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

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September 28, 2001

Chuck Semborski, Environmental Supervisor
Energy West Mining Company
P.O. Box 310
Huntington, Utah 84528

Re: Revision to Reclamation Plan, PacifiCorp, C/015/018-AM99C-4, Outgoing File

Dear Mr. Semborski:

The above-referenced amendment has been reviewed. There are deficiencies that must be adequately addressed prior to approval. A copy of our Technical Analysis is enclosed for your information. In order for us to continue to process your application, please respond to these deficiencies by October 30, 2001.

If you have any questions, please call me at (801) 538-5325 or Wayne Western at (801) 538-5263.

Sincerely,

Daron R. Haddock
Permit Supervisor

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Enclosure:
cc: Price Field Office
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State of Utah

Utah Oil Gas and Mining

Coal Regulatory Program

Deer Creek Mine
Revision to Reclamation Plan
C/015/018-AM99C-4
Technical Analysis
September 27, 2001

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TECHNICAL ANALYSIS

INTRODUCTION

On June 7, 1999, the Division received a proposal from PacifiCorp to revise the reclamation plan for the Deer Creek Mine. This proposal was somewhat conceptual, but the Division reviewed it and sent the review July 7, 1999. A revised proposal was received December 6, 1999, and the Division's analysis was sent March 13, 2000. Most of the proposal reviewed in the current technical analysis was received September 21, 2000. Certain modifications to the hydrology section of the plan were received August 31, 2000, but are reviewed in this analysis. The Permittee submitted a revised reclamation plan on March 22, 2001. The Division found that all highwall issues were satisfied but the soils section still had deficiencies.

INTRODUCTION

SUMMARY OF DEFICIENCIES

The Technical Analysis of the proposed permit changes cannot be completed at this time. Additional information is requested of the permittee to address deficiencies in the proposal. A summary of deficiencies is provided below. Additional comments and concerns may also be found within the analysis and findings made in this Draft Technical Analysis. Upon finalization of this review, any deficiencies will be evaluated for compliance with the regulatory requirements. Such deficiencies may be conditioned to the requirements of the permit issued by the Division, result in denial of the proposed permit changes, or may result in other executive or enforcement action as deemed necessary by the Division at that time to achieve compliance with the Utah Coal Regulatory Program.

Accordingly, the permittee must address those deficiencies as found within this Draft Technical Analysis and provide the following, prior to approval, in accordance with the requirements of:

Regulations

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* 7

R645-301-121.200, The Permittee must give the Division a submittal that contains all the relevant information in the four previous submittals. The Division needs the information submitted in that form so that the staff can review the reclamation plan without having to refer to four previous submittals..... 7

R645-301-130, Submit original laboratory reports for Site #1 and Site #6 Lab Analysis. 8

R645-301-553.252, Indicate in the plan the source of the four feet of cover presently required over the refuse..... 24

R645-301-830.130, The Permittee did not include a detailed reclamation cost estimate in the amendment. The Permittee informed the Division that the reclamation cost estimate would not be submitted until the reclamation plan was approved. The Division agreed to that procedure. Prior to final approval the Permittee must submit a detailed reclamation cost estimate. 35

SUMMARY OF DEFICIENCIES

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.)

The Permittee has given the Division four submittals for the reclamation plan. The Permittee did not update each submittal. Therefore, the Division must reference each of the four submittals when reviewing the reclamation plan. Reviewing four submittals is confusing to the Division's staff. The Permittee must submit a reclamation plan that contains all appropriate information that is contained in the four submittals. In addition, the Division needs a stand along reclamation plan that can be directly inserted into the MRP.

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*

R645-301-121.200, The Permittee must give the Division a submittal that contains all the relevant information in the four previous submittals. The Division needs the information submitted in that form so that the staff can review the reclamation plan without having to refer to four previous submittals.

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

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-270, -301-271, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Minimum Regulatory Requirements:

Note :The following requirements have been suspended insofar as they authorize any variance from approximate original contour for surface coal mining operations in any area which is not a steep slope area.

Criteria for permits incorporating variances from approximate original contour restoration requirements.

The Division may issue a permit for nonmountaintop removal mining which includes a variance from the backfilling and grading requirements to restore the disturbed areas to their approximate original contour. The permit may contain such a variance only if the Division finds, in writing, that the applicant has demonstrated, on the basis of a complete application, that the following requirements are met:

1.) After reclamation, the lands to be affected by the variance within the permit area will be suitable for an industrial, commercial, residential, or public postmining land use (including recreational facilities).
2.) The criteria for the proposed post mining land use will be met.
3.) The watershed of lands within the proposed permit and adjacent areas will be improved by the operations when compared with the condition of the watershed before mining or with its condition if the approximate original contour were to be restored. The watershed will be deemed improved only if: the amount of total suspended solids or other pollutants discharged to ground or surface water from the permit area will be reduced, so as to improve the public or private uses or the ecology of such water, or flood hazards within the watershed containing the permit area will be reduced by reduction of the peak flow discharge from precipitation events or thaws; the total volume of flow from the proposed permit area, during every season of the year, will not vary in a way that adversely affects the ecology of any surface water or any existing or planned use of surface or ground water; and, the appropriate State environmental agency approves the plan.
4.) The owner of the surface of the lands within the permit area has knowingly requested, in writing, as part of the application, that a variance be granted. The request shall be made separately from any surface owner consent given for right-of-entry and shall show an understanding that the variance could not be granted without the surface owner's request.

If a variance is granted, the requirements of the post mining land use criteria shall be included as a specific condition of the permit, and, the permit shall be specifically marked as containing a variance from approximate original contour.

A permit incorporating a variance shall be reviewed by the Division at least every 30 months following the issuance of the permit to evaluate the progress and development of the surface coal mining and reclamation operations to establish that the operator is proceeding in accordance with the terms of the variance. If the permittee demonstrates to the Division that the operations have been, and continue to be, conducted in compliance with the terms and conditions of the permit, the review specified need not be held. The terms and conditions of a permit incorporating a variance may be modified at any time by the Division, if it determines that more stringent measures are necessary to ensure that the operations involved are conducted in compliance with the requirements of the regulatory program. The Division may grant variances only if it has promulgated specific rules to govern the granting of variances in accordance with the provisions of this section and any necessary, more stringent requirements.

Analysis:

The requirements for restoring a site to the approximate original contour (AOC) are couched in the backfilling and grading regulations. The only regulation that specially mentions AOC requirements is R645-301-553.110 that states the following:

> Achieve the approximate original contour (AOC), except as provided in R645-301-553.500 through R645-301-553.540 (previously mined areas (PMA's), continuously mined areas (CMA's) and areas subject to the AOC provisions), R645-301-553.600

through R645-301-553.612 (PMA's and CMA's), R645-302-270 (non-mountaintop removal on steep slopes), R645-302-220 (mountaintop removal mining), R645-301-553.700 (thin overburden) and R645-301-553.800 (thick overburden);

Since some of the highwalls at the Deer Creek site are CMA's the permittee can leave highwall remnants when allowed under R645-301-553.600 through R645-301-553.612. Thus the permittee can leave some highwalls remnants and still meet the AOC requirements at the Deer Creek Mine site.

The Division's technical memo Tech-002 gives additional AOC guidelines. Those guidelines were also used to evaluate the Deer Creek Mine for AOC compliance.

Except as specifically exempted, all disturbed areas shall be returned to the approximate original contour. The final surface configuration shall closely resemble the general surface configuration of the land prior to mining. To evaluate compliance with this requirement, the term "surface configuration" must be clarified. Surface configuration refers to the premining and postmining topography of the mine site and surrounding area.

The term AOC does not mean that the land is restored to the original contours. Elevation of the premining and postmining site plays a minor role if any in evaluating AOC.

The main question that the Division answers when evaluating AOC is "Does the postmining topography, excluding elevation, closely resemble the premining configuration?" The Division evaluates premining and postmining topography on slope length and angle, and whether restoring the site to the original contours would violate other rules.

In some cases the permittee cannot restore the site to the premining contours without violating other regulations, such as slope stability and erosion. Many of the natural slopes in the area are at the angle-of-repose. When a slope is at its angle-of-repose, the safety factor is 1.0 or slightly greater. The minimum safety factor for reclaimed slopes is 1.3. If all slopes were returned to the premining conditions, the safety factor requirement could not be met.

When the natural slope has a safety factor less than 1.3, the permittee usually opts to reduce the slope angle by either extending the toe or decreasing the height. Extending the slope's toe may block the drainage which violates other regulations. If the permittee decreases the slope height then a cut slope will be left.

The Deer Creek mine consists of four separate surface facilities. This TA will address how each of those facilities will be reclaimed.

Deer Creek

The final contour map for the main Deer Creek site is Drawing DS1782D, Creek Mine Disturbed Area Final Reclamation Contour Map, and the reclamation cross sections are on Drawing DS1783D and DS1784D. The reclamation contours maps show the locations of the highwall remnants, the location of the cross sections, the refuse piles, drainage systems and the cut and fills quantities. The cross section maps show the locations of the Blind Canyon coal seam and the concrete and asphalt disposal areas.

The cross sections are not always perpendicular to the contours. Thus the cross sections show slopes that are less steep than the maximum slope angle. This is important to remember when evaluating highwall reclamation.

The main Deer Creek facilities area is considered a pre law site, because it was constructed before May 3, 1978. Because the site is pre law, the permittee only has to eliminate highwalls to the extent practical. On page 5-12 the permittee explains why highwall remnants will remain as follows:

- Highwall remnants are proposed at the Deer Creek Mine since sufficient fill material does not exist to completely eliminate these areas. The areas are outlined on maps DS-1782-D, 1 of 1 and DS-1783-D 1 of 2, 2 of 2. The Deer Creek Mine is considered a continuously mine area (CMA). Development of the portals began before the passage of SMCRA and therefore, no spoil material was ever salvaged. Since it is impossible to completely eliminate the highwall areas, the idea is to blend these areas into the natural surroundings of the canyon to become compatible with the approved post mining land use.

- The portion of the highwalls remaining consist of near vertical fluvial channel sand escarpments associated with the Blackhawk formation (refer to Volume 8, Geologic Section). The fill material below these areas is combination of crushed concrete and underground development wastes. Stability of these areas are presented below. A conceptual highwall elimination plan for the Deer Creek is presented in Appendix R645-301-500-D. Cut and fill estimates agree with the highwall elimination plan.

The main reasons why the Division allows highwall remnants to remain are (1) slope stability problems and (2) lack of fill material. Many highwalls in Utah are located in steep canyon. If the permittees were to completely backfill the highwalls in some steep canyon the results would be either the slope is to steep to achieve the 1.3 safety factor or the backfill would interfer with the drainage plans. The Division reviewed the cross section and found that the permittee could eliminate the highwall remnants by placing more fill. The addition fill could be

placed without decreasing the safety factor below 1.3 or interfering with the drainage plan. See Appendix R645-301-500-E for the slope stability study. Therefore, slope stability concerns are not the reason that the Division would allow highwall remnants to remain.

The Division reviewed the cut and fill calculations. The permittee does not have enough fill material on the site to totally eliminate the highwalls and have the reclaimed topographies blend into the surrounding topography. The permittee could place more fill against the highwall to reduce or eliminate the highwall remnants. If the permittee did eliminate the highwalls then they would not have enough fill to grade the rest the site so that it blended into the surrounding topography. If the permittee placed most of the fill along the highwalls then the valley floor would have to be flat. The surrounding topography is V-shaped valleys not valleys with steep slopes and a flat bottom.

The valley walls consist mostly on soil overlying bedrock. If the permittee were to get more fill on site their only option would be to use bedrock.

The highwalls are usually at the base of natural cliffs. If the permittee placed more fill along the highwalls they would not eliminate the safety hazards associated with cliffs or restore the area to the natural topography.

The surrounding area contains natural cliffs. The highwall remnants at the cliff bases will blend into the surrounding topography.

The Division has determined the permittee has met the minimum requirements of R645-301-553.600. The permittee cannot reclaim all the highwalls because they do not have access to enough reasonably available fill material.

Rilda Canyon

The reclamation plans for Rilda Canyon are shown on drawing CE-10884-EM. Rilda Canyon Final Reclamation of Surface Facilities and Access Road and the cross sections on drawing CE-10891-EM (sheet 1 and sheet 2) Rilda Canyon Access Road/Facilities Cross Sections. The cross sections show that the area will be restored to a configuration similar to the original topography. The main difference is some slopes will be less steep because the permittee needs to place excess material along the slopes.

The permittee shows the location of the highwalls both the topographic map and cross sections. The cross sections show that the highwalls (portal face up) boundaries. During reclamation the highwalls will be completely covered.

The slope angles are no steeper than 2H:1V, which the Division considers stable under must circumstances. The permittee did not address slope stability at the Rilda Canyon site.

9th East Grimes Wash Portals

The Grimes Wash portal area has been reclaimed. The as built drawings were approved on February 14, 2001 and are located in Appendix 14 of Volume 3 of the MRP. The plans show that the highwalls have been reclaimed. Most of the highwalls were constructed in vertical out crops. Therefore, the extent of the highwall was limited to the approximate portal dimensions.

9th East North Meetinghouse Portals

The 9th East North Meetinghouse Portals consist of two breakouts that are 20 ft. long, 20 ft. wide and 8 ft. tall. The reclamation plan for the portals is as follows:

- Backfill the portals for approximately 25 ft. from the opening using rock materials from inside the mine.
- Construct a solid concrete block seal.
- Remove all noncoal waste from the surface area. No coal waste is located at the site.
- Backfill the portals openings at a 2 H to 1 V slope. Approximately 120 CY of material is needed per portal.
- Soil will be placed over the backfill material.
- The site will be seeded.

Map DS1798C shows the location of the portals, the underground workings and a picture of each portal. The Division usually requires maps and cross sections that show the premining, operational and reclaimed site. However, because the site is so small the Division will not require any additional maps and cross sections. The pictures and narrative provide enough information for the Division to analysis the reclamation plan and make a finding.

The pictures on Map DS1798C show that only a small highwall exists at the site (area of disturbance above the portal.) The reclamation plan calls for the area to be backfilled and grade. During the backfilling the highwalls will be eliminated. Since the reclaimed slopes will be 8 to 10 ft. high and have a 2 H to 1 V slope the site should be stable. The Division finds that the reclamation plan is adequate to meet the requirement of the coal rules.

Findings:

The Permittee has met the minimum regulatory requirements for the approximate original contour requirements.

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Minimum Regulatory Requirements:

General

Disturbed areas shall be backfilled and graded to: achieve the approximate original contour; eliminate all highwalls, spoil piles, and depressions; achieve a postmining slope that does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long term static safety factor of 1.3 and to prevent slides; minimize erosion and water pollution both on and off the site; and, support the approved postmining land use.

The postmining slope may vary from the approximate original contour when approval is obtained from the Division for a variance from approximate original contour requirements, or when incomplete elimination of highwalls in previously mined areas is allowed under the regulatory requirements. Small depressions may be constructed if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation.

If it is determined by the Division that disturbance of the existing spoil or underground development waste would increase environmental harm or adversely affect the health and safety of the public, the Division may allow the existing spoil or underground development waste pile to remain in place. Accordingly, regrading of settled and revegetated fills to achieve approximate original contour at the conclusion of underground mining activities shall not be required if: the settled and revegetated fills are composed of spoil or nonacid- or nontoxic-forming underground development waste; the spoil or underground development waste is not located so as to be detrimental to the environment, to the health and safety of the public, or to the approved postmining land use; stability of the spoil or underground development waste must be demonstrated through standard geotechnical analysis to be consistent with backfilling and grading requirements for material on the solid bench (1.3 static safety factor) or excess spoil requirements for material not placed on a solid bench (1.5 static safety factor); and, the surface of the spoil or underground development waste shall be vegetated in accordance with the revegetation standards for success, and surface runoff shall be controlled in accordance with the regulatory requirements for diversions.

Spoil shall be returned to the mined-out surface area. Spoil and waste materials shall be compacted where advisable to ensure stability or to prevent leaching of toxic materials. Spoil may be placed on the area outside the mined-out surface area in nonsteep slope areas to restore the approximate original contour by blending the spoil into the surrounding terrain if the following requirements are met: all vegetative and organic materials shall be removed from the area; the topsoil on the area shall be removed, segregated, stored, and redistributed in accordance with regulatory requirements; the spoil shall be backfilled and graded on the area in accordance with the general requirements for backfilling and grading.

Disposal of coal processing waste and underground development waste in the mined-out surface area shall be in accordance with the requirements for the disposal of spoil and waste materials except that a long-term static safety factor of 1.3 shall be achieved.

Exposed coal seams, acid- and toxic-forming materials, and combustible materials exposed, used, or produced during mining shall be adequately covered with nontoxic and noncombustible materials, or treated, to control the impact on surface and ground water, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved postmining land use.

Cut-and-fill terraces may be allowed by the Division where: needed to conserve soil moisture, ensure stability, and control erosion on final-graded slopes, if the terraces are compatible with the approved postmining land use; or, specialized grading, foundation conditions, or roads are required for the approved postmining land use, in which case the final grading may include a terrace of adequate width to ensure the safety, stability, and erosion control necessary to implement the postmining land-use plan.

Preparation of final-graded surfaces shall be conducted in a manner that minimizes erosion and provides a surface for replacement of topsoil that will minimize slippage.

Previously mined areas

Remining operations on previously mined areas that contain a preexisting highwall shall comply with all other reclamation requirements except as provided herein. The requirement that elimination of highwalls shall not apply to remining operations where the volume of all reasonably available spoil is demonstrated in writing to the Division to be insufficient to completely backfill the reaffected or enlarged highwall. The highwall shall be eliminated to the maximum extent technically practical in accordance with the following criteria:

1.) All spoil generated by the remining operation and any other reasonably available spoil shall be used to backfill the area. Reasonably available spoil in the immediate vicinity of the remining operation shall be included within the permit area.
2.) The backfill shall be graded to a slope which is compatible with the approved postmining land use and which provides adequate drainage and long-term stability.
3.) Any highwall remnant shall be stable and not pose a hazard to the public health and safety or to the environment. The operator shall demonstrate, to the satisfaction of the Division, that the highwall remnant is stable.
4.) Spoil placed on the outslope during previous mining operations shall not be disturbed if such disturbances will cause instability of the remaining spoil or otherwise increase the hazard to the public health and safety or to the environment.

Backfilling and grading on steep slopes

Underground mining activities on steep slopes shall be conducted so as to meet other applicable regulatory requirements and the requirements of this section. The following materials shall not be placed on the downslope: spoil; waste materials of any type; debris, including that from clearing and grubbing; abandoned or disabled equipment; land above the highwall shall not be disturbed unless the Division finds that this disturbance will facilitate compliance with the environmental protection standards and the disturbance is limited to that necessary to facilitate compliance; and, woody materials shall not be buried in the backfilled area unless the Division determines that the proposed method for placing woody material within the backfill will not deteriorate the stable condition of the backfilled area.

Special provisions for steep slope mining

No permit shall be issued for any operations covered by steep slope mining, unless the Division finds, in writing, that in addition to meeting all other regulatory requirements, the operation will be conducted in accordance with the requirements for backfilling and grading on steep slopes. Any application for a permit for surface coal mining and reclamation operations covered by steep slope mining shall contain sufficient information to establish that the operations will be conducted in accordance with the requirements for backfilling and grading on steep slopes.

This section applies to any person who conducts or intends to conduct steep slope surface coal mining and reclamation operations, except: where an operator proposes to conduct surface coal mining and reclamation operations on flat or gently rolling terrain, leaving a plain or predominantly flat area, but on which an occasional steep slope is encountered as the mining operation proceeds; where a person obtains a permit under the provisions for mountaintop removal mining; or, to the extent that a person obtains a permit incorporating a variance from approximate original contour restoration requirements.

Analysis:

General

Deer Creek Site

The general backfilling and grading requirements are that the site be restored to the approximate original contours; the elimination of all highwalls, spoil piles and depressions; have stable slopes; minimize erosion and water pollution both on and off the site; and support the approved postmining land use.

The Deer Creek site meets the general requirements for being reclaimed to the approximate original contour requirements. The general requirements are that the site blend into the surrounding area, the reclaimed drainages complement the natural drainages and highwalls are eliminated. Because the Deer Creek site is pre law, the Division will allow some highwall remnants to remain.

The main facilities are in steep canyons and were constructed before the enactment of SMCRA. The steep slopes and pre law development combine to prevent the permittee to restoring the site to the original configuration. However, the reclamation plan shows that the site will have a topography similar to the surrounding areas. See the final reclamation contour map and cross sections drawings (see drawings DS1782D, DS1783D and DS1784D for details). The restored channels will be in the bottom of the canyons and will complement the existing drainages.

The portals in the main Deer Creek facilities area were constructed before the enactment of SMCRA, May 3, 1978. Because the portals are pre SMCRA, the permittee does not have to completely eliminate the highwalls to comply with the AOC requirements.

The main problem that the permittee has with highwall elimination is lack of fill material. On drawing DS1782D, Deer Creek Mine Disturbed Area Final Reclamation Contour Map, the permittee shows the cut and fill quantities. The permittee shows that 175,918 cubic yards of cut material are available and 156,279 cubic yards of fill material are needed. The permittee is faced with a shortage of fill material. Since soil volume calculations are at best ± 10% and the difference between the cut material (material to be moved) to the fill material (material to be placed during reclamation) is 12% the Division considers the cut and fill quantities to balance.

The cross sections that show the cut slopes are shown on drawings DS1883D and DS1784D. The highwall at station 18+00 is at the base of a cliff. The permittee could place more fill against the highwall to eliminate it but would gain almost nothing. The steep cliff above the highwall is more of a safety hazard than the highwall itself. During reclamation the contractor could feather the restored slope with the natural slope so that the transition zone would appear almost natural.

The highwall located along stations 21+00 to 23+00 are also at the base of a steep natural cliff. The permittee could place more fill at the top of the highwall to eliminate it. However, the permittee would gain little because the natural cliff is more of a safety hazard than the highwall.

The highwalls will be reclaimed with 2H:1V slopes as shown in Appendix R645-301-500D. The cross sections for the reclaimed highwall on drawings DS1883D and DS1784D have slopes less than 20°. The reason for the gentler slope is that the cross sections are not perpendicular to the strike (maximum steepness) of the slope.

The safety factors for the reclaimed highwall slopes are greater than 1.3. The permittee could increase the slope angle and eliminate more highwall remnants. If the permittee were to increase the fill used to eliminate the highwalls then they would have to decrease the fill in other areas. A lack of fill in other areas could prevent the site from blending into the surrounding areas. R645-301-553.600 allows the permittee to leave pre SMCRA highwall remnants if they do not have enough fill material. The Division has reviewed the backfilling and grading plan and determined that the permittee does not have enough material on the site to eliminate the per SMCRA highwalls.

On drawing DS1783D, Deer Creek Mine Deer Creek Canyon Final Reclamation Cross Sections, the permittee shows the location of the concrete storage areas. Concrete will be used a fill material because of a lack of on site material.

Rilda Canyon

The breakouts at Rilda Canyon are post SMCRA. The reclamation contour map for Rilda Canyon is Map 4-1A Deer Creek Mine - Rilda Canyon Final Reclamation of Surface Facilities and Access Road (Drawing # CE-10884-EM) and the cross sections are shown on Map 4-4A Deer Creek Mine Rilda Canyon Access Road/Facilities Cross Sections (Drawing # CE-10891-EM). The reclamation plan calls for the complete elimination of all highwall in Rilda Canyon. The highwall remnents are shown on the cross section.

The permittee did not address slope stability at Rilda Canyon. The reclaimed slopes will have slope of 3H to 1V. In other areas slopes with angles of 2H to 1V have safety factors greater than 2. Based on other safety factor studies in the area the Division considers the slopes to be stable.

9th East Grimes Wash Portals

The portal site was originally disturbed by coal mining activities dating back prior to 1920. Evidence of the early mining activities can be seen by the remnants of 2 partially open portals, a coal handling area south of the portals and evidence of a wooden coal chute above the Wilberg Mine fan. The permittee reclaimed the area and the Division approved the as-built drawings on February 14, 2001. See Appendix XIV of Volume 3 of the MRP for more details.

9th East North Meetinghouse Portals

The 9th East North Meetinghouse Portals consist of two breakouts that are 20 ft long, 20 ft. wide and 8 ft. tall. The reclamation plan for the portals is as follows:

1. Backfill the portals for approximately 25 ft. from the opening using rock materials from inside the mine.
2. Construct a solid concrete block seal.
3. Remove all noncoal waste from the surface area. No coal waste is located at the site.
4. Backfill the portals openings at a 2 H to 1 V slope. Approximately 120 CY of material is needed per portal.
5. Soil will be placed over the backfill material.
6. The site will be seeded.

Map DS1798C shows the location of the portals, the underground workings and a picture of each portal. The Division usually requires maps and cross sections that show the premining, operational and reclaimed site. However, because the site is so small the Division will not

require any additional maps and cross sections. The pictures and narrative provide enough information for the Division to analysis the reclamation plan and make a finding.

The pictures on Map DS1798C show that only a small highwall exists at the site (area of disturbance above the portal.) The reclamation plan calls for the area to be backfilled and graded. During the backfilling the highwalls will be eliminated. Since the reclaimed slopes will be 8 to 10 ft. high and have a 2 H to 1 V slope the site should be stable. The Division finds that the reclamation plan is adequate to meet the requirement of the coal rules.

Variance From the Approximate Original Contour Requirements

The permittee did not request a variance from the approximate original contour requirements for any disturbed areas at the Deer Creek Mine.

Spoil and Underground Development Waste

The permittee conducted slope stability studies for the two refuse piles. The study for the refuse pile in Elk Canyon shows the reclaimed site will have a safety factor of 1.58. The study in Deer Creek shows the refuse pile will have a safety factor of 2.3. The Division reviewed the slope stability studies done by RB&C Engineering and considered them adequate to show that the reclaimed refuse piles will meet the minimum safety factor requirements.

R645-301-553.252 requires the permittee to cover all refuse piles with 4 feet of material unless the Division approve a lesser amount. On page 5-13 the permittee states that the results from chemical and physical analysis for the refuse are in given in Appendix R645-301-200A. However, Appendix R645-301-200A was not included in the submittal. The permittee committed to include the information when it became available.

On page 5-9 the permittee explains the reclamation of the refuse pile in Deer Creek as follows:

I. Suitable substitute soil as determined by the soil sampling/exploration program or barrow pit will be separated and stored in the area of the dismantled truck loadout and storage area (Area #2, see DS-1796-D in Appendix R645-301-500A). This soil will be used in areas where lesser quality soils exist and/or used as cover over the slope of the refuse pile in Deer Creek Canyon.

I. The material storage yard will be excavated and used as fill along the parameter of the material storage yard and portal area. The outslope of the refuse will also be excavated and used as fill in these areas. This will create a slope of less than 2:1.

The other sites were brake out portals and there was no refuse associated with those site.

Exposed Coal Seams

The permittee shows the location of the Blind Canyon coal seam in drawings DS1783D and DS1784D. Rider seams may occur in the area. However, the Division will only require the permittee to backfill coal seams that were uncovered due to mining activities. The lack of available fill material is the major reason that the Division will not require that all rider seams be backfilled.

Cut-and-Fill Terrances

The permittee does not plan to use any cut-and-fill terraces.

Previously Mined Areas

The Division made the finding that the permittee cannot eliminate all the highwall remnants at the Deer Creek mine due to lack of fill material. See the approximate original contour section of this TA for details.

Findings:

The Permittee has met the minimum regulatory requirements for the backfilling and grading sections of the coal regulations.

MINE OPENINGS

Regulatory Reference: 30 CFR 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Minimum Regulatory Requirements:

Each exploration hole, other drillhole or borehole, shaft, well, or other exposed underground opening shall be cased, lined, or otherwise managed as approved by the Division to prevent acid or other toxic drainage from entering ground and surface waters, to minimize disturbance to the prevailing hydrologic balance and to ensure the safety of people, livestock, fish and wildlife, and machinery in the permit area and adjacent area. Each exploration hole, drill hole or borehole or well that is uncovered or exposed by mining activities within the permit area shall be permanently closed, unless approved for water monitoring or otherwise managed in a manner approved by the Division. Use of a drilled hole or monitoring well as a water well must meet the provisions required to protect the hydrologic balance. This section does not apply to holes drilled and used for blasting, in the area affected by surface operations.

Each mine entry which is temporarily inactive, but has a further projected useful service under the approved permit application, shall be protected by barricades or other covering devices, fenced, and posted with signs, to prevent access into the entry and to identify the hazardous nature of the opening. These devices shall be periodically inspected and maintained in good operating condition by the person who conducts the underground mining activities.

Each exploration hole, other drill hole or borehole, shaft, well, and other exposed underground opening which has been identified in the approved permit application for use to return underground development waste, coal processing waste or water to underground workings, or to be used to monitor ground water conditions, shall be temporarily sealed until actual use.

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well, each shaft, drift, adit, tunnel, exploratory hole, entry way or other opening to the surface from underground shall be capped, sealed, backfilled, or otherwise properly managed, as required by the Division and consistent with the requirements of 30 CFR Section 75.1711. Permanent closure measures shall be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

Analysis:

The Deer Creek Mine has a total of 16 protals and 1 exhaust shaft. The permittee backfilled and sealed 7 portals, 4 of the sealed portals are in Deer Creek Canyon the other 3 are in Grimes Wash.

The general portal closure plan is shown on Figure 5-1. A block seal will be placed in the portal 25 feet from the entrance and then backfilled. The general portal sealing and backfilling plan is adequate for all portals in the Deer Creek site except the intake portal.

Deer Creek Intake Portals and Belt Portal

All portals except for the Deer Creek Canyon intake and belt portals are located up dip from the mined out entries. Because the portal are located up dip the permittee believes that hydraulic seals are not needed.

The Deer Creek intake and belt are located down dip from the coal seams. The Permittee does not want to place a hydrologic seal in the portal because the surrounding rock is fractured and water would seep around the seal. The Permittee will place pipes behind the seal and let the water flow through the pipe into the stream channel.

Rilda Canyon

The permittee states that the concrete portal liners with the two protals will be demolished and removed from the permit area for disposal at the Deer Creek Waste Rock Site. The portals will be sealed and backfilled as depicted in Figure 1, page 4-3. Backfill material will be obtained from the facility pad. The permittee's propose is consistent with the standard portal sealing procedures.

9th East Breakouts Grimes Wash Canyon

The 9th East Grimes Wash portals were developed in June 1977. The portals were used for intake ventilation from 1977 until 1990 when they were permanently sealed.

The portal site was originally disturbed by coal mining activities dating back prior to 1920. Evidence of the early mining activities can be seen by the remnants of 2 partially open portals, a coal handling area south of the portals and evidence of a wooden coal chute above the Wilberg Mine fan. On February 14, 2001, the Division approved the as-built drawings for the

reclamation work at the 9th East Grimes Wash portal. At that time the Division found the reclamation work met the minimum backfilling and grading requirements.

9th East North Meetinghouse Portals

The Permittee will backfill the portals for approximately 25 feet from within the mine. After backfilling the portals, the Permittee will place solid concrete block seals. This is the standard procedure to seal for portals.

On February 14, 2001, the Division approved the as-built drawings for the reclamation work at the 9th East Grimes Wash portals. At that time the Division found the reclamation work met the minimum backfilling and grading requirements.

Findings:

The Permittee has met the minimum regulatory requirements for the mine openings sections of the coal regulations.

TOPSOIL AND SUBSOIL

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

Minimum Regulatory Requirements:

Redistribution

Topsoil materials shall be redistributed in a manner that: achieves an approximately uniform, stable thickness consistent with the approved postmining land use, contours, and surface-water drainage systems; prevents excess compaction of the materials: and, protects the materials from wind and water erosion before and after seeding and planting.

Before redistribution of the material, the regarded land shall be treated if necessary to reduce potential slippage of the redistribution material and to promote root penetration. If no harm will be caused to the redistributed material and reestablished vegetation, such treatment may be conducted after such material is replaced.

The Division may choose not to require the redistribution of topsoil or topsoil substitutes on the approved postmining embankments of permanent impoundments or of roads if it determines that placement of topsoil or topsoil substitutes on such embankments is inconsistent with the requirement to use the best technology currently available to prevent sedimentation, and, such embankments will be otherwise stabilized.

Nutrients and soil amendments shall be applied to the initially redistributed material when necessary to establish the vegetative cover.

The Division may require that the B horizon, C horizon, or other underlying strata, or portions thereof, removed and segregated, stockpiled, be redistributed as subsoil in accordance with the requirements of the above if it finds that such subsoil layers are necessary to comply with the revegetation requirements.

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.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Minimum Regulatory Requirements:

Reclamation

A road not to be retained under an approved postmining land use shall be reclaimed in accordance with the approved reclamation plan as soon as practicable after it is no longer needed for mining and reclamation operations. This reclamation shall include: closing the road to traffic; removing all bridges and culverts unless approved as part of the postmining land use; removing or otherwise disposing of road-surfacing materials that are incompatible with the postmining land use and revegetation requirements; reshaping cut and fill slopes as necessary to be compatible with the postmining land use and to complement the natural drainage pattern of the surrounding terrain; protecting the natural drainage patterns by installing dikes or cross drains as necessary to control surface runoff and erosion; and, scarifying or ripping the roadbed, replacing topsoil or substitute material and revegetating disturbed surfaces.

Retention

A road to be retained for an approved postmining land use shall be classified as a primary road and designed constructed and maintained in accordance with the requirements for primary roads and in consideration of the approved postmining land use.

Analysis:

Reclamation

The Permittee plans to reclaim all roads at the Deer Creek mine site. They also plan to reclaim the access road for the C1 and C2 belt line. The road reclamation plan is as follows:

> The remainder of the Deer Creek mine road to the Emery County road (asphalt and base) will be excavated and transported to the waste rock site for disposal. Excavation will extend approximately 410 feet past station 0+00, to the point where the county road terminates. Approximately 25,042 cubic yards of material will be cut and 21,301 cubic yards of fill will be moved in this area. A 100-foot diameter turnaround (unpaved) will be constructed at the end of the Emery County road so that vehicular traffic can exit the area properly.

The plan meets the minimum requirements of R645-301-542.600 because (1) the road will be removed because it is not needed for the postmining land use, (2) the road bed will be reseeded according to the approved reclamation plan and (3) the asphalt rubble will be disposed at the waste rock site.

Findings:

The Permittee met the minimum regulatory requirements for the roads section of the reclamation requirements of the coal rules.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Minimum Regulatory Requirements:

Hydrologic reclamation plan

The application shall include a plan, with maps and descriptions, indicating how the relevant regulatory requirements will be met. The plan shall be specific to the local hydrologic conditions. It shall contain the steps to be taken during mining and reclamation through bond release to minimize disturbance to the hydrologic balance within the permit and adjacent areas; to prevent material damage outside the permit area; and to meet applicable Federal and State water quality laws and regulations. The plan shall include the measures to be taken to: avoid acid or toxic drainage; prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow; provide water treatment facilities when needed; and control drainage. The plan shall specifically address any potential adverse hydrologic consequences identified in the PHC determination and shall include preventive and remedial measures.

Each application shall contain descriptions, including maps and cross sections, of stream channel diversions and other diversions to be constructed within the proposed permit area to achieve compliance with the performance standards for those structures.

Postmining rehabilitation of sedimentation ponds, diversions, impoundments, and treatment facilities

Before abandoning a permit area or seeking bond release, the operator shall ensure that all temporary structures are removed and reclaimed, and that all permanent sedimentation ponds, diversions, impoundments, and treatment facilities meet the requirements of this Chapter for permanent structures, have been maintained properly and meet the requirements of the approved reclamation plan for permanent structures and impoundments. The operator shall renovate such structures if necessary to meet the requirements of this Chapter and to conform to the approved reclamation plan.

Analysis:

Water Quality Standards and Effluent Limitations

The operator has provided a water monitoring plan in Appendix A of Volume 9 (which covers Deer Creek, Cottonwood-Wilberg, and Des-Bee-Dove Mines). The plan contains a commitment on page 177 of Volume 9 that discharges of water from areas disturbed by coal mining and reclamation operations will be made in compliance with all Utah and federal water-quality laws and regulations and with effluent limitations for coal mining promulgated by the EPA and set forth in 400CFR Part 434. UPDES information is in Appendix B, Volume 9.

In Table 7-1 of the Deer Creek Mine Reclamation Plan, the operator has provided the values for the parameters used in RUSLE to estimate annual sediment contributions to Deer Creek from reclaimed watersheds. A 3.5" computer disc with the information used to determine sediment loss for the seven disturbed areas shown on Drawing DS-1795-D (Appendix R645-301-700-C) is included in Appendix 700-C.

The R-factor was determined using the data in the CITY database within RUSLE for the nearby Hiawatha area. Hiawatha is #44399 in the applicant's data base, found on the 3.5" disc (Hiawatha is not in the standard database that comes with RUSLE).

It states on page 7-3 that the estimation of the K-factor was based on average percentages of sand, silt, and clay from the soil analyses in Appendix R645-301-200-C. No data were available for percent rock-cover, so the average percent rock-cover at the recently reclaimed Cottonwood Fan Portal area (1999 Vegetation Report, p. 243) was used. The estimated K-factor used in the calculations was 0.225.

In determining the C-factor for the RUSLE calculations for the disturbed areas, maximum roughness was used because of the planned pocking, and entries for other ground covers such as rock fragments and vegetative residue were used conservatively because no data have been established.

The hillslope lengths and gradients used in determining the LS-factor for input to RUSLE are shown on Drawing DS-1795-D in Appendix R645-301-700-C (page 7-3).

The P-factor calculations in RUSLE yield not only the conservation planning value of the system (the P-factor itself), but also the Sediment Delivery Ratio (SDR). Both values are calculated in RUSLE and shown in the Spreadsheet Table generated by RUSLE. The P value in the table should be used for conservation planning, while the SDR should be used to estimate off-slope impact. When R * K * LS * C are multiplied by P, the result is the A value (estimated soil loss) in the RUSLE Spreadsheet Table, while multiplying R * K * LS * C by SDR gives an estimate of the sediment yield (SY). Table 7-1 tabulates the input and results of calculating A.

R*K*LS*C*P = A (estimated soil loss – Table 7-1)

R*K*LS*C*SDR = SY (estimated sediment yield)

Diversions

Two ephemeral draws in Elk Canyon have been included in the channel design (DS-1780D) and final reclamation contour map (DS-1782D). Small ephemeral draws between the Terrace Enhancement Project area and Deer Creek may collect and convey water. The drainage areas of these small draws are not significant enough to require designed channels, but these are areas with the potential for gully formation. **NOTE**: the reference stations on DS1780D are measured along the channel length and do not correspond with the cross-section locations on DS1782D.

On page 104 of Volume 9, Deer Creek is described as an ephemeral stream based on observations by the operator; however, because the stream drains an area of more than one square mile, it is an intermittent stream by the definition in the Coal Mining Rules. Considered separately from the Deer Creek drainage, Deer and Elk are each an ephemeral drainage.

Design capacity for permanent, intermittent stream-channel diversions needs to be at least equal to the unmodified channel upstream and downstream from the diversion and able to safely pass a 100-year, 6-hour event. Small-scale cross sections of the unmodified channel immediately upstream and downstream of the site are on Drawing DS-1783-D, along with design cross sections for the reclaimed channels. Based on the NOAA Precipitation Frequency Atlas, 2.4 inches is the value for the 100-year, 6-hour storm event. Flows that would result from such a storm event were determined for Deer Creek Canyon, Deer Canyon, and Elk Canyon using STORM. Calculated watershed hydrographs are in Appendix 700-A, and results are summarized in Table 7-2. Five storm hydrographs were constructed: three for each of the drainages, one for routing Deer Canyon into Deer Creek Canyon, and one for routing all three drainages together. The designed drainage channel characteristics are summarized in Table 7-3 and channel design results are in Appendix 700-D.

Designs for channel transitions between the upstream and downstream natural channel to the reclaimed channels are shown on Figure 7-1A. Soft bioengineering methods for channel

reclamation are described in on page 7-13 and designs are included in Figure 7-2A. These are to be used on three reaches where slopes are less than 5%. Dick Rol, formerly with the Division's AML section, reviewed these plans and the following evaluation is based on his comments.

1. The design for using root wads in the transition areas looks acceptable. Having log ends pointing downstream is acceptable, but it is imperative that the operator plant enough sedges and willows behind the logs.

2. The value of placing anything in the middle of the channel is questionable. Placing wattles in the middle of the stream is a practice with which Dick is not familiar. Wattles are mainly intended for streambank protection, not for trying to establish islands. Using them to establish islands might work in some situations, but this doesn't appear to be a good place; nevertheless, it might be worth trying with one or two as an experimental practice.

3. Rocks in the middle of the channel will impede the flow and tend to create scour points that could become nick points.

4. The base material for the channel is a concern. Sieve analysis is not discussed, and probably cannot be known until the channel is actually excavated. The operator needs to commit to do sieve analyses during reclamation to help determine a stable final channel design.

5. A riprap channel with lots of vegetation on the sides would be a reasonable design option.

In response to Mr. Rol's comments, the commitment is made on page 7-13 to do sieve analyses and, if the particle-size is not sufficient to control down-cutting erosion, to modify the design to either control flow velocities to better armor the streambed. In comments included with the March 8, 2001 response to deficiencies, the permittee commented that Mr. Rol's comments were appreciated but that based on their evaluation, the stream channel as designed would be stable. The placement of logs, boulder clusters, willow wattles, etc. will direct flow towards the center of the channel in a meandering fashion. Willow wattles and U- or V-shaped weirs will provide flow dissipation to slow velocities and promote sedimentation.

Designs for the channel transitions between the upstream and downstream natural channel and the reclaimed channel are on Drawing 7-1A in Appendix 700-B, and designs for energy dissipation basins are on Figure 7-3A. Locations for these structures are shown on Drawing DS-1780-D. **NOTE**: the reference stations on DS1780D are measured along the channel length and do not correspond with the cross-section locations on DS1782D.

The operator provided riprap and granular filter material designs for the riprapped reclamation channels. Riprap gradation calculations are in Appendix 700-E. Calculations and

assumptions that were used to determine Manning's 'n' for the riprap channel have been included on page 7-11 in the proposed reclamation plan.

Maps are certified. Hydraulic analysis, calculations, designs, and drawings in the Hydrology Section are certified by John Christensen, Licensed Professional Engineer.

Findings:

The plan meets minimum regulatory requirements for this section.

STABILIZATION OF SURFACE AREAS

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

Minimum Regulatory Requirements:

All exposed surface areas shall be protected and stabilized to effectively control erosion and air pollution attendant to erosion. Rills and gullies which form in areas that have been regraded and topsoiled and which either disrupt the approved postmining land use or the reestablishment of the vegetative cover, or, cause or contribute to a violation of water quality standards for receiving streams, shall be filled, regraded, or otherwise stabilized; topsoil shall be replaced; and the areas shall be reseeded or replanted.

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:

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.

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MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Minimum Regulatory Requirements:

Each application shall contain maps, plans, and cross sections which show the reclamation activities to be conducted, the lands to be affected throughout the operation, and any change in a facility or feature to be caused by the proposed operations, if the facility or feature was shown and described as an existing structure.

The permit application must include as part of the reclamation plan information, the following maps, plans and cross sections:

Affected area boundary maps

The boundaries of all areas proposed to be affected over the estimated total life of all mining activities and reclamation activities, with a description of size, sequence, and timing of phased reclamation activities and treatments. All maps and cross sections used for reclamation design purposes shall clearly show the affected and permit area boundaries in reference to the reclamation work being accomplished.

Bonded area map

The permittee shall identify the initial and successive areas or increments for bonding on the permit application map and shall specify the bond amount to be provided for each area or increment. The bond or bonds shall cover the entire permit area, or an identified increment of land within the permit area upon which the operator will initiate and conduct surface coal mining and reclamation operations during the initial term of the permit. As surface coal mining and reclamation operations on succeeding increments are initiated and conducted within the permit area, the permittee shall file with the Division an additional bond or bonds to cover such increments. Independent increments shall be of sufficient size and configuration to provide for efficient reclamation operations should reclamation by the Division become necessary.

Reclamation backfilling and grading maps

Contour maps and cross sections to adequately show detail and design for backfilling and grading operations during reclamation. Where possible, cross sections shall include profiles of the pre-mining, operations, and post-reclamation topography. Contour maps shall be at a suitable scale and contour interval so as to adequately detail the final surface configuration. When used in the formulation of mass balance calculations, cross sections shall be at adequate scale and intervals to support the mass balance calculations. Mass balance calculations derived from contour information must demonstrate that map scale and contour accuracy are adequate to support the methods used in such earthwork calculations. Detailed cross sections shall be provided when required to accurately depict reclamation designs which include, but are not limited to: terracing and benching, retained roads, highwall remnants, slopes requiring geotechnical analysis, and embankments of permanent impoundments.

Reclamation facilities maps

Location of each facility that will remain on the proposed permit area as a permanent feature, after the completion of underground mining activities. Location and final disposition of each sedimentation pond, permanent water impoundment, coal processing waste bank, and coal processing water dam and embankment, disposal areas for underground development waste and excess spoil, and water treatment and air pollution control facilities within the proposed permit area to be used in conjunction with phased reclamation activities or to remain as part of reclamation.

Final surface configuration maps

Sufficient slope measurements to adequately delineate the final surface configuration of the area affected by surface operations and facilities, measured and recorded according to the following: each measurement shall consist of an angle of inclination along the prevailing slope extending 100 linear feet above and below or beyond the coal outcrop or the area disturbed or, where this is impractical, at locations specified by the Division; where the area has been previously mined, the measurements shall extend at least 100 feet beyond the limits of mining disturbances, or any other distance determined by the Division to be representative of the post-reclamation configuration of the land; and, slope measurements shall take into account variations in slope, to provide accurate representation of the range of slopes and reflect geomorphic differences of the area disturbed through reclamation activities.

Reclamation monitoring and sampling location maps

Elevations and locations of test borings and core samplings. Elevations and locations of monitoring stations used to gather data on water quality and quantity, subsidence, fish and wildlife, and air quality, if required, to demonstrate reclamation success.

Reclamation surface and subsurface manmade features maps

The location of all buildings in and within 1,000 feet of the proposed permit area, with identification of the current or proposed use of the buildings at the time of final reclamation. The location of surface and subsurface manmade features within, passing through, or passing over the proposed permit area, including, but not limited to, major electric transmission lines, pipelines, fences, and agricultural drainage tile fields. Each public road located in or within 100 feet of the proposed permit area and all roads within the permit area which are to be left as part of the post-mining land use. Buildings, utility corridors, and facilities to be used in conjunction with reclamation or to remain for final reclamation.

Reclamation treatments maps

The location and boundaries of any proposed areas for reclamation treatments including but not limited to: location, extent and depth of materials used for resoiling; location, extent and types of treatments for revegetation including soil preparation, soil amendments, mulching, seeding, variations in seed mixtures, and other revegetation treatments. Each water diversion, collection, conveyance, treatment, storage and discharge facility to be used during reclamation. Each facility to be used to protect and enhance fish and wildlife related environmental values. other treatments or applications which are specifically designed or required as part of phased or final reclamation activity.

Certification Requirements.

Cross sections, maps, and plans required to show the design, location, elevation, or horizontal or vertical extent of the land surface or of a structure or facility used to conduct mining and reclamation operations shall be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, a professional geologist, or in any State which authorizes land surveyors to prepare and certify such cross sections, maps, and plans, a qualified, registered, professional land surveyor, with assistance from experts in related fields such as landscape architecture.

Each detailed design plan for an impounding structure that meets or exceeds the size or other criteria of the Mine Safety and Health Administration, 30 CFR Section 77.216(a) shall: be prepared by, or under the direction of, and certified by a qualified registered professional engineer with assistance from experts in related fields such as geology, land surveying, and landscape

architecture; include any geotechnical investigation, design, and construction requirements for the structure; describe the operation and maintenance requirements for each structure; and, describe the timetable and plans to remove each structure, if appropriate.

Each detailed design plan for an impounding structure that does not meet the size or other criteria of 30 CFR Section 77.216(a) shall: be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, or in any State which authorizes land surveyors to prepare and certify such plans, a qualified, registered, professional land surveyor, except that all coal processing waste dams and embankments shall be certified by a qualified, registered, professional engineer; include any design and construction requirements for the structure, including any required geotechnical information; describe the operation and maintenance requirements for each structure; and, describe the timetable and plans to remove each structure, if appropriate.

Analysis:

Reclamation Backfilling and Grading Maps

Deer Creek Canyon

The main facilities for the mine are located in Deer Creek Drainage, Deer Drainage and Elk Canyon Drainage. Drawing DS1782D, Deer Creek Mine Disturbed Area Final Reclamation Contour Map show the reclamation contours for those areas. The map scale is 1" = 100', which is adequate for the Division to verify mass balance calculations. The map has been certified by a professional engineer and shows the highwall remnants. The map does not have the disturbed area boundaries labeled.

The cross sections are shown on Drawing DS1783D and DS1784D, Deer Creek Mine, Deer Creek Canyon Final Reclamation Cross Sections. The cross sections are at a scale of 1" = 80', which is different from the base map. The permittee does not want to change the scale of the map for fear of losing details. While the Division recommends that the scales of the base maps and cross sections be the same no action will be taken at this time.

Rilda Canyon

The backfilling map for Rilda Canyon is drawing CE-10884-EM. The map shows the reclaimed contours for the site and the riprap. The map scale is 1" = 100'.

The cross sections are on drawing CE-10891-EM and do not show the location of the portals, highwalls or disturbed area boundaries. The cross section scale is 1" = 20' which is not equal to the base map scale. The Division's staff prefers to have the scales of the maps and cross sections the same when practical.

9th East Grimes Wash Portals

The permittee did not include backfilling and grading maps for the 9th East North Meetinghouse Portals. The permittee needs to include as-built drawing for the area.

9th East North Meetinghouse Portals

The permittee did not include backfilling and grading maps for the 9th East North Meetinghouse Portals. The permittee did state in Appendix R645-301-301-500-B that the reclamation plan for the area would be updated when it because available. The backfilling and grading plans must be approved by the Division before the reclamation plan can be approved.

Reclamation Facilities Maps

Deer Creek Canyon

The main facilities for the mine are located in Deer Creek Drainage, Deer Drainage and Elk Canyon Drainage. Drawing DS1782D, Deer Creek Mine Disturbed Area Final Reclamation Contour Map show the reclamation contours for those areas. The cross sections are shown on Drawing DS1783D and DS1784D, Deer Creek Mine, Deer Creek Canyon Final Reclamation Cross Sections. The maps and cross sections show the rip rapped drainages and energy dissipaters. No other reclamation facilities are shown.

Rilda Canyon

Drawing CE-10884-EM shows the location of the reclamation facilities for Rilda Canyon. Those facilities consist of riprapped channels.

9th East Grimes Wash Portals

The permittee gave the Division as-built drawings for the 9th East Grimes Wash Portal area in a separate amendment that was approved on February 12, 2001.

9th East North Meetinghouse Portals

Map DS1798C shows the location of the portals, the underground workings and a picture of each portal. The Division usually requires maps and cross sections that show the premining, operational and reclaimed site. However, because the site is so small the Division will not require any additional maps and cross sections. The pictures and narrative provide enough information for the Division to analysis the reclamation plan and make a finding.

The pictures on Map DS1798C show that only a small highwall exists at the site (area of disturbance above the portal.) The reclamation plan calls for the area to be backfilled and grade. During the backfilling the highwalls will be eliminated. Since the reclaimed slopes will be 8 to 10 ft. high and have a 2 H to 1 V slope the site should be stable. The Division finds that the reclamation plan is adequate to meet the requirement of the coal rules.

Final Surface Configuration Maps

The backfilling and grading maps show the final surface configuration.

Findings:

The Permittee met the minimum regulatory requirements for this section of the regulations.

BONDING AND INSURANCE REQUIREMENTS

Regulatory Reference: 30 CFR 800; R645-301-800, et seq.

Minimum Regulatory Requirements:

General

After a permit application has been approved, but before a permit is issued, the applicant shall file with the Division, on a form prescribed and furnished by the Division, a bond or bonds for performance made payable to the Division and conditioned upon the faithful performance of all the requirements of the Act, the regulatory program, the permit, and the reclamation plan.

The bond or bonds shall cover the entire permit area, or an identified increment of land within the permit area upon which the operator will initiate and conduct surface coal mining and reclamation operations during the initial term of the permit. As surface coal mining and reclamation operations on succeeding increments are initiated and conducted within the permit area, the permittee shall file with the Division an additional bond or bonds to cover such increments.

The operator shall identify the initial and successive areas or increments for bonding on the permit application map and shall specify the bond amount to be provided for each area or increment. Independent increments shall be of sufficient size and configuration to provide for efficient reclamation operations should reclamation by the Division become necessary.

An operator shall not disturb any surface areas, succeeding increments, or extend any underground shafts, tunnels, or operations prior to acceptance by the Division of the required performance bond.

The applicant shall file, with the approval of the Division, a bond or bonds under one of the following schemes to cover the bond amounts for the permit area as determined: a performance bond or bonds for the entire permit area; a cumulative bond schedule and the performance bond required for full reclamation of the initial area to be disturbed; or, an incremental-bond schedule and the performance bond required for the first increment in the schedule.

Form of bond

The Division shall prescribe the form of the performance bond. The Division may allow for: a surety bond; a collateral bond; a self-bond; or a combination of any of these bonding methods.

Performance bond liability shall be for the duration of the surface coal mining and reclamation operation and for a period which is coincident with the operator's period of extended responsibility for successful revegetation or until achievement of the reclamation requirements of the Act, regulatory programs, and permit, whichever is later.

With the approval of the Division, a bond may be posted and approved to guarantee specific phases of reclamation within the permit area provided the sum of phase bonds posted equals or exceeds the total amount required. The scope of work to be guaranteed and the liability assumed under each phase bond shall be specified in detail.

Isolated and clearly defined portions of the permit area requiring extended liability may be separated from the original area and bonded separately with the approval of the Division. Such areas shall be limited in extent and not constitute a scattered, intermittent, or checkerboard pattern of failure. Access to the separated areas for remedial work may be included in the area under extended liability if deemed necessary by the Division.

The bond liability of the permittee shall include only those actions which he or she is obligated to take under the permit, including completion of the reclamation plan, so that the land will be capable of supporting the postmining land use approved.

Implementation of an alternative postmining land use which is beyond the control of the permittee, need not be covered by the bond. Bond liability for prime farmland shall be specific to include productivity requirements.

Determination of bond amount

The amount of the bond required for each bonded area shall: be determined by the Division; depend upon the requirements of the approved permit and reclamation plan; reflect the probable difficulty of reclamation, giving consideration to such factors as topography, geology, hydrology, and revegetation potential; and, be based on, but not limited to, the estimated cost submitted by the permit applicant.

The amount of the bond shall be sufficient to assure the completion of the reclamation plan if the work has to be performed by the Division in the event of forfeiture, and in no case shall the total bond initially posted for the entire area under 1 permit be less than $10,000.

An operator's financial responsibility for repairing material damage resulting from subsidence may be satisfied by the liability insurance policy required in this section.

Terms and conditions for liability insurance

The Division shall require the applicant to submit as part of its permit application a certificate issued by an insurance company authorized to do business in the United States certifying that the applicant has a public liability insurance policy in force for the surface coal mining and reclamation operations for which the permit is sought. Such policy shall provide for personal injury and property damage protection in an amount adequate to compensate any persons injured or property damaged as a result of the surface coal mining and reclamation operations, including the use of explosives, and who are entitled to compensation under the applicable provisions of State law. Minimum insurance coverage for bodily injury and property damage shall be $300,000 for each occurrence and $500,000 aggregate.

The policy shall be maintained in full force during the life of the permit or any renewal thereof and the liability period necessary to complete all reclamation operations under this Chapter.

The policy shall include a rider requiring that the insurer notify the Division whenever substantive changes are made in the policy including any termination or failure to renew.

The Division may accept from the applicant, in lieu of a certificate for a public liability insurance policy, satisfactory evidence from the applicant that it satisfies applicable State self-insurance requirements approved as part of the regulatory program and the requirements of this section.

Analysis:

Determination of Bond Amount

The Permittee did not include a revised reclamation cost estimate in the amendment. The Division was informed by the Permittee that a cost estimate would not be included until the reclamation plan was approved. The Division agreed with the concept since the reclamation bond estimate must be based on the approved plan.

Terms and Conditions for Liability Insurance

Findings:

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

R645-301-830.130, The Permittee did not include a detailed reclamation cost estimate in the amendment. The Permittee informed the Division that the reclamation cost estimate would not be submitted until the reclamation plan was approved. The Division agreed to that procedure. Prior to final approval the Permittee must submit a detailed reclamation cost estimate.