



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

Michael O. Leavitt
Governor
Ted Stewart
Executive Director
Lowell P. Braxton
Division Director

1594 West North Temple, Suite 1210
PO Box 145801
Salt Lake City, Utah 84114-5801
801-538-5340
801-359-3940 (Fax)
801-538-7223 (TDD)

July 22, 1998

TO: File

THRU: Daron Haddock, Permit Supervisor 

FROM: Paul Baker, Reclamation Biologist 

RE: Permit Application Package, West Ridge Resources, Inc., West Ridge Mine, PRO/007/041, Folder #2, Carbon County, Utah

SUMMARY:

West Ridge Resources, Inc., has submitted a permit application package to mine in the area southwest of West Ridge and north of East Carbon. Surface facilities would be mostly in C Canyon, but The applicant is also proposing a potential topsoil borrow site about one mile from the surface facilities.

The application includes an experimental practice proposal to bury, rather than salvage, topsoil in part of the proposed disturbed area. Other important issues include the presence of relatively large amounts of canyon sweetvetch, a sensitive species, and the proximity to three golden eagle nests.

TECHNICAL ANALYSIS:

ADMINISTRATIVE INFORMATION

IDENTIFICATION OF INTERESTS

Regulatory Reference: R645-301-112

Analysis:

West Ridge Resources, Inc., has applied for a permit to mine in an area north of East Carbon in Carbon County. The applicant is a corporation existing under the laws of Delaware and qualified to do business in Utah. The application shows the applicant's address, telephone number, employer identification number, and resident agent. The applicant will pay the abandoned mine reclamation fee.

The applicant is owned jointly by the Intermountain Power Agency (IPA) and by Andalex Resources, Inc. Names, addresses, and employer identification numbers of persons that own or control the applicant are in Section 112.300 and Appendix 1-7. Appendix 1-5 lists affiliated coal mining and reclamation operations and these operations' permit and MSHA numbers (where MSHA numbers are available) together with dates of issuance. This information will need to be checked through the applicant violator system.

Until 1995, IPA was involved with the Wellington Preparation Plant, so information about this operation needs to be included in the application.

In Section 112.500, the application lists surface and subsurface owners in the proposed permit area. Map 5-2 shows surface land ownership in the area, and Map 5-3 shows subsurface ownership. Surface owners in the proposed permit area are the Bureau of Land Management (BLM), the State School and Institutional Trust Lands Administration (SITLA), and Penta Creek, LLC. The BLM and SITLA are subsurface owners. The BLM, SITLA, and Penta Creek own contiguous property, both surface and subsurface.

MSHA numbers have not yet been issued, and they need to be included in the application as soon as they are available.

West Ridge Resources has applied for a lease by application in an area north and west of the proposed permit area. They have also obtained an option to acquire mining rights for adjacent State coal reserves.

Findings:

Information provided in the application 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:

R645-301-112.410, The application needs to include the names and other relevant information about affiliated coal mining and reclamation operations.

R645-301-112.700, MSHA numbers need to be included in the application as soon as they become available.

VIOLATION INFORMATION

Regulatory Reference: R645-301-113

Analysis:

Neither the applicant nor any subsidiary, affiliate, or any persons controlled by or under common control with the applicant has had a federal or state coal mining and reclamation permit suspended or revoked in the past five years, nor have they forfeited any performance bond or similar security.

Appendix 1-2 has a list of violations received by the applicant and associated entities within the three year period before the application date. MSHA numbers are not listed with the violations but can be found in Appendix 1-5.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations.

RIGHT OF ENTRY INFORMATION

Regulatory Reference: R645-301-114

Analysis:

The applicant holds federal coal lease SL-068754 and bases its right to enter most of the proposed permit area on language in the lease. The proposed topsoil borrow site is on land administered by SITLA, and the application says SITLA has issued a long-term special use permit for this area. The application also says this special use permit is pending. Also pending is a modification for the federal lease. Areas to be added to the lease include Township 14 South, Range 13 East, SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Sect. 10 and the NE $\frac{1}{4}$ NE $\frac{1}{4}$ of Sect. 15. The applicant needs to provide complete right of entry information for the entire proposed permit area.

Findings:

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

R645-301-114, The applicant needs to provide *right of entry information* for the entire proposed permit area.

UNSUITABILITY CLAIMS

Regulatory Reference: R645-301-115

Analysis:

The application says the proposed permit area is not within an area designated as unsuitable for mining, and West Ridge Resources is not aware of any petitions to designate the area as unsuitable for coal mining and reclamation activities.

The operations will not be conducted within 100 feet of an occupied dwelling, and the application contains a copy of letter from Carbon County granting permission to conduct mining and reclamation operations within 100 feet of the proposed C Canyon road. The letter includes certain stipulations:

1. Andalex (West Ridge Resources) should avoid any negative impacts to the road and should place a sign on the road indicating that a controlled access area lies beyond.
2. Ingress and egress from the county road to the mine facilities should be designed and constructed to provide maximum safety to public users of the road.
3. All mining operations adjacent to the road should be conducted in a manner that assures safety to the public.
4. Andalex (West Ridge Resources) will be responsible for maintenance of the portion of the road within the disturbed area.
5. Carbon County requires that Andalex (West Ridge Resources) leave the road in place and intact upon final reclamation and terminate the road at a parking/turnaround area for public use.

When coal mining and reclamation operations are proposed to be conducted within 100 feet of a public road, the Division is required to provide an opportunity for a public hearing in the locality of the proposed coal mining and reclamation operation for the purpose of determining whether the interests of the public and affected landowners will be protected. Although the road does not yet exist, it appears from discussions with West Ridge Resources that it desires to build the road and the mine concurrently. Therefore, the Division needs to provide an opportunity for a public hearing to determine whether the interests of the public and affected landowners will be protected.

Page 5
PRO/007/041
July 22, 1998

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations.

The Division needs to provide an opportunity for a public hearing in the locality of the proposed operation to determine whether the interests of the public and affected landowners will be protected from adverse effects of mining within 100 feet of the proposed road.

**PERMIT TERM, INSURANCE, PROOF OF PUBLICATION,
FACILITIES OR STRUCTURES USED IN COMMON, FILING FEE,
NOTARIZED SIGNATURE**

Regulatory Reference: R645-301-116, -117, -118, and -120

Analysis:

The application contains a general schedule for mining operations. The schedule shows construction beginning in October 1998 with mining starting in January 2000.

The term of the permit would be for five years.

Appendix 1-1, Attachment 1-1 contains a certificate of liability insurance that meets the requirements of the State Program.

Proof of publication has not yet been put in the application, but West Ridge Resources will need to include it when it becomes available.

There are no facilities or structures that would be in common with any other coal mining and reclamation operation.

A copy of the \$5.00 check for the filing fee is in the application, and the application also contains a statement with the notarized signature of Samuel Quigley that the information in the application is true and correct to the best of his information and belief.

For this portion of the technical analysis, the application was not reviewed for compliance with other aspects of the cited rules.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations. As soon as it becomes available, the proof of publication will need

to be included in the application.

ENVIRONMENTAL RESOURCE INFORMATION

LAND USE RESOURCE INFORMATION

Regulatory Reference: R645-301-411

Analysis:

According to the application, land uses in the proposed permit area have included grazing, wildlife habitat, coal mining, and recreational activities. The application says there are no agricultural activities, but grazing is considered an agricultural activity. This statement should be corrected.

Use of the land is limited largely by topography. There is an elevation change of about 2000 feet from the lowest to the highest parts of the proposed permit area. Steep-walled canyons, cliffs, and numerous large rocks on the slopes make other uses very difficult to impossible.

All but a small portion of the proposed permit area is in the Grassy Trail and Bear Canyon grazing allotments. The locations of these and other nearby allotments are shown on Map 4-1. The Bear Canyon and Grassy Trail allotments produce a total of 150 animal unit months of forage. In 1985, the Soil Conservation Service estimated production in the proposed disturbed area as 300 pounds per acre, but more recent estimates are in Chapter 3.

The area is zoned by Carbon County for mining and grazing use, and West Ridge Resources has obtained a conditional use permit from the county.

According to the application, previous mining consists of exploration activities in the proposed disturbed area where a total of less than one ton of coal was removed from the Lower Sunnyside Seam. This portion of the application should mention underground mining where an entry was driven from the southeast part of the proposed permit area.

In Section 411.130, the application says all of the 2751 acres in the permit area are controlled by the Bureau of Land Management, but it also says there is a small area of private land (surface only) on the east side of the proposed permit area. The School and Institutional Trust Lands Administration also owns property in the proposed permit area. Therefore, the statement that the BLM controls all land in the proposed permit area needs to be modified.

Findings:

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

R645-301-411, The statement that there are no agricultural activities in the proposed permit area needs to be modified. Grazing is considered an agricultural activity.

R645-301-411, The portion of the land use section that discusses previous mining activity needs to mention the entry driven from the southeast part of the proposed permit area.

R645-301-411, The application has a statement that the Bureau of Land Management controls all of the land in the proposed permit area. The School and Institutional Trust Lands Administration and a private entity also control part of the land.

HISTORIC AND ARCHAEOLOGICAL RESOURCE INFORMATION

Regulatory Reference: R645-301-411.140

Analysis:

There have been several archaeological studies done in the area including an intensive study done for this project in the area that would be disturbed by the mine. Other than the areas proposed to be disturbed, only a few relatively small areas have been surveyed within the proposed permit area.

No archaeological sites have been found within the proposed permit area. Eight sites are in nearby areas as shown on Map 4-2. One of these is a group of ruins north of Grassy Trail Reservoir, and the archaeological report says it should be considered eligible for listing in the National Register of Historic Places pending further research. None of the other sites are considered eligible. They consist of lithic scatters, old log cabins, and a trash dump.

Appendix 4-2 contains two letters from the Division of State History, one to the Bureau of Land Management and one to the State School and Institutional Trust Lands Administration. Both letters recommend a determination of no historic properties. Based on the information in the application, the Division should determine the mine will have no effect on archaeological resources.

The proposed permit area includes no cemeteries, trails in the National Trails System, rivers in the Wild and Scenic Rivers System, or public parks.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations.

VEGETATION RESOURCE INFORMATION

Regulatory Reference: R645-301-321

Analysis:

Vegetation information is in Chapter 3, Section R645-301-321, Appendices 3-1 and 3-5, and Maps 3-1, 3-2, and 3-3. Appendix 3-1 has a detailed vegetation study of the proposed mine site, and a study of the potential topsoil borrow area is in Appendix 3-5. Plant communities that could be affected by the proposed mine include pinyon/juniper, Douglas fir/maple, and Douglas fir/Rocky Mountain juniper. Sagebrush/grass and pinyon/juniper communities would be disturbed if the topsoil borrow area is used.

With the methods used for the vegetation studies, percentages of vegetative cover from both understory and overstory combined with litter, bare ground, and rock add to 100%. This method makes comparison of the reference and proposed disturbed areas much simpler than if the overstory and understory were kept separate.

The pinyon juniper community is mostly on the northwest side of the canyon and on both sides of the left fork. Most of the area sampled as "proposed disturbed" is not actually in the area proposed to be disturbed. Because of the ruggedness of the topography, it was very difficult to place the sampling points within the proposed disturbed area.

In the pinyon/juniper community, total cover was greater in the reference area than in the proposed disturbed area (52.83% compared to 47.93%), but the difference was not statistically significant. The report says woody plant density values were the same for the two areas although it does not give enough information for the Division to evaluate this statement. Production in both areas was estimated by the Natural Resources Conservation Service as 750 pounds per acre, and the range conditions were both rated as good. Adequate samples of vegetative cover were taken for both areas.

Because of differences in topography and elevation, there are greater differences between the pinyon/juniper reference area and the proposed disturbed pinyon/juniper area at the topsoil borrow area. The reference area is in C Canyon, but the potential topsoil borrow area is on a relatively level bench outside the canyon. However, according to the Division's calculations, these two areas are only slightly different statistically, and since the reference area has more cover than the proposed disturbed area, there should be no concerns about having too low of a

standard. There are some differences in species compositions, but these can be accounted for in setting diversity and other success standards.

Cover values were not statistically different between the proposed disturbed and reference areas for the Douglas fir/maple community. Production was slightly greater in the proposed disturbed area (1300 lbs. per acre) compared to the reference area (1200 lbs. per acre), but the range condition of the proposed disturbed area was only rated as fair while the range condition of the reference area was shown as good. The reference area had a greater number of species, and the proposed disturbed area had dogbane (*Apocynum cannabinum*), a species that indicates past disturbance. Canyon sweetvetch (*Hedysarum occidentale* var. *canone*) was encountered in both the proposed disturbed area and the reference area.

According to Map 3-2, the Douglas fir/maple reference area would be disturbed. If the reference area would actually be disturbed, the applicant needs to propose a different revegetation success standard. This is discussed under R645-301-341 below.

Species compositions in the proposed disturbed Douglas fir/Rocky Mountain juniper area and its corresponding reference area are very similar. The Division found a statistical difference in vegetative cover between the reference and proposed disturbed areas, but the applicant's consultant did not. This is because the consultant used a 95% confidence interval, but the Division used a 90% confidence interval. The proposed disturbed area had 75.75% vegetative cover where the reference area had 66.00% cover. The primary difference was that the proposed disturbed area had more cover from Douglas fir than the reference area. Production in both areas was the same, and both were in good range condition.

There were no statistical differences found between the proposed disturbed and the reference area for sagebrush/grass at the potential topsoil borrow area. The proposed disturbed area was in good range condition where the reference area was in fair condition. Both areas were estimated to have 800 pounds of annual production. Some the species in both areas are not desirable, but they do not constitute a major part of the cover.

In addition to the detailed studies of the proposed disturbed areas, the application includes a map showing vegetation communities in the entire permit area. Also, the applicant has committed to take aerial infrared photographs every five years to monitor the effects of underground mining on vegetation.

The vegetation measurements did not include cryptogams. Although cryptogams are not vascular plants, and some are not even plants, they can be an important component of the ecosystem. However, establishment of cryptogams is not required as a revegetation success standard, and the Division does not normally require cryptogam cover information. Because cryptogams probably contribute to the success of other species, it is conceivable that it would be necessary to establish cryptogams to promote the growth of vascular species to the levels of the success standards. This is not anticipated.

If the applicant's vegetation consultant visits the site again, such as to measure the vegetation for a new Douglas fir/maple reference area, the Division recommends that cover values for cryptogams be measured. The Division will attempt to have an expert in cryptogams visit the site to evaluate it and give recommendations about reestablishing this component of the soil ecosystem.

Findings:

Information provided in the proposal is considered adequate to meet the requirements of this section of the regulations. The Division recommends that the applicant measure cover from cryptogams.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: R645-301-322

Analysis:

Wildlife Information

Appendix 3-3 has a list of wildlife species potentially occurring in the proposed permit area. Maps 3-4A, B, C, and D show information about raptor nests and deer, elk and antelope habitat.

There are several golden eagle, falcon, and buteo nests in and near the proposed permit area. Three eagle nests were found in C Canyon. The text should be updated to include the most recent information about the status of the nests from the 1998 raptor survey. The application should also mention the peregrine falcons found in the area although these locations should not be shown on any maps.

The proposed mine site includes high value deer and elk winter habitat. The potential topsoil borrow area contains critical deer winter range, and much of the proposed permit area, not including the area that would be disturbed by surface operations, contains critical deer summer range. No pronghorn habitat is shown as being in the proposed permit area.

About 360 species potentially exist in and near the proposed permit area, and the application includes relatively general information about several of these species. The only wildlife information gathered for the purpose of the application is the raptor nesting information.

It is unlikely the mine will affect bat concentration areas since few if any cliffs will be affected during construction. Besides the raptors, there are no other bird species that are likely to be significantly adversely affected by the mine. The application says there are no perennial

streams, wetlands, or riparian areas within the proposed permit area. For this reason, the value for wildlife is restricted, and there are no amphibians or fish that are likely to be affected. While snakes inhabit the area, there is no known critical habitat.

Despite the lack of wildlife studies done for the proposed project, the information in the application is probably adequate. However, before making a final determination about the adequacy of wildlife information, the Division will need to receive formal comments from the Division of Wildlife Resources.

Threatened or Endangered Species

The application contains a letter from the Fish and Wildlife Service identifying eight listed and candidate threatened or endangered species that could occur in Carbon County. The application contains a statement in Sections 322.210 that the letter from the Fish and Wildlife Service states that no federally listed threatened or endangered species are known to occur in the project area. This statement is not correct and needs to be modified. The letter only provides a list of species reported from Carbon County and does not make a finding whether these species could occur in the project area. Section 333 under R645-301-330 contains a similar statement that also needs to be modified.

The only species likely to occur in the permit area are the bald eagle and peregrine falcon. There are only four known bald eagle nests in Utah, and the closest is near Castle Dale. Most bald eagles in Utah spend the winter but do not breed here.

Peregrine falcon nests have been found at mines in the Wasatch Plateau, but none were found in the raptor survey. Assuming the application is approved, the applicant will need to conduct further surveys to look for nesting activity of all raptors, including peregrines. If found, protection or mitigation plans would need to be developed.

Although there are no fish in the proposed permit area, the mine has a potential, through water depletion, of adversely affecting threatened or endangered fish of the Upper Colorado River. This issue is addressed as part of the fish and wildlife protection plan.

The letter from the Fish and Wildlife Service includes Graham beardtongue (*Penstemon grahamii*) as a candidate species that occurs in Carbon County. According to Ben Franklin of the Utah Natural Heritage Program, there is a historical collection of this species in the extreme northeastern corner of the county a few hundred feet from the county line. It is an endemic that occurs almost exclusively on the Green River formation in Uintah and Duchesne counties. There is virtually no likelihood the mine would affect this species.

Canyon sweetvetch is no longer a candidate threatened or endangered plant species, but it is on the Bureau of Land Management's list of sensitive species. It is relatively common in the area of the proposed mine as documented in the vegetation studies.

The application says the burrowing owl is not expected to be found within the permit area as they use prairie dog burrows as nest sites; however, the Fish and Wildlife Service commented that they also use badger and marmot burrows for their nest sites. It is not anticipated, though, that the proposed permit area contains suitable habitat.

Findings:

Information provided in the application 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, The applicant needs to update the application text and show the status of raptor nests in the proposed permit and adjacent areas. It should also discuss the peregrine falcons found in the area (10-mile radius) although the locations of these birds and/or scrapes should not be shown.

R645-301-322, There are statements in section 322.210 and section 333 under R645-301-330 indicating the letter from the Fish and Wildlife Service letter in Appendix 3-4 says there are no threatened or endangered species known to occur in the project area. These statements need to be modified since the Fish and Wildlife Service letter only provides a list of species that could occur in Carbon County.

In addition, before making a final determination about the adequacy of wildlife information, the Division will need to receive comments from the Division of Wildlife Resources.

OPERATION PLAN

AIR QUALITY

Regulatory Reference: R645-301-420

Analysis:

The application is required to show the coordination that has been undertaken with the Division of Air Quality to comply with the requirements of the Clean Air Act. The application says the applicant is in the process of applying for an air quality permit. This satisfies the requirements of this regulations for the present, but the application will need to be updated as a notice of intention is filed and the approval order is given.

Findings:

Information provided in the application is considered adequate to meet the requirements of this section of the regulations. However, the application will need to be updated as steps are taken to receive an Air Quality Approval Order.

INTERIM STABILIZATION

Regulatory Reference: R645-301-331

Analysis:

The plan for interim revegetation is to seed the mixture shown in Table 3-3 in late fall or early spring on topsoil stockpiles and regraded slopes. Among the areas that would be seeded are the outslope of the sediment pond, fill slopes, and side slopes.

The amounts of alfalfa and sweet clover in the interim seed mix are excessive and should be reduced to about one pound of pure live seed per acre.

A few other species, such as Kentucky bluegrass, bluebunch wheatgrass, Indian ricegrass, blue flax, yarrow, and Louisiana sage, could be added to the mix. Not all of these species are needed, but a few should be included. They are all natives, and, once established, should provide good erosion protection.

Canyon sweetvetch is included in the seed mix for final reclamation, but it is not shown in the seed mix for interim revegetation. While it is expected the seed of this species will retain its viability for relatively long periods, most of the seed collected in 1997 will probably not still be viable when the mine is reclaimed.

The application mentions the possibility of seeding topsoil piles with canyon sweetvetch seed, but it also says the interim seed mix could be used on the topsoil piles and that they could be used as revegetation test plots. The section on experimental practices discusses using part of the topsoil pile in the right fork as a test plot to compare certain reclamation techniques.

The application needs to clarify what revegetation methods, particularly what seed mixtures, would be used on the topsoil piles. If built, the topsoil stockpile in the left fork could be used as a nursery for canyon sweetvetch, but a few other non-competitive species, such as bluebunch wheatgrass or Indian ricegrass, should be planted with it. In case the initial seeding failed, not all of the seed gathered in 1997 should be used at once. The remainder of the seed should be stored in controlled conditions. Generally, room temperature or slightly cooler temperatures with moderate relative humidity work well. High temperatures with high humidity will kill the seed. Any area planted with canyon sweetvetch will need to be monitored closely. If the applicant does not build the stockpile in the left fork, another location will need to be found to plant some of the seed.

The topsoil stockpile in the right fork would not be needed as a test plot for about ten years, so it could be planted with the interim mix to begin with. All other areas to be redisturbed should also be planted with the interim mix.

In Section R645-301-341, the application says the interim seed mixture will be hand broadcast and the areas raked to cover the seed. Interim revegetation areas should also be mulched, but the application does not indicate they will be mulched. The application should also mention what surface preparation and fertilization methods will be used. It could refer to the final reclamation plan.

This rule requires the applicant to minimize disturbance. As far as possible the applicant needs to avoid using the topsoil borrow area.

Findings:

Information provided in the application 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:

R645-301-331, The amounts of alfalfa and sweet clover shown in the interim seed mixture are excessive and should be reduced to about one pound of pure live seed per acre. Several other species could also be used in the interim mix to increase diversity and provide better erosion protection.

R645-301-331, It is not clear what seed mix will be used on the topsoil piles. The seed of canyon sweetvetch that was collected in 1997 will need to be planted somewhere so seed can be raised for use in final reclamation, and the application indicates the topsoil piles may be used. However, the application also mentions the topsoil piles could be used for test plots and that the interim revegetation seed mixture could be used there. In addition, the application should show what mitigation is being done for canyon sweetvetch.

R645-301-331, Other than the seed mixture and seeding methods, the application needs to show what methods would be used for interim revegetation, such as surface preparation, fertilization, and mulching.

FISH AND WILDLIFE RESOURCE PROTECTION

Analysis:

Power lines will be designed and installed using raptor-proof designs. Hunting platforms could be installed on select poles.

Areas in the proposed permit area containing potential raptor nesting habitat will be surveyed in the field within one year of any mining activity that could result in subsidence. Should any nests be found, the applicant would consult with the Division and with DWR. The applicant would also need to consult with the Fish and Wildlife Service.

Surface water quality will be protected using sedimentation controls. The sediment ponds will be monitored for any adverse effects on wildlife, and these effects would be reported to DWR. Should mining disrupt a seep or spring that was utilized by cattle or wildlife, the applicant would replace the quantity of water depleted from that source at a similar location unless the seep is restored naturally in a nearby area.

As mentioned above, there are three golden eagle nests in C Canyon near the proposed mine. One of these in the right fork had been tended in 1997. The tended nest is within one-half mile of the proposed mine site, but the application says, and DWR confirmed, the nest is not within line of site of the proposed mine. However, the application says DWR recommended that construction not occur in the upper part of the mine in the time period from February 1 through July 15. The applicant needs to commit to not begin construction in this time period unless monitoring shows the nests are not active.

In the left fork of the canyon is a nest that was inactive in 1997, and much of the proposed minesite is within one-half mile of this nest. The application says DWR recommended obtaining a "take" permit for this nest and that the applicant is pursuing this option. The Division has received a copy of the application for this permit. However, according to verbal information from the Fish and Wildlife Service, it may not be necessary to acquire this permit, and they have not yet established a firm policy about this type of situation. For now, the application can be considered adequate.

The construction schedule for the mine indicates the applicant would begin in October of 1998. Assuming this schedule is followed, there should be no effect on nesting birds, such as causing them to abandon their nests. However, the nest in the left fork of C Canyon is close enough to the mine site that it would probably not be used during the life of the mine.

As mining begins, the applicant would need to continue to monitor the nests in the area and may need to obtain additional take permits. It may also be necessary to preclude birds from nesting in particular places because of the potential of losing the nests through cliff spalling or other results of subsidence. At other mines, chain link fencing material has been put over nests to keep birds away.

Through water use, the mine has the potential of adversely affecting threatened and endangered fish of the Upper Colorado River. In Appendix 7-7, the application includes estimates of how much water will be used, and it is less than one hundred acre feet per year. Above one hundred acre feet per year, the Fish and Wildlife Service would require a mitigation fee. A final determination of effect will need to be made by the Office of Surface Mining, Reclamation and Enforcement in consultation with the Fish and Wildlife Service.

The site for potential topsoil borrow is in critical deer winter range, and the applicant needs to commit to mitigate for this potential disturbance. Because the site may not be disturbed, it is not necessary to perform the mitigation or pay for it now, but the applicant should commit to doing the mitigation if the site is ever disturbed.

The Division requires enhancement or avoidance for areas of critical habitat, but it is understood the Bureau of Land Management requires mitigation for areas of high priority habitat as well. The mine site is in high priority habitat.

Some of the greatest effects on wildlife would be from the proposed road. While it does not appear the Division will have jurisdiction over most of the road, drivers need to be instructed on the importance of maintaining a proper speed through the area and of removing any big game animals killed as far as possible from the road. Killed animals should also be reported to DWR. By removing these carcasses or keeping them as far away from the road as possible, the risk of collisions with eagles, other raptors, and vultures can be reduced.

The applicant needs to commit to conducting wildlife education session for its and its contractors' employees. Many conflicts with wildlife can be avoided through knowing what actions may be detrimental or beneficial.

Findings:

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

R645-301-333, The applicant has committed to consult with the Division and with Wildlife Resources about what actions to take if there is a raptor nest in an area that will be subsided. The Fish and Wildlife Service also needs to be consulted.

R645-301-333, The applicant needs to commit that construction will not be initiated in the upper part of the mine in the time period from February 1 through July 15 unless monitoring shows there are no active raptor nests.

R645-301-333, The potential topsoil borrow area is in critical deer winter range, and the applicant needs to commit to mitigate for the disturbance. It is recognized the

disturbance may never occur, so it is not necessary to actually perform the mitigation at this time.

R645-301-333, The applicant needs to commit to conduct wildlife education sessions for its and its contractors' employees.

It may be necessary to make additional requirements after the Division receives comments from the Division of Wildlife Resources.

RECLAMATION PLAN

LAND USE RECLAMATION PLAN

Regulatory Reference: R645-301-412

Analysis:

The applicant proposes no changes to the existing land uses. The application includes copies of comments from the Bureau of Land Management and the School and Institutional Trust Lands Administration supporting the proposed and current land uses.

Carbon County requires that the access road be left following mining, including that portion in the proposed permit area. In its letter commenting on the postmining land use, the BLM did not mention the road. Use of the road can be considered as part of the current land uses, but the Division needs to know the land owner understands and accepts that the road will remain following reclamation.

Findings:

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

R645-301-412.200, Comments from the Bureau of Land Management need to show their understanding of and support for leaving the road following reclamation.

REVEGETATION

Regulatory Reference: R645-301-341

Analysis:

Revegetation Plan

The revegetation plan is primarily in Section R645-301-341. Three revegetation scenarios are shown, one for areas where topsoil would be salvaged and redistributed, one for areas with topsoil that is covered with a geotextile, and one for rock/rubbleland areas. In the rock/rubbleland areas, there are a few areas where topsoil would be salvaged and later replaced.

In areas where the topsoil is salvaged and redistributed, fill will be removed until approximate original contour is achieved, topsoil will be replaced, a weed-free straw mulch would be applied at the rate of 2000 pounds per acre, fertilizer would be added if deemed necessary, the surface will be gouged, the seed mix will be broadcast seeded or hydroseeded, the area will be mulched with 4000 pounds per acre of straw, and a tackifier will be applied. As an alternative to the tackifier, SoilLok or a polyacrylamide (PAM) may be used. The same methods will be used in rock/rubbleland areas except that soil will not need to be replaced.

The Division is concerned about using fill in rock outcrop/rubbleland areas without first salvaging soil and without a plan to restore the landscape diversity. The methods proposed in the plan are likely to lead to slopes that have few areas of exposed large rocks with few protected areas between the rocks. Under the proposed plan, areas between the rocks would be filled and would not be available for wildlife habitat. Large rocks, in addition to providing wildlife habitat, create local areas of concentrated runoff and cooler temperatures where species can become established that would not survive if the site was uniform. The applicant needs to show how these conditions will be restored to obtain the vegetation diversity and wildlife habitat required.

It appears the first mulch being applied, 2000 pounds per acre of straw, is more of a soil conditioner than a mulch. Alfalfa hay would work much better for this purpose than straw since it contains more nitrogen and would not be as much of a nitrogen sink.

Using 4000 pounds per acre of straw for mulch is a little more than needed, but it should still work. A more desirable rate is 3000 pounds per acre. With the tackifier, the applicant should plan to apply wood fiber hydromulch at the rate of about 500 pounds per acre.

The Division is not familiar with using PAM or SoilLok as tackifiers, but it appears SoilLok has been used for this purpose. Rates of application of traditional tackifiers is well established, but application rates for Pam and SoilLok are not as well known. Before using these products, the applicant needs to show what application rates would be used and how these products would be applied.

In the experimental practice areas where topsoil is left in place and is covered with a geotextile, PAM would be applied to the soil surface after it is exposed. The surface would then be perforated with the teeth of a backhoe bucket to a depth of about eight inches to relieve

compaction and allow water infiltration. The area would then be seeded, the seed raked in, PAM would be applied a second time, and weed-free straw would be applied at the rate of 4000 pounds per acre and held to the surface with a tackifier. Finally, transplants would be planted in some areas.

PAM does not reduce soil compaction, and it only increases infiltration by keeping already-formed soil aggregates together. In a massive compacted soil, PAM would have little effect. Therefore, while the Division initially recommended this treatment, it now appears it would not be beneficial and would possibly even be detrimental. The applicant intends to use PAM in the test plots, so it will be possible to determine what effects it will have on revegetation and soil conditions prior to reclamation. If the effects are negative, it will be necessary to delete this treatment from the plan.

Instead of simply perforating the soil surface with the teeth of a backhoe, it is recommended the applicant gouge the experimental practice areas in the same manner as other parts of the proposed disturbed area. The Division has seen slopes as steep as 1.5h:1v successfully gouged without destabilizing the slopes.

The same soil amendment used in other areas, hay applied at the rate of 2000 pounds per acre, could be used in the experimental practice area.

Toward the end of Section R645-301-341 is a paragraph discussing other possible methods of roughening the surface. Although these other methods could be used and would be acceptable if applied properly, they are rarely done correctly. For this reason, they usually lead to erosion problems and less revegetation success than would otherwise be expected.

Section 341.230 contains a statement that straw mulch will be held in place with a chemical tackifier applied at the rate of 500 pounds per acre. This is an excessive rate for applying tackifier; it is probably meant to be the rate of wood fiber mulch application with the tackifier over the straw.

The seed mixes to be used in final reclamation are in Tables 3-2A, B, C, and D. For the most part, these seed mixes are acceptable, but the Division recommends some modifications as discussed below. Yellow sweet clover is the only species in the mixes not native to Utah, and it serves to help reestablish microorganisms. It also competes with weeds during early stages of revegetation.

(Throughout the following discussion, seeding rates are considered pure live seed.)

At the proposed mine site, the plan text says seed will be broadcast seeded. The tables containing the seed mixes indicate the rates of seed application are broadcast rates, but footnotes with the tables say they are drill rates and that the rates will be doubled if the seed is broadcast. This needs to be clarified. The "Interagency Forage and Conservation Planting Guide for Utah"

recommends broadcast seeding at a rate of about 50-100 seeds per square foot with rates cut by one-fourth to one-half for drill seeding. The lowest seeding rate obtained by planting the seed mixes as shown would be about 65 seeds per square foot (the numbers of seeds per pound were estimated for some species), and the highest would be about 89 seeds per square foot. Doubling these rates for broadcast seeding would be excessive; the rates shown are adequate for broadcast seeding. Adding a few species to each mix as recommended below would still be acceptable.

The mixture shown in Table 3-2A is for use in pinyon/juniper areas. Sandberg bluegrass (*Poa secunda*) is the dominant grass in these areas and should be included in the seed mix at a rate of about 0.5 pounds per acre. Bitterbrush (*Purshia tridentata*) could also be included at the rate of one pound per acre.

Muttongrass (*Poa fendleriana*) and Indian ricegrass (*Stipa hymenoides*) could be added to the mix for the Douglass fir/maple community shown in Table 3-2B. Recommended rates would be about 0.3 and two pounds per acre, respectively.

Serviceberry (*Amelanchier alnifolia*) and mountain mahogany (*Cercocarpus ledifolius*) line many areas of the undisturbed streambank in a manner similar to willows along perennial streams. The applicant has proposed seeding mountain mahogany in these areas, but the Division recommends using transplants, probably gallon containerized plants planted in the fall at about five-foot spacing, along the reclaimed channel.

Muttongrass could also be added to the mix for the Douglas fir/Rocky Mountain juniper community shown in Table 3-2C. The recommended rate would again be 0.3 pounds per acre. Also in this mixture, the applicant needs to specify which subspecies of sagebrush would be used. Mountain big sage (*Artemisia tridentata*, var. *vaseyana*) is probably the species in the area although it could be Wyoming big sage (*A. t.* var. *wyomingensis*).

Douglas fir would be planted in Douglas fir/Rocky Mountain juniper areas both from seed and transplants. Since Douglas fir is a common tree grown for timber, it is likely that plants inoculated with ectomycorrhizae are available commercially. Using inoculated plants is suggested but not required.

In the seed mix for the topsoil borrow area, needle and thread grass (*Stipa comata*) and black sage (*Artemisia nova*) should be added at the rates of about two and 0.5 pounds per acre, respectively.

The applicant does not intend to irrigate but, instead, will use water harvesting methods. Irrigation should not be necessary at this site.

Pesticides will only be used if a problem is identified and spraying is deemed necessary to control damage to reclamation. The area does not have heavy infestations of noxious weeds at this time, so it is not anticipated herbicides will be needed. The use of other pesticides would

depend on what problems are encountered, but none are foreseen.

Revegetation Success Standards

As discussed in the vegetation information section, there are few differences between the reference areas and the proposed disturbed areas. The only significant difference where the proposed reference area has less cover than the proposed disturbed area is in the Rocky Mountain juniper/Douglas fir community. The vegetative cover values were statistically different at 90% but not at 95% confidence. Constructing a 90% confidence interval allows 66.53% cover, and the actual value is 66.00%. If one performs a natural logarithm transformation of the data, there is no statistical difference.

Other than cover, every aspect of the proposed reference and disturbed areas in the Rocky Mountain juniper/Douglas fir community is the same or very similar, including species composition, aspect, slope, soils, productivity, and range condition. Considering there is no difference in cover if one does a natural log transformation of the data, it is felt the similarities outweigh the one possible difference in this case, and the difference is felt to be minor if it exists.

According to Map 3-2, the Douglas fir/maple reference area would be disturbed, so this area, obviously, cannot be used as a reference area. The applicant could combine the data from the two areas and use this as a baseline vegetation success standard or a new reference area could be established in this community. Before proposing to use the data in the application as a success standard, the applicant would need to ensure that adequate samples were taken.

The application says Appendix B will be used for calculating diversity. It is assumed this reference is to Appendix B of the Vegetation Information Guidelines. Although at least one of the methods (the Ruzicka index) in this appendix would provide an acceptable means for measuring diversity, the applicant also needs to propose a standard and show what measurement, such as cover or production, would be used to calculate the Ruzicka index.

The two similarity indexes in Appendix B are used for showing similarity in species composition, and reclaimed sites commonly have different species complements than undisturbed areas. Therefore, a direct comparison is not usually appropriate. Also, the similarity indexes do not show whether one or a few species dominate.

Erosion control would be judged using the "Erosion Condition Classification System" originally developed by the Bureau of Land Management and modified by the Office of Surface Mining. Reclamation would be considered successful if soil surface factor values were the same as or lower in the reclaimed areas as in adjacent undisturbed areas.

The application needs to show success standards for seasonality and a method for measuring this parameter. It should also contain a discussion of how the species will meet the requirements to be permanent, capable of regeneration and plant succession, and compatible with

the postmining land use.

For areas with a postmining land use of wildlife habitat, the Division is required to consult with State wildlife agencies and gain approval for tree and shrub establishment success standards. The Division has consulted with the Division of Wildlife Resources and developed standards. These are based primarily on existing conditions and take into account the species that contribute to the woody plant densities in the various areas. In the sagebrush/grass area, the numbers of woody plants in both the proposed disturbed and reference areas are considered excessive. The established standards in numbers of woody plants per acre are:

Pinyon/Juniper	800
Douglas Fir/Maple	2000
Douglas Fir/Rocky Mountain Juniper	2500
Sagebrush/Grass	2500

These standards need to be included in the application.

Table 3-4 of the application is a revegetation monitoring schedule. Qualitative observations would be done every year after seeding, but quantitative observations would be done only in the years specified. Productivity measurements in final reclamation areas would be done in the eighth and ninth years, but the applicant needs to include productivity measurements in the tenth year.

All other final reclamation monitoring is adequate, but it is probably more than actually needed. Second year quantitative monitoring could probably be deleted. The applicant might want to do interim quantitative monitoring as needed to determine whether remediation is necessary rather than committing to a specific schedule.

The test plots would also be monitored according to the schedule in Table 3-4. This intensive monitoring is appropriate for test plots.

In Sections 341.300 and 342.100, the application indicates native species have become reestablished in disturbed areas without seed or mulch application or surface preparation. While the Division does not know precisely what reclamation efforts have been undertaken in this area, there are stands of introduced grasses that have the appearance of having been seeded.

Field Trials

Information about test plots is in Section 231.300. In an area near the topsoil pile in the right fork, an area will be covered with geotextile and fill, in this case topsoil, in a manner similar to the rest of the experimental practice area. It will be left in place for about five years after which the soil will be exposed. The fill--topsoil--will be moved to a part of the topsoil stockpile where it can be subjected to the same treatments as the soil left in place and covered with the

geotextile and fill.

Each of the two test plots, the topsoil and the geotextiled soil, will be divided in half with one half receiving an application of PAM. Next, each half would be further divided in half with one of each of these halves being treated with an organic soil activator and the other half left untreated. The areas will then be seeded, the seed raked in, and the areas will be mulched with 3000 pounds per acre of straw followed by application of a tackifier.

The eight test plots will be monitored for five years and compared with each other and the Douglas fir/maple reference area. The revegetation plan will be revised as necessary to incorporate the best practices used in the test plots.

Wildlife Habitat

According to the application, reclamation of the disturbed area following mining activities will result in the restoration of the environment for wildlife habitat, such as small mammals and reptiles, and for grazing. This statement needs to be modified. While reclamation is intended to restore the postmining land uses at a level approximately equal to what they were before disturbance, restoration implies bringing the site back to the exact premining condition.

Plant species in the seed and planting mixtures were selected on the bases of forage nutrition and cover values and adaptability to the environment. As discussed above, the Division recommends certain species be added to the mixtures. While the species in the proposed seed mixtures and in the recommendations are not all identical to those currently existing on the site, they are similar and may enhance the value of vegetation for wildlife.

The application says Appendix 3-6 contains comments from the Division of Wildlife Resources about additional wildlife enhancement measures and that the applicant has incorporated several of their suggestions in the permit application package. Appendix 3-6 does not contain comments from Wildlife Resources, and the Division will need to receive comments about what habitat enhancement opportunities are available for this site.

The applicant intends to do off-site mitigation in the form of either shrub plantings or pinyon and juniper removal. According to the application, Wildlife Resources, the BLM, and SITLA are supportive of these options, and the habitat enhancement would be done on State land. The application refers to Appendix 3-6 for evidence of SITLA's support of the proposal, but this appendix is empty.

Findings:

Information provided in the proposal 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:

R645-301-341, The applicant needs to show how landscape diversity, and thus vegetation diversity and wildlife habitat, will be restored.

R645-301-341.210, The applicant needs to clarify seeding rates. Footnotes to the seed mixture tables indicate the rates shown are for drill seeding and that they would be doubled for broadcast seeding; however, the tables also say the rates are for broadcast seeding.

R645-301-341.210, The applicant needs to specify which subspecies of sagebrush would be seeded.

R645-301-341.230, The application says in Section 341.230 that tackifier will be applied at the rate of 500 pounds per acre, and this is probably a mistake. Normally, wood fiber hydromulch would be applied at this rate together with a tackifier to anchor another mulch. This section should be clarified.

R645-301-341.230, The applicant intends possibly to use a polyacrylamide (PAM) or SoilLok as a tackifier. It appears these would work as tackifiers, but the applicant needs to supply further information about application rates.

R645-301-341.250, According to Map 3-2, the Douglas fir/maple reference area would be disturbed, so this area cannot be used as a reference area. The applicant needs to propose a different success standard.

R645-301-341.250, The applicant needs to provide further information about the diversity success standard, such as exactly what method would be used and what the standards are. The application also needs to show how other revegetation performance standards, such as seasonality, utility for the postmining land use, permanence, and capability for regeneration and succession, will be measured and what standards will be used.

R645-301-341.250, The Division has developed woody plant density success standards, and these have been approved by the Division of Wildlife Resources. These standards, as discussed in this technical analysis, need to be included in the application.

R645-301-341.250, Table 3-4 contains a schedule for monitoring vegetation after final reclamation. This table needs to include measurement of plant productivity in the tenth year following reclamation.

R645-301-342, Section 342.100 of the application indicates wildlife habitat will be restored following reclamation. This statement needs to be modified. Restoration implies the site will be made to be exactly as it was before disturbance.

R645-301-342, In reclamation, the applicant needs to use the best technology currently available to enhance wildlife habitat. The application needs to show how this performance standard is being achieved. The application references Appendix 3-6 for comments about the reclamation plan from Wildlife Resources. This appendix should also contain comments from the School and Institutional Trust Lands Administration about a habitat mitigation plan; however, the appendix is empty.

There are a few other problems in the application that are not considered deficiencies but for which the Division offers recommendations.

1. The application says straw mulch would be mixed into the soil as it was being gouged in all but the experimental practices area. Hay should be used instead of straw.
2. Some wood fiber mulch, about 500 pounds per acre, should be mixed with the tackifier to hold the straw mulch on the surface (not the mulch being mixed in).
3. The mulch rate could be reduced from 4000 to 3000 pounds per acre.
4. Rather than just being perforated with the teeth of a backhoe, the geotextiled areas should be gouged as long as they remain stable.
5. Methods other than gouging can be used successfully to roughen the surface, but they are not generally applied properly. For this reason, they are not recommended.
6. The Division recommends several changes to the seed mixes for final reclamation.
7. It is recommended that mountain mahogany and serviceberries be planted along the reclaimed channel.
8. Douglas fir transplants inoculated with ectomycorrhizae are probably available commercially, and the Division recommends using these to increase establishment and subsequent growth.

RECOMMENDATIONS:

The application should not be approved until the deficiencies discussed in this

Page 26
PRO/007/041
July 22, 1998

memorandum are resolved.

O:\007041.BCN\FINAL\WRBIOTA.PBB