

**R645-301-322**, A report about bats in the area incorrectly lists the status of the Townsend's big eared bat and the spotted bat. The report should be corrected or the application should contain a statement giving correct information.

The permittee has adequately responded to permit condition 13.

#### **LAND USE RESOURCE INFORMATION**

Regulatory Reference: R645-301-411

#### **Analysis:**

Land use resource information is given in Chapter 4 of the plan. Premining land uses for the permit area are wildlife habitat and rangeland for cattle and sheep grazing. The land has not been developed or improved for these uses. Recreational use of the permit area is limited due to lack of access through private property. Carbon County has zoned the permit area for mining and grazing (Section 4.11.120). Logging operations were conducted within the permit area in 1996 as shown on a map in Exhibit B, Appendix 4-3. Cascade Resources, logging contractor, reported harvesting six million board feet from the areas shown in Exhibit B. Most of these areas are within the Dugout Creek drainage.

Current productivity of the land surrounding the proposed disturbed area was estimated by George Cook, National Resources Conservation Service, on August 6, 1996 to be 1400 pounds per acre air dry herbage and in low good condition. On December 3, 1997, Mr. Cook reported the Dugout Canyon Mine to have 800 and 1500 pounds per acre air dry herbage in the pinyon/juniper/sage and riparian areas respectively. Mr. Cook indicated in a telephone conversation on March 5, 1998, that there

was no snow on the ground at the December 3 visit. Previous productivity statements about Dugout Canyon showed the area to be severely overgrazed and degraded in the late 1970's and early 1980's. The proposed disturbed area is still grazed, but it is in a somewhat better condition.

A drive through of the permit area above the disturbed area where logging operations had been conducted revealed a degraded condition in the summer of 1997. Steep slopes along Dugout Creek had been logged, roads cut with material side cast, and limited visible revegetation had occurred at that point. Timber slash was in the stream, a culvert plugged, and several small slides had deposited sediment into Dugout Creek. Flatter riparian areas were overgrazed with streambanks sloughing and grass approximately an inch high. DWR stated that logged areas had little ground cover and there were numerous roads which concentrate water flows. Appendix 7-9, page 2, says the logged Douglas fir area was rated in fair condition. The description of the Douglas fir logged area did not accurately reflect on the ground conditions. Mike Suflita, Division Hydrologist, stated that the culvert sizing was conservative and adequate to account for the increased runoff and sedimentation from logging activities within the watershed.

Coal mining has occurred within Dugout Canyon since 1925. The Red Glow Mine on the east side of Dugout Canyon was hand-developed by D. J. Collins in 1925. The Rock Canyon seam on the west side of Dugout Canyon was first mined in 1952 by E.S.O. Coal Company. The Knight Ideal Coal Company mined the Rock Canyon and Gilson coal seams between 1958 and 1964. They extracted approximately 1,326,000 tons of coal in that period. No coal has been mined since 1964, although the portals have been opened and explored several times since then.

The Fish Creek and Pace Canyon Mines which operated in the early 1900's are also located within the permit area.

**Findings:**

Information in this section meets the minimum regulatory requirements.

## **OPERATION PLAN**

### **INTERIM REVEGETATION**

Regulatory Reference: R645-301-332

**Analysis:**

The plan includes an interim seed mixture in Section 341.200. No specific soil preparation, planting, or mulching methods are shown for interim revegetation areas, so it is assumed the same methods will be used as for final reclamation. The plan for final reclamation is discussed below.

The application says cheatgrass control has been initiated at the Soldier Canyon Mine lower topsoil stockpiles. While control has not been completely successful, it has reduced the amount of cheatgrass. The permittee will need to continue control efforts.

**Findings:**

Information provided in the proposal is considered adequate to meet the requirements of this section of the regulations. The permittee has satisfied the requirements of permit condition 5 but will need to continue cheatgrass control efforts.

**FISH AND WILDLIFE PROTECTION**

Regulatory Reference: R645-301-301-333, -301-342, -301-358.

**Analysis:**

**Protection and Enhancement Plan**

The Permittee commits to a wildlife awareness and protection training in its annual training curriculum for all employees and haulage contractors.

A culvert will contain Dugout Creek throughout the length of the disturbed area, and this will significantly affect wildlife within the area. Section 322.200 details a plan to mitigate for the loss of riparian habitat due to the culvert. The mitigation includes seeding some very steep road fills near the stream, planting willows in some sections of the stream, and possibly installing in-stream structures to promote channel stability. The seed mix that it is believed would be used includes two introduced species that would not normally be allowed, but they are rhizomatous species that are needed to stabilize the very steep slopes. There are a few willows along Dugout Creek in the mitigation area but not nearly as many as one would expect. This may be because they have been grazed or otherwise eliminated through people's actions rather than because of the ecology. Coyote willows are present in Soldier Canyon to the west.

The plan says all power lines within the disturbed area will be raptor safe. The permittee has committed to construct in accordance with the publication "Power Line Contacts by Eagles and Other Large Birds."

The permittee commits to minimize impacts to water resources by controlling and monitoring the surface water discharge and water quality.

During construction activities, all mining and supplier personnel and their corresponding equipment will be required to stay within the disturbed area boundary. Loading, unloading, and staging of materials and equipment designated for the construction of the Dugout Canyon Mine facilities will be done within the disturbed area. DWR suggests limiting the construction period between December 1 and April 15 (dates are approximate depending on actual snow conditions).

No endangered or threatened plant or animal species are known within the area. As required by R645-301-358.100, the permittee must promptly report to the Division any state or federally listed endangered or threatened species within the permit area of which they become aware. Seasonal or migrating bald eagles are expected and a wintering bald eagle would not need to be reported.

Dugout Creek is within the Upper Colorado River drainage which has been designated as critical habitat for four threatened or endangered fish. Water use in this area is considered to have a

potential effect on these fish. According to information in the Probable Hydrologic Consequences document, it is estimated the mine will use about 46.5 acre-feet per year. Mitigation to the Fish and Wildlife Service is required if water use exceeds 100 acre-feet each year, so Section 7 consultation should not be required.

Raptor nests within the permit area are identified in the environmental resource section of this analysis. Every nest but one is in the area that would be subsided, and five of the seven are in the subsidence zone for the current permit term. Section 332 describes potential effects as displacement, injury or death of birds and nest destruction. The plan says that upon notification or suspicion of raptor nests in the permit boundary, the permittee will verify the existence of any nests, determine their conditions, and locate their locations in relation to recoverable resources. Information collected in this inventory will be discussed with various agency personnel, and the permittee and the agencies will determine methods of avoidance, explore alternative methods of protection or removal, and develop mitigation plans when needed.

Since the permittee is aware of five nests in the area that would be subsided in the next five years, it is possible to begin developing methods of avoidance, protection, or removal, and determining mitigation plans. These plans should be included in the mining and reclamation plan.

A 1995 letter from Robert Thompson, a Forest Service botanist, says a site inventory was conducted, and no wetlands were found within the proposed disturbed area. It is possible an extremely narrow band of wetland exists along the stream corridor, but the overriding concern for disturbance is the stream and its associated riparian area rather than any possible wetland.

**Findings:**

Information provided in the proposal is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the permittee must provide the following in accordance with:

**R645-301-333,** Because the permittee is aware of raptor nests in the subsidence area for the first permit term, it is possible to begin developing methods of avoidance, protection or removal, and determining mitigation plans. These plans should be included in the mining and reclamation plan.

The first of these deficiencies is not related to the currently-approved plan, so it is not a permit condition. The second deficiency is an extension of condition 10 on the permit. This stipulation requires the permittee to identify specific impacts to raptor nests and discuss avoidance of the nests when mining. This condition is to be addressed prior to mining, but it does not need to be satisfied before initial development mining.

In this section, the permittee has satisfied the requirements of conditions 3 and 4.

## RECLAMATION PLAN

### POSTMINING LAND USES

Regulatory Reference: R645-301-412

#### Analysis:

The postmining land use will be livestock grazing and wildlife habitat. The plan says final reclamation activities, such as grading and seeding, will be completed in a manner to provide lands able to support the postmining land use. Many of the slopes are considered too steep for livestock grazing. In developing a grazing management plan for the Randolph unit, the Bureau of Land Management produced suitability tables based on slope percent and slope length. They found any slopes steeper than 50% (2h:1v) were unsuitable for grazing. Plates 5-3 and 5-4 show numerous cross sections where slopes are steeper than 50%. The applicant justifies the slope lengths and steepness by saying they are similar to the surrounding area. The Division recognizes the premining area has steep slopes; however, given the land use and the unstable condition of the area until vegetation establishment, steep slopes should be confined to upland areas and should not be in the riparian zone (riparian zone as defined in Plate 3-1A and subsequent Division field measurements).

Much of the disturbed area was previously mined and not reclaimed to the current standards. Using current definitions, previous mining activities can be classified as having disturbed or just affected the land. Exploration activities occurred on the site in the 1980's and then again in the 1990's. No topsoil was saved in initial development. However, adequate substitute material should be available to make up the difference as growth medium.

A road exists (prior to current mining) through the permit and disturbed areas. This road will remain for the postmining land use. The plan says the road has a width of 16 to 25 feet within the disturbed area. The reclaimed road will also have a width of about 16 feet.

The Bureau of Land Management and State of Utah own the land in the disturbed area. Appendix 4-3 contains a letter from the State concurring with the postmining land use, but the plan need to contain comments from the Bureau of Land Management concerning the postmining land use.

#### Findings:

Information provided in the proposal is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the permittee must provide the following in accordance with:

**R645-301-412.200**, The permittee needs to provide comments from the Bureau of Land Management concerning the postmining land use.

## **REVEGETATION**

Regulatory Reference: R645-301-341, R645-301-342

### **Analysis:**

#### **Revegetation**

A reclamation timetable is in Figure 5-4. Seeding and planting would be done in late August through late October with some seeding and planting done the following spring or fall if the planting window was to close before planting was completed. Traditionally, seeding is done in the fall with planting done in the spring. However, recent experience at another mine has shown that transplanting in the fall can be very successful.

Areas being reclaimed will be graded to final contours then ripped to a maximum depth of two feet on approximately four-foot centers. The plan needs to specify the minimum ripping depth for the Division to be able to determine it to be adequate.

Next, topsoil will be spread and left in a roughened state, and fertilizer will be applied. Slopes less steep than 2v:1h will then be disced to incorporate the fertilizer. Discing would almost completely eliminate the surface roughness and is not desirable, even to incorporate the fertilizer.

Slopes steeper than 2h:1v will not be ripped where ripping is prohibited by the size of the area of by the slope angle. These slopes will be treated either by dozer tracking parallel to the contour or by gouging with a trackhoe. Section 553.100 says all slopes steeper than 3h:1v will be gouged with a trackhoe. This contradicts the plan to use dozer tracking, and dozer tracking is not acceptable. It leads to smooth slopes where rill and gully erosional features are likely to develop. The plan to use dozer tracking needs to be eliminated.

The plan contains two seed mixtures, one for riparian areas and the other for all other areas. With this revision, the seed mixes have been changed in accordance with requirements in the permit. Every species in these mixtures is native to Utah, and they should provide vegetation that meets the performance standards, including the requirement that they have value for wildlife.

The plan says seed mix 1 will be used on the area above the mine site which has been logged and designated to be planted as a mitigation project; however, Section 322.200, page 3-21, contains a seed mix to be used in this same area. The permittee needs to clarify which seed mix would be used in the mitigation area.

Grass and forb seeds will be drilled where possible; otherwise, the seed will be broadcast. All slopes steeper than 3h:1v will be broadcast seeded. Although both drilling and broadcast seeding are acceptable, the Division has seen very good results with carefully controlled broadcast seeding and recommends this method. Drilling tends to reduce surface roughness.

Methods for establishing vegetation in the riparian areas are discussed in the "Riparian Restoration and Planting" section below.

Following seeding, disturbed areas will be mulched with a Division-approved mulching material. For bonding calculations, wood mulch applied at the rate of 2000 pounds per acre was assumed. On slopes steeper than 3h:1v, high quality erosion control matting will be used to anchor the

mulch.

It is assumed "wood mulch" is wood fiber mulch rather than another material, such as sawdust or bark. Wood fiber mulch is generally more expensive to apply than some other mulches, so using this for bonding calculations is acceptable. However, before actually applying mulch, the permittee will need to have the specific mulch approved by the Division. It is expected mulch will be applied for interim revegetation seedings as early as the fall of 1998.

Under "Irrigation, Pest and Disease Control," the plan says no irrigation is planned and pesticides will not be used unless previously approved by the Division. In the discussion on riparian area planting, it says an irrigation program will be considered if the cottonwoods are planted as transplants. The topsoil storage area at the Soldier Canyon Mine will be treated to attempt to control cheatgrass.

### **Riparian Restoration and Planting**

The applicant plans to restore Dugout Creek using a concept of macro- and micro-channels. The macro-channel will be a riprapped ( $D_{50}=12"$ ) channel 8 to 12 feet wide. The micro-channel within the macro-channel is approximately 3 feet wide and 1 foot deep. The micro-channel will be developed by establishment of 3 types of in-stream structures spaced about every 60 feet. The structures are thought to trap sediment which in turn will allow vegetation establishment. These structures are low stage check dams, bank-placed boulders, and rock or log spurs. Figure 7-12 shows typical drawings of these structures, and Plate 7-9 illustrates where they will be placed.

Stream banks will be seeded with the Final Reclamation Seed Mix #2 (Section 341.200). Trees and shrubs will be planted as specified in the mixture. According to specifications in the plan, the following plantings should occur:

- Narrowleaf cottonwoods and Rocky Mountain maples will be planted on the top of the bank at the rate of approximately 500 per acre. This will provide an 8 foot distance between individuals that will be 2 deep (wide).
- Willows will be planted at the rate of 1000 per acre. Assuming the area in which they would be planted is about five feet wide on each side of the stream, this would equate to a spacing of about one cutting every nine feet. This is not adequate. Maximum spacing in suitable areas is two feet between plants. The permittee needs to commit to this type of spacing which is about 4000 per acre. Realizing that the entire area next to the stream may not have areas suited for planting, the permittee may qualify the commitment.
- Sedge and horsetail plugs will be planted at the rate of 1000 per acre. Species of sedges to be used will need to be determined based on availability and what species are present in the area.
- The mid- to upper bank zone will be planted at a rate of 2250 plants per acre which is the equivalent of 4.4-foot spacings. Species to be used include woods rose, currant, snowberry, elderberry, and serviceberry. The width of this zone varies widely through the length of disturbance.

These planting densities are recommended by the NRCS. Figure 3-1 illustrates the various

planting zones within the riparian area, top of channel, reclaimed slope, and top of riprap. Because of the use of in-stream structures, most plantings will need to be done in clumps in the most favorable locations along the reclaimed channel rather than at specific intervals along the full length. Nevertheless, it will be necessary to have some plantings even away from the structures.

The plan does not say specifically what type of plant material will be used to establish cottonwoods, but either seedlings or pole plantings could be used. Seedlings should be large enough that they would have an influence on the riparian area after ten years. If poles are used, the permittee commits to have them be long enough to reach the water table and at least 1-3 inches in diameter. While the level of the water table is not known, the permittee commits to drill periodic holes to find this level so the poles can be planted deeply enough. Enough of the poles should be left above ground so they will be above the surrounding vegetation. Two to twelve year old wood (non-furrowed, smooth bark) is best. The most important factor is to place the pole eight to ten inches below the summer (lowest) water table.

### **Success Standards**

Revegetation success standards are discussed primarily in Section 356. The cover standards are based on range site baseline sampling done in 1997. They are 66% and 85% cover for the pinyon/juniper and riparian areas, respectively. Raw data and statistical information are in Appendix 3-1.

The woody plant density standard is 2200 stems per acre for both communities. This is a technical standard based on baseline information and professional experience.

The permittee has included range site descriptions for Upland Very Steep Shallow Loam (pinyon/Utah juniper), Semiwet Streambank (narrowleaf cottonwood), and Wet Saline Streambank (coyote willow) range sites. The descriptions of soils, slopes, vegetation, and precipitation for the Upland Very Steep Shallow Loam site appear to match the pinyon/juniper areas of Dugout Canyon fairly well.

The Wet Saline Streambank range site definitely does not apply to the Dugout Canyon riparian area. In this range site description, slopes are mostly 0-2% with elevations from 4600 to 4900 feet. The Dugout Creek stream gradient is about 5%, and the elevation is about 7000 feet. Other aspects of the description do not match.

The Semiwet Streambank range site more closely describes the Dugout Creek riparian area, but it is not a precise match, either. The slope in the range site description is 0-4%, the elevation is 4700 to 6400 feet, and the precipitation is 5-12 inches. Also, the range site description mentions a braided stream channel which does not occur in the stretch of Dugout Creek in the disturbed area. Some of the dominant species in the range site description, such as alkali sacaton, basin big sage, squawbush, and Baltic rush, are either not present or are present in relatively low numbers rather than being dominant.

The permittee needs to find a range site description that more closely matches the riparian area in Dugout Canyon. This can be used to compare to the data for the premining conditions and for a range site that could be used for revegetation comparison, such as in Fish Creek Canyon.

The plan indicates the productivity estimates given by the NRCS would be used as success standards. These values are 800 and 1500 pounds per acre for the pinyon/juniper and riparian areas. The

permittee commits to sample productivity at corresponding range sites if the NRCS production estimates are insufficient to satisfy regulatory requirements.

According to the plan, range sites for reclamation comparison will be chosen and designated the first year of reclamation activity. The designated range sites would be used as reference areas until final revegetation bond release has been issued.

The Division's Vegetation Information Guidelines only approve the NRCS productivity estimation as a success standard when using the reference area method after the reference area is approved based on statistical cover similarity to the proposed disturbed area. The permittee needs to select range sites for comparison of productivity to reclaimed areas now rather than waiting until the time of reclamation. The range sites to be used for productivity comparisons need to have at least as much vegetation cover as the areas to be disturbed.

The "M&RP Attachment A Response," received June 3, 1998, separately from the Phase II revision, contains a map designated Plate 3-1D showing the Fish Creek Range Site area. This range site was chosen in a joint visit by the Division, the permittee, and the permittee's consultant, but it needs to be sampled for cover and compared to the riparian area to be disturbed in Dugout Canyon before it can be approved. Also, the permittee would need to officially propose an amendment to the mining and reclamation plan.

The diversity standard will be a technical standard. The success standard for both the pinyon/juniper and riparian areas is that there will be two tree and shrub species, three grasses, and two forbs each with at least five percent cover. It is unknown how the success standard was selected, but with the other success standards, it should ensure a community that meets regulatory requirements for diversity. However, achieving this standard may be difficult.

The permittee has chosen to not apply the revegetation success standard in R645-301-356.250. Parts of the area to be disturbed have been previously disturbed, others have only been affected, and some are undisturbed. It would be difficult to apply the different standards over the relatively small disturbed area.

Condition 23 of the permit requires the permittee to either revise Plate 5-2C or to remove a statement about the applicability of R645-200 to certain parts of the disturbed area. The statement has been removed and the plate renumbered as Plate 5-4.

### **Fish and Wildlife Habitat**

The reclamation plan, including species selection, meets the requirements of R645-301-342.

### **Findings:**

Information provided in the plan does not meet the minimum requirements of this section. Prior to final approval, the permittee must provide the following in accordance with:

**R645-301-341,** The permittee has committed to rip regraded areas to a maximum of two feet deep, but the plan needs to show a minimum ripping depth or other method of relieving compaction.

**R645-301-341**, Section 553.100 says all slopes steeper than 3h:1v will be gouged with a trackhoe, but Chapter 3 indicates some slopes may be treated with dozer tracking. This contradiction needs to be eliminated. Dozer tracking is not an acceptable treatment since it is likely to lead to smooth, steep slopes where rill and gully erosional features will develop.

**R645-301-341.210**, The permittee needs to clarify which seed mix will be used in the mitigation area above the mine site.

**R645-301-341.210**, The number of willows to be planted in the riparian area needs to be increased to about 4000 per acre. Because the entire area may not be suited for planting willows, the permittee may need to qualify the commitment based on appropriate planting areas.

**R645-301-356**, The permittee needs to either sample the pinyon/juniper and riparian areas in accordance with the Vegetation Information Guidelines requirements for final bond release or commit to selecting range site reference areas with cover at least as great as found in the disturbed area.

In addition, the plan says certain areas will be disced to incorporate fertilizer. Discing will probably reduce surface roughness and is highly discouraged. The Division also recommends broadcast seeding all areas since drill seeding tends to reduce surface roughness.

Responses to conditions on the permit relative to this section of the regulations are not due until the mid term of the permit. The only deficiency listed above that needs to be resolved quickly is to clarify which seed mix will be used for mitigation. Under this section of the regulations, the permittee has satisfied the requirements of conditions 15, 17, 18, 19, 20, 23, and 24.

The plan will need to show what type of mulch will be used prior to the mulch being applied. Interim revegetation seeding and mulching could occur in the fall of 1998.

#### **RECOMMENDATIONS:**

The permittee has satisfied several of the conditions in the permit, but other deficiencies remain. The proposed revision should not be approved until these deficiencies are resolved.



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June 15, 1998

TO: File

THRU: Joe Helfrich, Permit Supervisor

THRU: Daron Haddock, Permit Supervisor *10074*

FROM: Robert Davidson, Soils Reclamation Specialist *RAD*

RE: Topsoil Stockpile Amendment, Dugout Canyon Mine, Canyon Fuel Company, ACT/007/039-SR98-2, Folder #2, Carbon County, Utah

**TECHNICAL ANALYSIS:**

## RECLAMATION PLAN

### TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

**Analysis:**

Reclamation is extremely unlikely because of the poor quality of the indigenous soils found within the stockpile area. According to the Division's Guidelines for Topsoil and Overburden, the soils located in Pits SP-2 and SP-3 are identified as unacceptable for pH, soluble salts, sodium absorption ratio (SAR), and extractable selenium. Based on analytical results, these soils are classified as saline and sodic. Harmful effects of high levels of soluble salts usually results in poor seed germination and poor plant growth. Plant susceptibility is a function of plant species and toxic salt effects, limited water availability due to high osmotic concentration of the soil solution, and/or adverse physical or nutritional conditions caused by a high level of exchangeable sodium.

**Findings:**

The permittee must provide the following, prior to approval, in accordance with the requirements of:

**R645-301-133.710**, The applicant has not demonstrated that reclamation as required by the State Program can be accomplished according to the information given.

### RECOMMENDATION

The area identified should not be used for topsoil storage and should not be disturbed.