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State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

ACT/007/012

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August 5, 1997

TO: File

THRU: Daron Haddock, Permit Supervisor *DRH*

FROM: Paul Baker, Reclamation Biologist *PAB*

RE: Wellington Technical Analysis, Nevada Electric Investment Company,
Wellington Preparation Plant, ACT/007/012, Folder #2, Carbon County, Utah

SUMMARY:

On October 30, 1996, the Division received a response to its July 25, 1996 technical analysis of the operation and reclamation plan for the Wellington Preparation Plant. This document represents a complete analysis of assigned portions of the plan.

ANALYSIS:

ADMINISTRATIVE FINDINGS

IDENTIFICATION OF INTERESTS, VIOLATION INFORMATION, AND RIGHT OF ENTRY INFORMATION

Regulatory Reference: R645-301-112, -113, -114

Analysis:

Identification of Interests

Section 1.00 of the Operation and Reclamation Plan (ORP) discusses much of the history of the Wellington Preparation Plant. It was originally established in 1958 by United States Steel and was sold to Kaiser Steel in 1986. The plant was purchased by Genwal Coal Company in 1989. Subsequent owners, permittees, and operators have included Castle Valley Resources Company, the Intermountain Power Agency, and Nevada Electric Investment Company (NEICO).

The plan identifies NEICO as the applicant and operator. NEICO is the permittee, and the resident agent is Patrick D. Collins. The entity responsible for paying the Abandoned Mine Land Reclamation Fee is NEICO. NEICO owns the land upon which operations will occur.

The directors and officers of NEICO are shown in Section 112.310. Nevada Power Company owns 100% of the stock of NEICO, and Nevada Power's officers and directors are presented in Section 112.312.

The plan shows each additional name and identifying number, including employer identification number, Federal or State permit number, and MSHA number with date of issuance, under which the person owns or controls, or previously owned or controlled, a coal mining and reclamation operation in the United States within five years preceding the application date. NEICO has owned or controlled coal mining and reclamation operations under the names of Genwal Coal Company and Castle Valley Resources.

NEICO is identified as the legal owner of areas to be affected by the surface operator and facilities. According to the text of the plan, Earthco holds equitable title to this land. The July 3, 1997, submittal includes copies of plats from the Carbon County Recorder's Office, and these indicate Genwal Coal Co., Inc., owns at least large portions of the land in the permit area. However, a separate land ownership map included with the July 3 submittal, designated Drawing No. E9-3341B, indicates NEICO is the land owner for the entire permit area. In addition, the permittee has not proposed to delete the land ownership map in the current plan, and it shows a joint operations area owned by NEICO and IPA and a larger area owned by Genwal Coal Company. The land ownership information needs to be corrected so it is consistent on the various maps and in the text.

Section 112.600 shows the names and addresses of owners of surface lands contiguous to the permit area. Since no coal will be mined, the application does not show the owners of coal within the permit area.

Holders of leasehold interest include MCI and the D&RGW-Southern Pacific Railroad.

Violation Information

Violation notices are listed from 1991 through 1993. An AVS check was completed on November 8, 1994 by the Division.

Right of Entry

NEICO obtained the right to enter and begin mining and reclamation activities through a series of agreements. By virtue of an agreement dated July 1, 1991, and executed July 11, 1991, the Intermountain Power Agency (IPA) and NEICO jointly owned portions of the Wellington Preparation Plant on the west side of the Price River. The remainder of the property was owned by NEICO. At this time, Castle Valley Resources operated the plant, but Genwal later operated it. The permit was transferred to NEICO on April 8, 1994, and on January 11, 1995, IPA deeded to NEICO its interest in the joint ownership area which made NEICO the sole owner.

Findings:

Information provided in the proposed amendment 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:

R645-301-521.130, The plan needs to contain a map showing the owners of surface lands within and contiguous to the permit area. Maps and text in the plan need to have consistent information. Maps in the July 3, 1997, submittal conflict with each other. These maps and a map and the text of the current plan conflict with each other.

UNSUITABILITY CLAIMS

Regulatory Reference: R645-301-115

Analysis:

No unsuitability claims were made for the described permit area. The permittee has provided approvals from Carbon County to conduct mining and reclamation operations within 100 feet of a public road.

Findings:

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

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

Regulatory Reference: R645-301-116, -117, -118, -123

Analysis:

Permit Term

The NEICO permit became effective on April 18, 1994, as a result of a transfer and expired on December 10, 1994. A copy of the permit was signed by Richard L. Hinckley, Vice President, NEICO. A permit renewal was issued on December 10, 1994 for a five-year permit term.

Insurance

Proof of insurance was provided with an affidavit from the Price Insurance Agency. On November 20, 1996, the Division received a new certificate of liability insurance from the Price Insurance Agency. The policy expires November 1, 1997, and the insurers are Earthco, Nevada Electric Investment Company, and Nevada Power.

Proof of Publication

Proof of Publication was presented for the notice published on January 4, 1994 in the Sun Advocate.

Facilities or Structures Used in Common

No facilities or structures are used commonly with any other issued permit. However, the Plant Refuse Pile is approved to accept waste from the Genwal Sedimentation Pond.

Notarized Signature

A notarized signature from Richard L. Hinckley, Vice President of NEICO, was provided, committing NEICO to comply with all laws of Utah and obligations associated with the permit on September 28, 1994.

Findings:

Information provided in the proposal is considered adequate to meet the

requirements of this section of the regulations.

ENVIRONMENTAL RESOURCE INFORMATION

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

Regulatory Reference: R645-301-411.140

Analysis:

There are no known cultural and historic resources or archeological sites in the immediate area. The plan says the application was found in compliance with the National Historic Preservation Act by the Utah Historic Preservation Office on December 6, 1982. It also indicates that there are no public parks or cemeteries within a hundred feet of the permit area and that there are no lands in the permit area within a unit of National System of Trails or within the Wild and Scenic Rivers System or Study Areas.

The Division's permit documents confirm the permittee's statement presented in the plan. An apparent completeness review was completed on December 6, 1982, which did not require an additional request for information. However, no document could be found from the Utah Historic Preservation Office for the referenced date. Existing Division document records from the Utah Historic Preservation Office did include a letter dated September 24, 1981, indicating the Division of State History was in agreement. The State History memo states, ". . . it is unlikely that there are any cultural sites in the area or any that would be affected by the development of the Wellington Preparation Plant." The January 19, 1984, memo states, ". . . the negative report submitted would appear to comply with any OSM regulations for cultural resource management."

Findings:

The plan was found to meet the requirements of this section in the State Decision Document on August 22, 1984. The approval is based on the Division of State History documents dated September 24, 1981, and January 19, 1984.

VEGETATION RESOURCE INFORMATION

Regulatory Reference: R645-301-321

Analysis:

There are three major plant communities assumed to have been affected by the Wellington Preparation Plant. The plant communities were evaluated in 1983 and are shown on Map F9-178 and F9-179. Communities on the rolling hills are predominantly shadscale/galleta with some black sage/galleta. Drainage and valley areas probably supported a greasewood/seepweed community. There are small areas of nearly pure stands of Indian ricegrass and mat saltbush. Revegetation reference areas are in shadscale/galleta and greasewood/seepweed vegetation types.

There is a small portion of the riparian community near the Price River that was disturbed through coal operations. Based on a field visit, it appears that less than one acre of riparian vegetation was disturbed. Therefore, the plan does not contain vegetation information or a separate revegetation success standard for this area. However, it does contain a revegetation plan to enhance the wildlife habitat value.

Total living cover in the shadscale/galleta community was 35.00% of which 43.25%, 43.25%, and 13.65% was provided from shrubs, grasses and forbs, respectively. (The reason these figures do not add up to 100% is not known.) Shadscale, galleta, and desert plantain were the most common shrub, grass, and forb respectively. Shadscale made up about one-third of the total vegetative cover and galleta about one-fourth. Woody plant density was 3484 per acre. Total annual production was 239 pounds per acre. Range condition was rated by the Soil Conservation Service as fair.

Living cover in the greasewood/seepweed community was 76.67% and consisted entirely of shrubs. Woody plant density was 3964 per acre, and production was estimated to be 729 pounds per acre. Dominant plants were greasewood and Torrey seepweed. The Soil Conservation Service rated the range condition as poor.

Findings:

Information provided in the proposal meets all of the minimum regulatory requirements of this section.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: R645-301-322

Analysis:

Fish and wildlife information is found in Section 3.11. The Wellington Preparation Plant permit area is dominated by the shadscale and greasewood communities of the Upper Sonoran Life Zone. This life zone provides potential habitat for 246 vertebrate species of wildlife, including five fish, six amphibian, 15 reptile, 176 bird, and 44 mammal species. However, wildlife populations are generally considered low on the permit area. The plan includes a low-level study of wildlife within and adjacent to the permit area. This study was performed by Wildlife Resources.

The Price River is ranked as having limited value to the fishery management program. It supports one fish species of high interest, the channel catfish, and speckled dace a protected species. The riparian area is ranked as having critical value to local wildlife populations.

In 1983, surveys were made for threatened or endangered plant and animal species. No threatened or endangered species were observed. The permit area is within the ranges of several raptor species, but it does not contain suitable nesting habitat. Wintering bald eagle populations in the Price area have been increasing, but there are no known high-priority concentration areas or critical roost trees. Contrary to the information in the Wildlife Resources report, there are now at least three bald eagle aeries known for Utah.

Although the plan has little site-specific information, it is considered adequate to design the protection and enhancement plan required by R645-301-330.

Findings:

The wildlife information in the plan is adequate to design the protection and enhancement plan required by R645-301-330 and fulfills the requirements of R645-301-322.

LAND-USE RESOURCE INFORMATION

Regulatory Reference: R645-301-411

Analysis:

Current land uses are described as industrial, grazing, cropland and undeveloped lands on Exhibit E9-3343(1). The area is zoned by Carbon County as M&G-1, and the plan contains summaries of the activities that are permitted in this zone.

The Wellington Preparation Processing Plant has been in operation since 1958. Land uses prior to mining were described as industrial, grazing and undeveloped lands. The premining land use is determined to be those uses that were properly managed which the land previously supported prior to mining. The 1984 State Permit Decision Package determined the premining land uses to be "undeveloped lands" in the areas occupied by the coal cleaning plant, the railroad system and the refuse disposal area. The remaining areas were determined to be used for limited grazing. The permittee's description matches the premining land use description, identified in the State Decision Package.

Topsoil borrow areas "A" and "E" are not presently disturbed. Drawing 3343(1) indicates the land use for area "A" is "Pastureland/Grazing (Rotation Optional)." The text explains that cultivation and specific land use practices in this area change from year to year, and flexibility is based primarily on the use and availability of irrigation water. When the fields are irrigated, crops like grass and alfalfa hay and corn are grown, but the grass or alfalfa may sometimes be grazed.

Findings:

Information provided in the proposal meets all of the minimum regulatory requirements of this section.

OPERATION PLAN

PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

Regulatory Reference: R645-301-411.140

Analysis:

Because there are no known cultural resources in the permit area, no protection

measures are required. If any are found during the course of operations, a standard permit stipulation requires the permittee to notify the Division of State History.

Findings:

Information provided in the proposal meets all of the minimum regulatory requirements of this section.

AIR POLLUTION CONTROL PLAN

Regulatory Reference: R645-301-420

Analysis:

The Wellington Preparation Plant operates under an Approval Order from the Utah Division of Environmental Health, Bureau of Air Quality, issued December 29, 1989, and updated October 28, 1992. This approval order was issued to Castle Valley Resources, Inc., and the name on the approval order has now been changed to NEICO.

There is no specific mention of fines removal in the Approval Order, and it is not clear if this activity is permitted. If the permittee intends to remove fines from the slurry ponds, they should confirm that this is allowed under the Approval Order.

Findings:

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

INTERIM STABILIZATION

Regulatory Reference: R645-301-332

Analysis:

The plan says disturbances will be limited to those areas where permitted and necessary for efficient operations. Interim revegetation will be done when disturbed areas are not needed for further operations. These will be reclaimed and seeded at the first appropriate season following the methods in the reclamation plan.

The plan discusses interim measures as contemporaneous measures in this section, and they are not the same. Contemporaneous reclamation is final reclamation that is occurring contemporaneously with operations, but interim reclamation is done to stabilize areas that will be redisturbed later. However, the permittee has provided interim measures where possible. Specific areas and specific timing of interim reclamation measures were not discussed. Interim revegetation is developed to pertain to the outslopes of roads and other small areas to control erosion during operation periods. The permittee has generally completed interim measures on roads and outslope areas as required under this regulation.

Findings:

Information provided in the proposal meets all of the minimum regulatory requirements of this section.

FISH AND WILDLIFE PROTECTION

Regulatory Reference: R645-301-333

Analysis:

The fish and wildlife plan in Section 3.33 includes several measures recommended by Wildlife Resources. These include employee education about impact avoidance and mitigation, minimizing fugitive dust and sediment yield, maintaining instream flows in the Price River as far as possible, avoiding disturbance to riparian habitat, preventing wildlife use of ponds or other potentially hazardous areas, and protecting certain critical habitat areas. The permittee will promptly report the existence of any threatened or endangered of which it becomes aware.

The plan contains an April 8, 1992, letter from the Fish and Wildlife Service concerning power lines in the area. It says the lines do not conform to raptor protection specifications, but they did not recommend modifications because they are not being used by raptors.

Findings:

Information provided in the proposal meets all of the minimum regulatory requirements of this section.

RECLAMATION PLAN

REVEGETATION

Analysis:

Revegetation Methods

According to the revegetation timetable in Section 3.41, six weeks of topsoiling, fertilization, and applying additional amendments would be followed by seeding in the fall. Fall is the normal time to seed in this area. Late fall is normally recommended, but some operators have had success with earlier seedings where some species can establish before snow falls.

There are six general areas at the Wellington Preparation Plant, and different methods will be used in these areas. The areas are the pumphouse along the Price River to the base of the clear water pond, the surface facilities, the coarse slurry, the coal storage and processing area, the coarse refuse pile, and the slurry ponds. As outlined below, different methods will be used for these areas.

Chemical and organic matter soil treatments, fertilizer, topsoiling, and requirements to cover potential acid- and toxic-forming materials are not discussed in this section of the technical analysis. Surface preparation methods are discussed; those that may be used are ripping, gouging, and trenching.

The permittee commits to rip soils in the surface facilities area to a depth of one foot. Other areas will be ripped where needed.

Gouging has been the most effective treatment in the slurry pond/coarse slurry test plots. The slurry pond/coarse slurry test plot monitoring data cited in the plan, indicate perennial vegetation cover in gouges to be 18.38%, while perennial vegetative cover was 5.54% in non-gouged areas. Considering this and the difficulty the permittee has had establishing vegetation in any of the test plots, gouging is considered necessary to revegetate the area. The plan contains commitments to gouge every area.

Three seed mixes are presented in the plan. Mixture A is intended for areas believed to have had a shadscale/galleta community. It contains 16 species all but one of which are native to the general area. Mixture B includes 15 species, and these are all native to the area. Mixture B is intended for planting in areas believed to have supported a greasewood/seepweed community. Mixture C is for revegetation of the riparian community

and includes a plan to establish willows from seed. The places where the seed mixes will be used are shown on Map F9-178, 179.

In Section 3.42, the plan discusses wildlife habitat enhancement along the Price River. Tamarisk along some sections of the river will be cut and the stumps treated with an herbicide to prevent resprouting. Willow cuttings and about 50 cottonwoods would be planted along the river and the entire area would be seeded. The application says a source for cuttings is available a few miles away.

Seed will be applied by drill seeding in most areas except broadcast seed will be used in some inaccessible or steeper areas. In addition, the lighter, fluffy seeds that need to be on the surface or that cannot be drill seeded will be broadcast. Drill seeding sometimes decreases surface roughness, but surface roughness was successfully maintained in the test plots although they were drill seeded.

The permittee plans to mulch with two tons per acre of certified noxious weed free straw or alfalfa hay. Mulch will be crimped or otherwise tacked to the ground. Straw and hay have been shown to provide better erosion control and surface protection for seedling establishment than many other mulches. The rate specified in the plan has been shown in different studies to be optimal in several situations.

Irrigation was used in the slurry pond/coarse refuse test plots and was one of the successful treatments. The plan says there is some doubt as to when and how often the plots were irrigated, but there was a significant positive correlation for irrigated compared to non-irrigated slurry pond test plots. All commitments to irrigate have been removed from the plan. Irrigation may be needed to establish vegetation on this site, but it should be possible to revegetate it with the water harvesting technique proposed by the permittee.

Half of the coarse refuse pile plots were irrigated, but irrigation does not appear to have benefitted vegetation establishment in these plots. Very few perennial plants have established on the coarse refuse test plots.

The original surface facilities test plots were removed in 1990. Half of these plots were irrigated. The plots were sampled in 1990 before they were removed, but the data cannot be found. Lynn Kunzler, Division biologist, recalls that the irrigated surface facilities plots had much more perennial vegetation than the unirrigated plots. He believes the amount of perennial vegetation was as great as in the reference area. The new surface facility test plots, discussed below, have had limited success with no irrigation.

Judging from available information on effects of irrigation, it may be needed for establishing vegetation on the entire site. Precipitation is variable and undependable, and

irrigation appeared to have positive effects on most test plots. The Division can approve the plan without irrigation over the site. Success of vegetative establishment will determine whether irrigation may be required in the future.

Success Standards

Revegetation reference areas are shown on Map F9-178, 179. The plan contains a commitment to establish vegetation in accordance with the performance standards in R645-301-356.

Section 3.41 contains a final revegetation sampling schedule that will provide the data needed for determining whether the site meets revegetation requirements.

In 1995, a representative of the Natural Resources Conservation Service examined the reference areas. Productivity was estimated at 500 and 750 pounds per acre for the shadscale/grass and greasewood areas, respectively. They were rated as being in good and high fair condition and therefore acceptable as revegetation success standards.

Primary crops that have been grown in the topsoil borrow area are alfalfa and corn. Average production in 1991 and 1992 is estimated at 7384 pounds per acre for alfalfa and 6826 pounds per acre for corn. Production on the reclaimed area will be considered equal to this baseline information success standard when it is equal to or greater than 90 percent of the success standard with 90% statistical confidence. The production standard for alfalfa can be used whether the site is being used for hay or as a pasture. However, land being used for pasture or grazing must meet the revegetation success standards for both production and cover, and the plan does not contain any information about what cover standard would be used if the site was being used for grazing instead of crop production.

It appears that less than one acre of riparian habitat was disturbed; therefore, there is no requirement to have a separate reference area. The Division suggested and the permittee proposed using the greasewood reference area to judge revegetation success. Species composition in this reference area is not what would be expected in the riparian area, but total cover should be similar in both areas.

Since the approved postmining land use is undeveloped land with some grazing, the regulations do not require a woody plant density success standard. However, the permittee intends to plant willows and cottonwoods along some sections of the river to enhance wildlife habitat. The area will also be seeded with other species adapted to the area.

Section 3.41 includes methods for measuring cover, shrub density, frequency, production, and diversity. Cover will be measured by ocular methods using meter square

quadrants. Shrub density will be measured with the point quarter method. Production will be estimated by clipping, drying and weighing current annual growth. These methods would be used to compare revegetated areas with reclaimed areas as discussed in the plan, the regulations, and the "Vegetation Information Guidelines" Appendix A.

The plan also includes methods for judging diversity and seasonality. The first is a comparison using relative cover and grouping certain species together, generally by lifeform. The combined relative importance of a set number of species in a lifeform would not exceed 75% and a maximum dominance of 40% is set for each individual species. The method was published by Sandra Emrich in a symposium sponsored by the Office of Surface Mining. It should also allow for statistical comparisons between the reclaimed and reference areas. Although a direct comparison to the reference areas can and should be made, the permittee should not be required to have the same proportions of species in the reclaimed areas as in the reference areas. This makes it difficult to establish an actual standard aside from the maximums set in the plan.

In addition to the maximums included in the plan, the permittee should meet the following standards. First, the category of desirable plant species in the reclaimed area with the greatest dominance should not have greater dominance than the category in the reference area with the highest dominance with a 90% statistical confidence. Second, every category of desirable species represented in the reference area needs to be represented in the reclaimed area. These standards will provide for a representative amalgamation of the life forms present in the reference area.

The permittee intends to use three other methods to judge diversity and seasonality. These include the MacArthur and Wilson index and two methods of calculating the number of species in each plot. It does not appear the MacArthur and Wilson method allows for a statistical comparison. Also, the permittee has not proposed a method of comparing the reclaimed and reference areas. If the reclaimed area has a higher value, meaning the frequency of occurrence is less evenly distributed, in the reclaimed compared to the reference area, it will be difficult to judge whether the site meets the success standard (based on this one measurement). However, if the value for the index is similar or lower than for the appropriate reference area, the reclaimed area can be assumed to have a more evenly distributed frequency of occurrence.

The two other methods to be used to judge diversity and seasonality are straightforward. In the first, the average number of species in each quadrant is obtained by summing the frequency of all species in an area and dividing by 100. This method does not allow for a statistical comparison and does not differentiate between desirable and undesirable species although undesirable species could be entirely excluded from the comparisons. A possible standard would be to simply have a higher average number of species per quadrat in

the reclaimed area than in the reference area. If the permittee was not able to meet this standard but did meet other diversity standards in the plan, the Division would probably still be able to consider the vegetation to have met the diversity success standard.

The final method is a comparison of the total number of species encountered in the quadrats in each area. This method does allow for a statistical comparison. The permittee should be able to have at least 90% as many species in the reclaimed area as in the reference area with 90% confidence. Again, if the permittee is not able to meet this standard but does meet most of the other diversity and seasonality standards, the Division should probably still make a determination that the vegetation was diverse and comprised of species with the same seasonal characteristics as the reference area.

Numerous problems associated with soil and refuse will be encountered when reclaiming this site. Much of the refuse and some of the native soils have high salt and Boron levels which may inhibit water uptake or be toxic to plants. One of the success standards is that vegetation must be effective for the postmining land use. Selenium levels in some coal waste materials are higher than in Division guidelines. The permittee now plans to cover the waste materials with 4 feet of non-toxic materials which should aid in reducing availability of selenium to plant growth. If plant selenium levels are toxic to livestock, the vegetation would not be considered effective for the postmining land use. These issues are discussed in the review of the soils and coal waste.

The permittee has not provided a measure to determine whether vegetation is adequate to control erosion. In order to measure the success of reclamation efforts, a standard should be supplied which will enable a determination as to whether the soil surface has been stabilized. However, because the operator has not done this, the Division will determine appropriate standards and methods at the time of reclamation. The permittee will need to supply necessary information for the Division to make the determination that erosion is controlled.

Field Trials

The permittee had planned to use results from other test plots to develop a plan to rework the coarse refuse pile test plots in 1994. Instead, the plan now contains a commitment to cover the coarse refuse pile with four feet of soil from the borrow area. It says additional test plots on the coarse refuse pile are not necessary because of this commitment.

The Plant Coarse Refuse Pile has been nearly inactive since 1985. Division Order 96A requires the permittee to evaluate the Wellington Preparation Plant facilities and submit a reclamation schedule for those areas that are no longer useful. It was expected that field trials could be conducted on portions of the refuse pile that were permanently reclaimed.

The permittee responded that negotiations to sell the property are ongoing and that it would not be prudent for the current permittee to commit to a timetable. Field trials for the areas to be contemporaneously reclaimed will be coordinated with reclamation of the Plant Coarse Refuse Pile.

The surface facility plots were measured quantitatively in 1992 and were measured again in 1994. The 1994 data consists of plant density in each treatment plot (number of plants per acre). The data does not distinguish between desirable and undesirable species or give cover values. In 1992, these plots had about 2% cover from desirable species.

Although the most recent surface facilities plots have had limited success, this is probably due to climatic conditions rather than problems with the plan or its implementation. The previous plots apparently had better success, even in non-irrigated plots. Because favorable precipitation seasons are unpredictable and based on past successes and failures, it may be necessary for the permittee to seed more than once in order to establish vegetation on this site. However, it should be possible to establish vegetation meeting the requirements of R645-301-356 using the methods proposed in the plan.

The slurry pond/coarse slurry test plots have had some success and have provided useful information about certain reclamation practices. These are discussed under "Revegetation Methods."

The November 10, 1994, submittal compares data from the slurry pond/coarse slurry test plots to new data from the shadscale/galleta reference area. However, only grasses and shrubs were used in most of the comparisons. The reasoning is that most of the broadleaf forbs in the test plots were annual weeds. They would probably not have utility for the postmining land use. However, about 17% of the total vegetative cover in the reference area is from native broadleaf forbs not considered weeds.

In these comparisons, one slurry pond treatment combination ("N") had more cover than the reference area, and three others were within about five percentage points. A statistical comparison is not possible since the raw data was not submitted, but all four of these plots would probably be within 90% of the reference area standard (excluding broadleaf forbs) with 90% statistical confidence. The "N" treatment combination plots were not significantly different from the reference area standard even when broadleaf forbs were included in the reference area cover data (level of confidence not given).

To test whether the results from the "N" plots are anomalous, comparisons were made using all plots with the individual treatments in "N" to other plots. "N" plots were irrigated, had no coarse slurry over the fine slurry, had six inches of topsoil, and had no organic amendment. The organic amendment had no effect, but all other treatments used in

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"N" plots positively affected other plots. Therefore, it appears the results from the "N" plots are not anomalous.

Data from the slurry pond test plots and personal observations of the old surface facilities plots by a Division biologist suggest irrigation is a beneficial treatment for vegetation success. Therefore, it could be necessary to irrigate the area to meet revegetation standards.

Findings:

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

R645-301-341.250, The plan needs to contain a vegetative cover success standard for the topsoil borrow areas that might be used for grazing.

The plan includes four methods of measuring seasonality and diversity but does not show complete standards for these methods. This technical analysis includes a discussion of the standards that should be used for judging these elements of revegetation success, but the Division will need to use professional judgment to make a final determination whether the success standards have been met.

The permittee has not proposed a method for determining whether erosion has been controlled, so the Division will choose methods for measuring erosion control and standards for success at the time of reclamation. The permittee will provide the data needed.

RECOMMENDATIONS:

The plan and the proposal received July 7, 1997, do not meet minimum regulatory requirements.