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State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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OK

September 6, 2001

TO: Internal File

THRU: Wayne Western, Reclamation Engineer and Team Lead *WWTW*

FROM: Priscilla Burton, Soils Reclamation Specialist *PB*

RE: Revision to Reclamation Plan, Energy West Mining Company, Deer Creek Mine, C/015/018-AM99C-(4)

SUMMARY:

The Division requested information from Energy West in a letter dated July 16, 1998 as part of a mid-term review of the Deer Creek Mine. The chronology of the mid-term review is itemized below along with the reviewer of each submittal.

| Energy West Submittals | Division Review Date | Soils Reviewer |
|--|--|----------------|
| 8/7/98 initial mid term submittal | September 14, 1998 request for highwall elimination plan | |
| May 26, 1999 revised reclamation plan including highwall elimination | July 6, 1999 | Davidson |
| December 6, 1999 | March 13, 2000 | Davidson |
| September 21, 2000 | November 3, 2000 | Baker |
| March 22, 2001 | May 18, 2001 | Baker |
| July 20, 2001 | This document | Burton |

The information submitted supercedes that in the approved MRP, Volume 2, Part 4. With this submittal, the Permittee has discontinued the concept of utilizing the outslopes of the pads as substitute topsoil and instead proposes to demonstrate (through sampling and analysis) that substitute topsoil is available in the depths of the fill along the Deer Creek drainage.

Also in this submittal the Permittee proposes to further characterize the refuse to provide the Division with evidence that the refuse is non-toxic forming and therefore requires less than four feet of cover. Samples will be collected in the years 2001 and 2002 by a qualified individual and analyzed for parameters outlined in the Division's *Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mines*. The submittal indicates that all toxic and acid forming material will be covered with four feet of material, but does not specify how this will be accomplished.

A large area of terraced hillside will remain unreclaimed as a visual scar on the landscape. These terraces are pre-law disturbances and should be brought to the attention of the Abandoned Mine Reclamation program Administrator.

TECHNICAL ANALYSIS:

GENERAL CONTENTS

PERMIT APPLICATION FORMAT AND CONTENTS

Regulatory Reference: 30 CFR 777.11; R645-301-120.

Analysis:

Plate DS-1810-D has two locations labeled DC0699 one of these locations should be DC0899.

The areas to be sampled will be at accessible sites between 3+00 and 31+00 (as stated on page 2-2) or between 9+00 - 15+00 and 24+00 - 30+00 shown on map DS-1782-D (as stated in Appendix R645-301-200-A). As stated on page 2-2 and in Appendix A, testing will be done according to the Division's soils guidelines, Appendix A. (There is no Appendix A of the Guidelines.)

Findings:

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

R645-301-121.200, Locate sample site DC0899 on Plate DS-1810-D. Correlate information given on page 2-2 with that provided in Appendix R645-301-200-A concerning the area to be sampled for substitute topsoil potential. Please replace reference to Appendix A of the Division's soil guidelines on page 2-2 with the Table 6, Recommended Laboratory Methods, of the Division's 1988 *Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mines*

REPORTING OF TECHNICAL DATA

Regulatory Reference: 30 CFR 777.13; R645-301-130.

Analysis:

In Appendix R645-301-200-A, Site #1 and Site #6 Lab Analysis, the information provided has been condensed by the Permittee into a spreadsheet. The information does not include the name of the company conducting the laboratory analysis or the methods of analysis. Also, texture and TOC of the material should have been reported, but was not; and, incomplete acid base accounting information was reported for these samples.

Findings:

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

R645-301-130, Submit original laboratory reports for Site #1 and Site #6 Lab Analysis.

OPERATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

Analysis:

Topsoil Substitutes and Supplements

Exploration/Sampling Program - Substitute Topsoil

The Deer Creek Mine was developed prior to enactment of the Surface Mining Control and Reclamation Act (SMRCA), and topsoil was not salvaged or stockpiled during construction and mine development activities. The applicant intends to use construction fills within the disturbance area as substitute topsoil. Much of this fill material came from the terraced area on the south side of Deer Creek Canyon.

In 1999, eighteen samples were taken from the terraces from which much of the fill originated, and these were analyzed for the parameters in the Division's soils guidelines. Sample locations are shown on DS-1810-D and results are in Appendix R645-301-200-C. (Plate DS-1810-D has two locations labeled DC0699 one of these locations should be DC0899. Page 2-1 erroneously refers to Appendix R645-301-200-B rather than C for this information.) There is no information about the depth of sampling or whether these samples were composited. Clay

percentages are high (averaging 32% in the upper two terraces) and textures are listed mostly as clay loam. The pH is just above neutral. The Electrical Conductivity is less than 0.7 mmhos/cm. Total Organic Carbon content was on the average 5.3%, whereas total Nitrate Nitrogen averaged 0.39 ppm.

Most of the samples from 1980 and 1983 show few problems with EC or SAR values; however, two samples from the parking lot fill slope had EC values of 9.0 (assumed to be mmhos cm^{-1}). This could be a result of using salt as discussed above, and the problem may have grown progressively worse to where some of these soils are now unusable.

The Permittee commits in this application to conduct a soils sampling program during in June through October of 2001 and 2002. The areas to be sampled will be at accessible sites between 3+00 and 31+00 (as stated on page 2-2) or between 9+00 - 15+00 and 24+00 - 30+00 shown on map DS-1782-D (as stated in Appendix R645-301-200-A). As stated on page 2-2 and in Appendix A, testing will be done according to the Division's soils guidelines, Appendix A. (There is no Appendix A of the Guidelines.) The timetable commitment is acceptable, and it is important that the Permittee and the Division ensure soil samples are actually taken and analyzed and that the mining and reclamation plan is amended accordingly.

Fill materials which have been seeded for 15 to 20 years may also be a source of cover material to be used a cover over the site.

Exploration/Sampling Program – Refuse Piles

Appendix R645-301-200-A contains analyses of two core samples from the refuse piles, one from Deer Creek Canyon (site #1) and one from Elk Canyon (site #6). Sample locations are shown on Drawing DS-1810-D. Extreme sodicity was found to a depth of 7.5 feet at site #1; SAR values were 30.7 and 42. This could be because the sample site was near two storage docks where salt may have been used. The refuse in Elk Canyon, site 6, is also sodic, but not to the extreme noted at site #1. However an SAR value of 11.5 is combined with an extreme pH of 9.0 in the top 1.5 feet. Sites #1 and #6 were sampled to depths of 25 feet. At all depths at both sites, selenium content exceeded the recommended limits in the Division guidelines. The texture and TOC of the material should have been reported, but was not. Incomplete acid base accounting information was reported for these samples. The information required by R645-301-130 was not submitted with the technical data in Appendix R645-301-200-A as stated on page 2-2 of the submittal. Additional sampling of these refuse piles will be conducted in 2001/2002.

Within Chapter 3 of the current mining and reclamation plan, page 3-65, Table 7, Deer Creek Mine - Waste Rock Analysis, several problems are identified associated with materials taken from roof and floor materials. Data is incomplete since no determinations were made for selenium or for acid base potential. One of the samples had a paste pH value of 5.87 which indicates there could be acid forming potential. One Blind Canyon floor sample apparently had a very high SAR value which indicates that although some areas may meet the Division's criteria,

there are probably isolated problem areas.

The Division lacks confidence in the data in Table 7 because some of the SAR values do not correlate with the reported calcium, magnesium, and sodium values. Either some of the SAR values were calculated incorrectly or the sodium, calcium, and magnesium values were not reported correctly.

Tables I and II in Chapter 4 also show some chemical analyses of coal waste and one sample of slag. The slag sample had a very high pH (10.9), but otherwise, no problems were found in the refuse or slag samples. However, the applicant did not test these samples for several parameters listed in the Division's *Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mines*. The Division recognizes that the 1980 thru 1983 operational sampling took place prior to implementation of the 1988 guidelines for topsoil and overburden. However, reclamation standards for soil and overburden are now rated using the 1988 guidelines. Therefore, since sampling did not follow the current 1988 Division guidelines for topsoil and overburden, information in Tables I and II is incomplete and does not show that the fill or refuse materials in Deer Creek and Elk canyons are suitable for achieving the revegetation standards.

The Division cannot make a determination of waste acceptability. Errors exist within some of the data in the current plan, and some analyses are incomplete and do not follow the Division's soils guidelines. Furthermore, unacceptable criteria are identified for Blind Canyon floor samples for SAR and pH, and poor criteria are met on Blind Canyon split samples for SAR and on Hiawatha floor samples for pH. Therefore, since data errors exist, data is incomplete, and roof and floor analyses identify toxicity, the Division determines that the refuse is toxic forming and unacceptable for plant growth and must be covered with a minimum of four feet of acceptable material.

To dispute the characterization of the refuse as toxic forming, the Permittee commits in the application to further sampling of the refuse (page 2-4). Sampling will be done in 2001 and/or 2002 on the same schedule as the substitute topsoil sampling. Sample points will be placed randomly in the refuse areas, and samples will be taken at three-foot depth intervals to a point four feet below the grade of the proposed final surface configuration. This commitment is acceptable.

All soil and refuse sampling will be conducted by a qualified individual (page 2-4). Said persons credentials will be submitted to the Division. The Division soil scientist would appreciate being present when the samples are taken.

Findings:

Information provided in the proposal is adequate to meet the requirements of Operation Plan, Topsoil and Subsoil section of the Regulations.

RECLAMATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

Redistribution

Table 3-1 shows the timing of various steps in reclamation, and Table 3-2 is a schedule of monitoring activities. Except for soil sampling, the reclamation timetable does not show months in which the activities would occur, but a note below the table discusses the timing of seeding and planting more specifically. Soil salvage and replacement activities would be done during backfilling and grading operations.

Reclamation will involve three disturbed areas: Deer Creek Canyon, Deer Canyon, and Elk Canyon. According to the backfilling and grading plan in Section R645-301-553 of the application, reclamation will begin at the uppermost parts of the disturbed areas and will proceed down the canyons. Various stages of the process will be occurring simultaneously. Substitute topsoil will be excavated from the existing undisturbed drainage corridor and stored in the area of the dismantled truck loadout and storage area (Area #2, see DS-1796-D in Appendix R645-301-500A).

Maps DS1783D Sheets 1 and 2 illustrate that the substitute topsoil will be excavated along the length of the Deer Creek drainage between stations 1+00 and 32+00. The locations of these cross sections are shown on map DS-1782-D. It is estimated 58,891.08 cubic yards of material is available which gives an average cover depth of 27 inches over 16 acres as illustrated on Map DS-1816-D.

The plan no longer includes salvage of the upper 18 – 24 inch layer on the fill slopes at the equipment yard and run of mine conveyor which were seeded twenty years ago and have been identified in the approved MRP as substitute topsoil due to their improved rooting environment suitable for seed germination and microorganism colonization (approved MRP, Vol 2, Part 4 Reclamation Plan page 4-29).

The estimates of the amount of soil available must be considered strictly estimates at this point and cannot be finalized until results are received from the sampling program. Having 27 inches of substitute topsoil over nontoxic spoil and refuse would be acceptable, but the Division is unsure how widespread the problems are that have been identified in the spoil and refuse. Therefore, the Division requests that Energy West provide further information in this plan concerning the location of the required four feet of cover.

Soil Nutrients and Amendments

The biology chapter of the application says fertilizer will be applied at the rate of 40 pounds per acre of ammonium nitrate and 35 pounds per acre of triple superphosphate. The Division encourages operators to use minimal amounts of fertilizer, and these quantities are relatively low.

In addition to the fertilizer, the applicant commits to apply one ton per acre of certified noxious weed free hay, and the hay and fertilizer will be incorporated into the soil in the gouging process. This should help to increase the amount of organic matter and the fertility and structure of the substitute topsoil.

Refuse Pile Reclamation

Refuse that is cut during grading will be used as fill along cut banks and highwalls. Any acid-forming or toxic materials will be covered with four feet of non-acid and/or nontoxic material.

To date, information on the refuse shows that it is unsuitable as a plant growth medium. However, sampling of vegetation established on portions of the refuse pile for interim erosion control indicates the refuse can, at least in some areas, support vegetation. In 1998, vegetation cover on the refuse pile was measured by the applicant's consultant as 40.5%, and in 1999, vegetation cover on the pinyon-juniper reference area was roughly estimated as about 40%. While this seems to indicate the refuse can, by itself, support adequate vegetation, there is no vegetation established on the area of the refuse pile where the high salt concentrations were found near the surface.

Findings:

Information provided in the proposal is not adequate to meet the requirements of Operation Plan, Topsoil and Subsoil section of the Regulations. Prior to final approval, the applicant must provide the following in accordance with:

R645-301-553.252, Indicate in the plan the source of the four feet of cover presently required over the refuse.

STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

Analysis:

Once soil has been distributed, the soiled surface will be roughened by deep gouging (pocking) using a trackhoe to create depressions approximately 3 feet diameter x 1.5 feet deep. The application says these depressions will be developed throughout the reclaimed area and will influence moisture retention and greatly reduce sediment loss. Deep gouging creates depressions across the surface which increases water harvesting and helps reduce surface erosion. In addition, rock litter consisting of various sized rocks and boulders will be randomly placed on the slopes and/or nested into the soil to help control slope slippage.

After seeding, the application says certified noxious weed free straw mulch will be applied at a rate of 2000 pounds per acre followed by application of 500 lbs/ac of tackifier on slopes greater than 20% to anchor the straw mulch and stabilize the soil. This mulching technique has worked very well at similar nearby mine sites.

Rills and gullies which develop to a depth of nine inches or greater in areas that have been re-graded and topsoiled and which either; (1) disrupt the approved post-mining land use or the reestablishment of the vegetative cover, or (2) cause or contribute to the violation of water quality standards for receiving streams will be filled, regraded, or otherwise stabilized. The topsoil will be replaced and the areas will be reseeded.

Findings:

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

RECCOMENDATIONS:

There are some errors of fact and omission which need to be resolved before the submittal can be incorporated into the Mining and Reclamation Plan.

The inspector for this site must be briefed on the multiple commitments made for refuse, fill and substitute topsoil sampling information to be collected in 2001 and 2002.

The refuse is not acceptable as a plant growth medium and must be covered with four feet of material. There is no surplus of cover material. Sources of suitable plant growth material include the vegetated out slopes of the mine yard.

The reclamation plan does not include the four terraces created pre-law. This area should be brought to the attention of the Abandoned Mine Reclamation personnel. Perhaps they can coordinate their efforts with those of Energy West.