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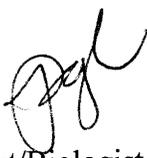
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February 25, 2002

TO: Internal File

THRU: Pamela Grubaugh-Littig, Permit Supervisor 

FROM: Paul B. Baker, Senior Reclamation Specialist/Biologist 

RE: Waste Rock/ BLM-ROW 65027, PacifiCorp, Cottonwood/Wilberg Mine, C/015/019-AM00A-1

**SUMMARY:**

On January 19, 2000, the Division received a proposal from PacifiCorp to revise the Cottonwood/Wilberg mining and reclamation plan. Revisions to this amendment proposal were received April 12, 2001, November 9, 2001, and November 29, 2001. Included in this amendment is a proposal to reduce the size of the permit area. PacifiCorp has relinquished some of its leases and proposes deleting these lease areas from the permit area. The legal descriptions in the right of entry section were compared with surface and coal ownership maps, and they are consistent.

The proposal includes changes to Appendix VII which contains soil and vegetation data. In 2000, Priscilla Burton wrote a memorandum expressing concern about this appendix and indicating it should not be approved. Some of her concerns have been addressed by correcting some of the transcription errors and including laboratory sheets. There are, however, additional deficiencies that should be corrected before the amendment receives final approval. Most of the soils portion of the technical analysis presented in this memorandum are copied and modified from Ms. Burton's memorandum.

Based on previous correspondence, it appears all parts of this amendment except the two discussed above (and in the analysis below) have been previously approved. This was done in a letter dated March 1, 2000. Because the amendment includes deleting part of the permit area, it will be necessary for the Division to issue a new permit.

**TECHNICAL MEMO**

**TECHNICAL ANALYSIS:**

**GENERAL CONTENTS**

**LEGAL DESCRIPTION AND STATUS OF UNSUITABILITY CLAIMS**

Regulatory Reference: 30 CFR 778.16; 30 CFR 779.12(a); 30 CFR 779.24(a)(b)(c); R645-300-121.120; R645-301-112.800; R645-300-141; R645-301-115.

**Analysis:**

The applicant has proposed to revise the permit area to exclude certain areas for which it no longer has right of entry. The mineral and surface ownership maps and the legal descriptions in the text of the right of entry section have been changed. The maps were checked against the legal descriptions in the text, and they correspond.

The applicant only has right of entry for a portion of the SW1/4 NE1/4 of Section 27, Township 17 South, Range 7 East, and the application includes a full metes and bounds description for this area. For simplicity, this entire 40-acre area was included in the permit area, and this is acceptable so long as no mining or reclamation activities occur in areas where the applicant does not have right of entry.

**Findings:**

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

**OPERATION PLAN**

**SPOIL AND WASTE MATERIALS**

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645 -100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

**Analysis:**

The following changes have been noted with this revision:

1. Table I of the revised App. VII describes the "standard classification" of the salinity of soils.

2. Attachment F contains, "Soil Analysis Raw Data Comparative [sic] Charts: 1986/1994." Pages 5-9 of Appendix VII also discuss the conclusions of this report. The report compares soil analyses in 1986 and 1994. Conclusions are drawn about salt movement in the soil.

Attachment F (of the revised App. VII) presents 'raw' data from Cells 2, 4, and 5 taken from 1, 2, and 3 foot intervals in 1986. The following errors were noted with this Attachment:

1. This chart includes not only data analyzed in 1986 by NPI Soil Testing Laboratory, but also data analyzed in 1989 by ACZ Laboratories.
2. There are no laboratory data sheets in the MRP or in the Annual Reports for the 1994 data so it was impossible to check the veracity of the transcription into Attachment F.
3. Incorrectly transcribed data was used to create some 3-dimensional graphs. Most of the errors were small and cannot be seen on the graphs, but one error (2H) was large and shows on the graph. This is not included as a deficiency because it is almost impossible to see the error on the graph and because the correct data is in the application
4. The 3-D graph for site 5C did not reflect the SAR values that were recorded in 1994.

The original laboratory data has now been included in the revision of Appendix VII.

Although the text on page 5 of revised App VII indicates that the waste was covered with 3.4 feet of soil cover, the soil sampling information indicates otherwise. For example:

1. Cell 2 was seeded in 1984. Samples taken from Cell 2 in 1989 (ACZ Laboratories, Inc.) indicate that coal was encountered at one to two feet which suggests that there was cover over the waste to a depth of less than two feet. Therefore, the 1986 soil samples would be of one to two feet of soil cover over the waste.
2. Cell 4 was seeded in 1986. 1989 analyses from ACZ again indicate that coal was encountered at one to two feet in cell 4.

The statement that 3.4 feet of soil was placed over the site is not supported by the laboratory data and should be field verified and changed if necessary. If field verification confirms that 3.4 feet of soil is present, the text should mention that this verification was done and that either the lab sheets are in error or that some parts of the site may have less soil cover.

TECHNICAL MEMO

Salinity and sodicity are of concern at the waste rock site. The data from Table II and Table III of App VII (dated 8/22/89) describes waste rock material in Cell 2 that is sandy loam in texture, high in carbon, and has high EC and extremely high SAR values. (Some of the data presented are combined means from 1986 and 1989 sampling.) In 1986/9, Cells 5 and 6 also had high SAR values, although not to the extreme of Cell 2. Further data from 1989 indicate that the material is low in carbonates and high in chloride salts. Elevated boron levels were recorded at locations 4-A-2 and 5-C-4.

Over time, leaching of the salts has occurred from the soils, as discussed in the narrative on pages five through nine of Appendix VII. Levels of all ions ( $\text{Ca}^{++}$ ,  $\text{Mg}^{++}$ ,  $\text{Na}^+$ ,  $\text{Cl}^-$ ) decreased in 1994 from 1986/9 values. Where there were extreme EC and SAR values, there are now values which are manageable for the vegetation which was seeded and land use which will occur.

In 1994, soil tests revealed elevated sodium below one foot at sites 2-G and 2-H in Cell 2. The 1994 Vegetation Monitoring Annual Report also mentions these sites as problem areas where large saltbushes are dying back and where halogeton is dominant.

The revised App. VII revealed two major trouble spots in Cell 5 as well. Those are sites 5-C and 5-D which are saline/sodic throughout all depths. It was noted in Attachment C, "Comparison of Vegetation Data of Selective Reclaimed Cells at the Cottonwood Old Waste Rock Site, 1997," that there were "patchy" areas (approximately 10 - 15% of the cell [5] area) where only weedy species appeared to be growing." The consultant (Patrick Collins) surmised that these areas may have soil problems. These areas are not shown on Figure 2 of App. VII, but they may correspond with sites 5-C and 5-D noted above to be saline/sodic at all depths.

There has been nine years of growth in Cell 2, and this area has about 50% vegetative cover. According to Attachment C, most of that cover is crested wheatgrass (*Agropyron cristatum*). One-third of the cover is fourwing saltbush (*Atriplex canescens*). The consultant (Patrick Collins) mentions that "the differences between the two areas [Cell 2 and Cell 2 problem area] were much less than the previous years." The location of the problem area was not noted on Figure 2 of App. VII, so it is difficult to know how the soils data of Attachment F corresponds to the vegetation data of Attachment C.

Also measured were the establishment of plants in Cells 4 and 5. These cells have only 3 years of growth for comparison. At this stage of reclamation, vegetative cover is 47% for Cell 4 and 57% for Cell 5. In both cases, the bulk of the cover is from grasses, particularly western wheatgrass (*Elymus smithii*) and crested wheatgrass (*Agropyron cristatum*) for Cell 4 and needle-and-thread grass (*Stipa comata*) and crested wheatgrass for Cell 5. Shrub growth is improving.

**Findings:**

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

**R645-301-553.252**, Attachment F needs to be labeled to show it is a comparison of 1986/9 combined data and 1994 data.

**R645-301-553.252**, The locations of sampling areas discussed as “problem areas” of Cell 2 and “patchy areas” of Cell 5 in Attachment C; ( 6 ) should be shown in the application, probably in Figure 2 of Appendix VII.

**R645-301-553.252**, The statement that 3.4 feet of soil was placed over the site is not supported by the laboratory data and should be field verified and changed if necessary. If field verification confirms that 3.4 feet of soil is present, the text should mention that this verification was done and that either the lab sheets are in error or that some parts of the site may have less soil cover.

**RECOMMENDATIONS:**

The amendment should not be approved until the deficiencies discussed in this memorandum have been adequately resolved.