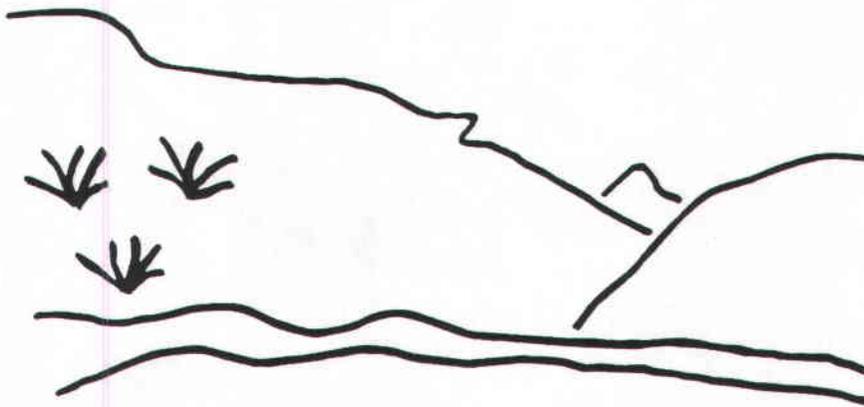


State of Utah



Utah Oil Gas and Mining

Coal Regulatory Program

Des-Bee-Dove
Phase 2 Reclamation
C/015/017-AM01D -1
Technical Analysis
August 14, 2002

File in:

Confidential

Shelf

Expandable

Refer to Record No. 0009

Date 08/15/2002

In C 015cd 7, 2002 Outgoing
For additional information



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

COPY

OK

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August 15, 2002

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

Re: Phase 2 Reclamation, PacifiCorp, Des-Bee-Dove Mine, C/015/017-AM01D-1, 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 November 13, 2002.

If you have any questions, please call me at (801) 538-5268 or Jim Smith at (801) 538-5262.

Sincerely,

Pamela Grubaugh-Littig
Permit Supervisor

an
Enclosure
cc: Price Field Office
P:\GROUPS\COAL\WP\015017.DBD\FINAL\DEF01D-1.DOC

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INTRODUCTION

TECHNICAL ANALYSIS

INTRODUCTION

The Deseret, Beehive, and Little Dove Mines were temporarily sealed in 1987. In 1999 the permit was taken out of temporary cessation, and reclamation began with demolition of surface facilities and sealing of the portals. The reclamation plan is being modified because the Tipple pad, which was to have been left basically unreclaimed under the old plan, was excavated to recover the coal that had been incorporated during its construction.

Proposed amendment C/015/017-AM01D is for reclamation of what Energy West calls the Phase 2 area, 22 acres that include the remaining roads within the Des-Bee-Dove permit area, the Deseret Mine portals and pad, the Bathhouse pad, the remainder of the Tipple pad, and all other disturbed areas within the disturbed-area boundary. The access road will be reclaimed to the cattle guard that marks the end of the county road, but reclamation will include conversion of a portion of the road to a cattle trail. A drainage will be carved out of the Deseret Mine pad and Tipple yard and the storage yard area.

Substitute topsoil will be reapplied to approximately 8.4 acres of regraded slopes on the bathhouse pad and in the lower main drainage and at the Deseret portal and access road to the Beehive portal. The Bathhouse pad and outslope will be the repository of coal mine waste and a source of cover material, including substitute topsoil. An undisturbed area to the west of the tipple yard will also supply cover material. The Division hesitates to approve disturbance of this "island" for topsoil cover and would recommend that this area be utilized only after all other sources are exhausted.

Initial reclamation of the Phase 1 area – the Little Dove and Beehive pad, the water tank pad, the substation pad, and related roads – was completed in May 2002. Neither Phase 1 nor Phase 2 includes reclamation of the sedimentation pond.

A technical analysis generated by the Utah Division of Oil, Gas, and Mining relative to the Phase 2 reclamation plan at the Des-Bee-Dove Mine contained several deficiencies and was forwarded to the permittee on January 15, 2002. The Division received the response on May 2, 2002. All information required to approve this amendment has not been included in the May 2 submittal and this amendment should not be approved.

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C/015/017-AM01D-1
August 14, 2002

INTRODUCTION

SUMMARY OF DEFICIENCIES

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

- R645-201-232.200, (1) The submittal must describe separate handling (removal & storage) of the surface three feet of bathhouse outslope soils. (2) The submittal must indicate the Permittee's intention to utilize the undisturbed "island" south of the Tipple yard for substitute topsoil as a last resort after other alternatives have been exhausted and after consulting with the Division and obtaining the Division's concurrence. (3) The Permittee must evaluate increasing the area of substitute topsoil salvage from the southern portion of the bathhouse outslope. 16
- R645-301-121.200, The Permittee must consistently identify the location of the Phase 2 Reclamation information as Appendix XVI, not XV. See the front cover of the binder and the laminated title page in the submittal. 5
- R645-301-121.200, The title page for Appendix A must be corrected to reflect that the photos were taken during reclamation. 5
- R645-301-140, The cross-section -1+00 for Drawing 200-1 must be included with the submittal. 6
- R645-301-242.100, The Division recognizes the need for flexibility between the submittal and field work, therefore, the submittal must include a commitment that Permittee will keep a weekly written accounting of the volume of substitute topsoil separated and stored; and the volume of topsoil redistributed at the site. The weekly accounting must be available on site for review by DOGM staff. 16

make stipulation

- R645-301-242.120, -242.130, The Permittee should include in Section 500 Table 1, Procedural

SUMMARY OF DEFICIENCIES

Steps of Reclamation Timetable instruction for the contractor to handle soils only when they are in a loose or friable condition or when the moisture content is an optimal 10 – 15%. Generally, two rules apply: a) If the soil sticks to the equipment, wait until the soil has dried to a friable state. b) If the soil is too dry and hard to handle, resembling flour, add water until the soil is wetted to a loose, friable condition..... 16

R645-301-340, Methods to effectively incorporate mulch, prepare a seed bed and revegetate a 1¼ h:1v slope must be described. 44

R645-301-353, The Tipple and Desert pads must have greater amounts of substitute topsoil applied than the current six inches or the number of transplants in this area increased to 750 per acre or other methods described to assure revegetation success. 44

R645-301-358, The Operator must commit to the restrictions concerning the eagle protection as stated above..... 22

R645-301-410, Please add a description of the use of the Church Mine Trail by locals to reenact the settlement of Huntington..... 12

R645-301-411.140, The application must address the potential for this site to be eligible to the Nation Register of Historic Places..... 7

R645-301-553.260, -553.252, The application must include a commitment to cover coal processing waste with four feet of clean fill and indicate a method by which the depth of clean fill will be monitored over coal processing waste (coal spills) and underground development waste during grading..... 19

R645-301-746.120, -731.310, -731.311, The plan must include a commitment to sample the main drainage at the location of each cross section from 3+00 through 12+00 shown on Drawing #500-3. The Permittee may choose to sample the final grade at a depth below four feet before placement of Type II filter bedding or continuously during grading of the fill. Analysis will include laboratory measurement of pH, EC, SAR, acid/base accounting, Boron, and Selenium..... 42

R645-301-752, The Permittee needs to do the RUSLE soil-loss calculations using the laboratory soil testing results in Exhibit B of Appendix C that include the very-fine sand fraction. 42

GENERAL CONTENTS

GENERAL CONTENTS

PERMIT APPLICATION FORMAT AND CONTENTS

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

Analysis:

The Table of Contents identifies the Phase 2 Reclamation Plan as Appendix XVI of Volume 5 and that it is a separate booklet or binder. Because information in the Phase 2 submittal contradicts information in the Mining and Reclamation Plan (MRP), a notice stating Appendix XVI will take precedence over contradictions to Volume 2 Part 4 is provided to be placed at the beginning of Volume 2 Part 4.

The sheet in the binder cover and the laminated sheet inside identify this as Appendix XV, rather than XVI. Appendix XV already exists in the MRP and this submittal is not intended to replace it. The Permittee needs to clearly identify this Phase 2 Reclamation Amendment as Appendix XVI, not XV.

The Phase 2 Plan refers frequently to Appendix XIV Phase 1 Reclamation Plan for soils information from trenching of the site during the week of December 3, 2001. The Permittee should revise page 11 to indicate that all soils information is found only in Appendix XIV Phase 1 Reclamation Plan.

Appendix A contains photos titled Pre-Reclamation Site Photos. The Permittee has referred to the valley fill removal as reclamation activities. The title page must be corrected to reflect that these photos were taken during reclamation.

Cut and fill information provided in Appendix C of Section R645-500 has been recalculated for this submittal.

Findings:

Information provided in the proposed amendment is not considered adequate to meet the requirements of the Permit Application Format and Contents section of the regulations. Prior to approval, the Permittee must provide the following in accordance with:

R645-301-121.200, The title page for Appendix A must be corrected to reflect that the photos were taken during reclamation.

R645-301-121.200, The Permittee must consistently identify the location of the Phase 2 Reclamation information as Appendix XVI, not XV. See the front cover of the binder and the laminated title page in the submittal.

REPORTING OF TECHNICAL DATA

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

Analysis:

Mr. Dan Larsen, Soil Scientist, EIS Environmental & Engineering Consulting, conducted the soils investigations as a basis of forming a reclamation salvage and replacement strategy. Mr. Larsen's report is found in Appendix XIV Phase 1 Section 200, Appendix C. Appendix C is referred to in the submittal under "Reporting of Technical Data.

As reported in Appendix C of Appendix XIV Phase 1, laboratory work was performed by Intermountain Laboratories, Inc., Sheridan Wyoming.

Findings:

Information provided meets the requirements of Reporting of Technical Data section of the Regulations.

MAPS AND PLANS

Regulatory Reference: 30 CFR 777.14; R645-301-140.

Analysis:

Drawing #: CS1813E, Surface Yard Area Pre/Post SMCRA Development Map shows aerial photographs from 1977, 1978, and 1999. The photographs are marked to show current, pre-SMCRA and post-SMCRA disturbance. The only post-SMCRA disturbance is the parking lot extension at the bathhouse pad. It is difficult to compare one photograph to the next and determine disturbance because the photographs were not taken from the same location but they are sufficient to determine pre and post-SMCRA disturbances.

Cross section -1+00 is missing from Drawing 200-1.

Findings:

Information provided does not meet the minimum requirements of the Maps and Plans section of the regulations. Prior to approval, the Permittee must provide the following in accordance with:

R645-301-140, The cross-section -1+00 for Drawing 200-1 must be included with the submittal.

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.12; R645-301-411.

Analysis:

Numerous references are given throughout the application to historic structures and locations. The use of the term historic is thought to just mean old and not significant to the historic register. The use of the word historic has regulatory connotations and probably should not be used except when referring to structures eligible to the historic register. Because of the use of this term the Permittee must have the disturbed area surveyed for historic significance.

An archeological and cultural survey was conducted in the area in 1980. Early cultural and historic surveys did not consider structures and facilities on the mine site during the survey. Structures that were not eligible because of age in initial surveys may now be over 50 years old. Recently the Division has been requiring re-survey of mine sites with structures and facilities over 50 years old. The application must address the potential for this site to be eligible to the Nation Register of Historic Places.

Findings:

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

R645-301-411.140, The application must address the potential for this site to be eligible to the Nation Register of Historic Places.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.21; R645-301-322.

Analysis:

The Phase 1 application contains a map titled Des-Bee-Dove Mines Phase 1 Reclamation Raptor Location Map. The map shows Golden Eagle nest #952 and 937 are both within the half-mile buffer zone radius of the proposed work area. Chris Colt, DWR Biologist, surveyed these nests. Nest 952 is in direct line of site of the mine facilities and less than 1000 feet away.

The following data is available for this nest:

2001- Inactive
2000- Active
1999 – N/A
1998 – N/A

Findings:

The information provided in the application meets the minimum Fish and Wildlife Resource Information requirements of the regulations.

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.21, 817.22, 817.200(c), 823; R645-301-220, -301-411.

Analysis:

Elevation is 7,630 feet on a southeast exposure and slopes of 1½ H:1V to 2H:1V. The plant community is Utah juniper and pinyon pine. Plants within this community include Salina wildrye, western wheatgrass, and Indian ricegrass.

Soils have been described in the MRP as either

- Typic Ustochrepts (50%) which are characterized by a 35 cm thick (13 inches) sandy loam surface layer with 25% coarse fragments. Underlying this layer is a stony loam layer 100 cm thick (39 inches) with up to 50% coarse fragments
- or
- Lithic Ustorthents (25%) which are characterized by rock within 50 cm or 19 inches.

Also present are small areas of Mollisols on the north and east facing slopes. In general, Mollisols are deep, well drained, with a well developed A horizon. See the General Soil Map of the Permit Area, Drawing #CE-10502-DS.

Deseret Pad and Tipple Area Soils information

Soil and Refuse sample sites are shown on Map 200-1. The following samples have been taken of the soils adjacent to the Deseret pad and represent undisturbed soil quality: SS8A, collected in 1990 and SS5 and SS10 collected in 2001. Laboratory Data Sheets for these sites are found in Appendix A. The 1990 soil samples were collected by Val Payne in April 1990 and analyzed by ACZ Laboratories in Steamboat Springs, CO. The 2001 samples were collected by

ENVIRONMENTAL RESOURCE INFORMATION

Dennis Oakley and Chuck Semborski in March 1990 and analyzed by Inter-Mountain Laboratories in Sheridan, WY.

Sample depths were not reported for the 1990 samples and profile descriptions are not available. Information from the year 2001 indicates that samples were taken from 0 – 6 inches, 6 – 12 inches and 12 – 18 inches of the surface at each sample site. No field notes were taken and it is not known whether a lithic contact was encountered at eighteen inches.

The undisturbed soils of the Deseret Pad are represented by sample sites SS5, SS8A, and SS10 as shown on Map 200-1. Qualities of the undisturbed soils are summarized in the Deseret Pad and Tipple Area Soils Information Summary table below. The Deseret pad soils in the location of SS10 were found to have much less sand (21%) than the other sites with texture bordering on clay loam (28% clay and 51% silt). As expected, this site had the highest saturation percentage.

Disturbed soils in the Deseret pad area are described by samples SS8 and SS9. The characteristics of these sites are also summarized in the Deseret Pad and Tipple Area Soils Information Summary table below.

Refuse quality is represented by sites SS6 and site 1117. Characteristics of the refuse are summarized in the Deseret Pad and Tipple Area Soils Information Summary table below. In some instances, the refuse is unsuitably high in pH, SAR, and EC. In most instances the refuse is too sandy for use in the top four feet of the reclaimed profile. Samples were taken of refuse/soil mixtures during trenching (December 3, 2001) and this combined mix may be more useful than straight refuse.

Deseret Pad and Tipple Area Soils Information Summary

	Undisturbed (sites SS5, SS8A, SS10)	Disturbed (sites SS8 and SS9)	Refuse sites (sites SS6 and 1117)
PH	7.2 – 7.6	7.0 – 7.3	7.0 – 10.0
EC			
mmhos/cm	0.32 – 0.63	0.55 – 3.0	2.1 – 13.3
SAR	0.5 – 0.6	0.81 – 1.76	8.5 – 9.1
NO ₃ – N ppm	0.3 – 1.9	0.78 – 10.3	5.1 – 6.7
P ppm	2		2.46 – 10.1
NP (t/1000t)	180 -350	314 - 421	275
AP (t/1000t)		4	1.25
Texture	sl, ls, l, cl	loam	Sandy loam
%clay			
%sand	21 - 84	35 -55	73
SP (%)	27 - 34	31 - 35	26

ENVIRONMENTAL RESOURCE INFORMATION

	Undisturbed (sites SS5, SS8A, SS10)	Disturbed (sites SS8 and SS9)	Refuse sites (sites SS6 and 1117)
Coarse frag %	25 - 40	19 - 43	29 - 34%

Bathroom pad soils information

Bathroom pad soils are represented by sample sites SS2, SS4, #19, and #22 all taken in 2001. Site #19 is also known as DBD 3600, a composite taken from 0 – 18 inches, and site #22 is also known as DBD 3700, a composite taken from 0 – 5 feet. Undisturbed soils in the vicinity of the bathroom pad are represented by SS1, collected in 2000, and SS6A, collected in 1990. Laboratory Data Sheets for these sites are found in Appendix A. The 1990 soil sample was collected by Val Payne in 1990 and analyzed by ACZ Laboratories in Steamboat Springs, CO. The 2001 samples were collected by Dennis Oakley and Chuck Semborski and analyzed by Inter-Mountain Laboratories in Sheridan, WY.

Qualities of the pad soils and adjacent, undisturbed soils are summarized in the Bathroom Pad Soils Information Summary table below. The most significant difference between the pad soils and undisturbed sites was the SAR, percent coarse fragments, and the neutralization potential. Soils in the vicinity of site #20 or DBD3700 with high SAR can be avoided as a source of substitute topsoil.

Bathroom Pad Soils Information Summary

	Undisturbed (sites SS1 and SS6A)	Disturbed (sites SS2, SS4, #19 and #20)
PH	7.2 – 7.4	7.0 – 7.4
EC		
mmhos/cm	0.71 – 3.1	0.96 – 2.4
SAR	0.3 – 0.96	0.47 – 11.7
NO ₃ – N ppm	0.8 – 7.84	0.74 – 4.8
P ppm	2 – 3.28	1 – 2.48
NP (t/1000t)	277 -308	4.5 – 662
AP (t/1000t)	0 – 5.31	0 – 1.56
TOC	(2.6%OM) 2.9 –3.6	1.5 – 5.9
Texture	SL	L - SL
%clay	9 – 16	12 – 20
%sand	54 - 63	40 - 64
SP (%)	27 - 30	23 - 29
Coarse frag %	29	24 - 40

ENVIRONMENTAL RESOURCE INFORMATION

Main access road soils information

Cut slope soils along the main access road are presented by samples SS3 (a 2001 sample) and SS5A (a 1990 sample). The qualities of the soil are shown in the table below entitled Main Access Road Soils.

Main Access Road Soils Information Summary

	Cut slope (sites SS3 and SS5A)
PH	6.8 – 7.3
EC	0.67 – 2.17
mmhos/cm	
SAR	0.22 – 2.17
NO ₃ – N ppm	0.1 – 1.4
P ppm	0.38 - 2
NP (t/1000t)	155
AP (t/1000t)	0 – 5.62
TOC	(4.1%OM)
	2.3
Texture	SL to L
%clay	14 – 16
%sand	46 - 57
SP (%)	29 - 30
Coarse frag %	14.8 – 34.5

The January 15, 2001 Technical Analysis resulted in the following deficiency:

R645-301-122, Please provide to the Division a copy of the soil survey report for the Des Bee Dove Mine site by Dr. A. R. Southard, as referenced in the submittal.

A soil survey of the Des Bee Dove mine site by Dr. A. R. Southard, Soil Scientist, Utah State University was included as Appendix B of Appendix XIV Phase 1 Reclamation.

Findings:

The information provided meets the requirement of Environmental Resources Soils section of the Regulations.

LAND-USE RESOURCE INFORMATION

Analysis:

The postmining land use for the mine site will be the same as the premining land use and that is wildlife and livestock grazing. The East Mountain allotment of the Ferron Ranger District is approximately 21,000 acres and supplies about 2500 animal unit months of grazing. Twice a year local ranchers use the Church Mine Trail (a portion of the mine access road) to drive cattle to and from the East Mountain grazing area.

Currently, the Church Mine Trail is used to reenact the migration of white settlers to the Huntington area. Eight hundred to a thousand youth per year are involved in this trek (phone call with Montell Seely, August 8, 2002). In 1959, Montell Seely took a bulldozer, 2 tons of dynamite, a jackhammer and a compressor to the top of East Mountain to widen and improve the Church Mine Trail. This information must be included in the MRP.

Findings:

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

R645-301-410, Please add a description of the use of the Church Mine Trail by locals to reenact the settlement of Huntington.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Affected Area Boundary Maps

Currently, the mine area disturbed drainage leaves the disturbed area and permit area below the Tipple Valley Fill and then re-enters the permit area and the disturbed area for treatment in the sediment pond. In a letter dated August 29, 2001 to the Permittee the Division allowed the Permittee to not permit this drainage.

Findings:

The information provided in the application meets the minimum Maps, Plans, and Cross Sections of Resource Information requirements of the regulations.

OPERATION PLAN

OPERATION PLAN

AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR 784.26, 817.95; R645-301-244, 301-420.

Analysis:

State air quality regulations at R307-205-5 Mining Activities requires mining activities to control fugitive dust by watering, paving, restricting speed, restricting travel, or by other methods. The applicant states that they will meet the requirements of the Clean Air Act. The permit states that dust will be controlled by reducing the rate of vehicle travel to 10 mph and watering on an as needed basis.

Findings:

The information provided in the application meets the minimum Air Pollution Control Plan requirements of the regulations.

TOPSOIL AND SUBSOIL

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

Analysis:

Removal and Storage

The January 15, 2001 Technical Analysis resulted in the following deficiencies:

R645-301-233 and R645-301-121.100, Incorporate the response to AM01C (NOV 01-7-1-1 Abatement information) into the submittal and supply the soils information gathered (field notes and laboratory analysis as well as consultants analysis of the information) from the abatement plan into the submittal. Utilize this information to provide information on volumes of waste, volumes of potential substitute topsoil, locations of substitute topsoil, designated mine waste burial locations, designated topsoil placement locations, and depth of topsoil placement.

R645-301-121.200, Please explain the statement made on page 12 Section 240 that growth media segregated during the valley fill excavation project will be used as the final fill cover (section 240 Reclamation Plan, page 12). Because there was no growth material salvaged during the valley fill excavation project (see NOV 01-7-1-1) the meaning of this statement is unclear.

Because there was no growth material salvaged during the valley fill excavation project (see NOV 01-7-1-1), the statement on page 12, Section 240 was removed.

Trenching at various locations on the site (as required to abate NOV 01-7-1-1) has provided the Permittee with information on the depth to bedrock, rock content and available soils material in the pad fills at the site. Trenching information was gathered during the week of December 3, 2001 and is presented in Appendices A and C of Appendix XIV Phase 1 Reclamation Plan. During the last technical review of Phase 2 reclamation, the Permittee was asked to supply information on the volumes of potential substitute topsoil, locations of substitute topsoil, designated topsoil placement locations, and depth of topsoil placement.

The Deseret Mine, Tipple and Bathhouse cover about 8.4 acres, not including the reconstructed drainages. To cover the 8.4 acres with six inches of substitute topsoil will require 6,900 cubic yards (Table 4 of Section 200 Soils). Sources of substitute topsoil are outlined in Table 5 Substitute Topsoil Excavation and shown on Drawing #200-1. In total, 20,500 cu yds of substitute topsoil may result from the sources identified in Table 5. These sources are:

- 1) Substitute topsoil transferred from Phase 1 (500 cu yds);
- 2) Bathhouse outslope (8,700 cu yds);
- 3) Bathhouse trenches (8,400 cu yds);
- 4) Undisturbed island within the disturbed area (2,900 cu yds).

Five hundred cubic yards of substitute topsoil was transferred from the Phase 1 area to Phase 2. This material is identified with a sign and stored on the Deseret pad as shown on Drawing 200-1.

Drawing 200-1 shows a 50 foot wide band along the length of the bathhouse pad as a source of substitute topsoil. This swath is expected to yield 8,700 cu yds from 1.02 acres, which calculates to a salvage depth of 5.5 feet from the 50 wide band. The band, as shown on Drawing 200-1 encompasses about 20 feet of the outslope and the remainder is from the pad surface, overlapping two proposed excavations. Table 5 indicates that the two excavations in the Bathhouse pad may yield 8,400 cubic yards of soil. This estimate may be overstated by about 500 cubic yards due to the overlap.

The quality of the material within the proposed excavations is illustrated by the laboratory analyses for trenches T6, T7A, T8, T8A, see Appendix C, Chapter 2 of Appendix XIV Phase 1 of the MRP. The surface 2-3 feet of soil on the bathhouse pad outslope is the best available material in the permit area. Below this depth, the bathhouse pad material was rated only marginal by the soils consultant due to its high carbonate content, SAR, and EC. Although marginal as a surface soil, this material may be a good source of clean fill.

Using only the surface soil from the bathhouse pad as substitute topsoil, approximately 5,000 cu yds could be salvaged and stored, based upon a swath that is 900 ft x 50 ft x 3 ft deep. The Division will require that this material is separately salvaged and stored from the other

OPERATION PLAN

subsurface colluvial material to be excavated from the bathhouse pad.

A third area proposed for substitute topsoil salvage is the undisturbed "island" below the access road and west of the bathhouse pad, represented by soil sample site SS5 (see Appendix XIV Drawing #CM-10336-DS and Appendix XIV Appendix A, Soils Analysis 2001). Disturbing 0.89 acres of this ground may yield approximately 2,900 cu yards of material, assuming half of the material is useful as soil. This calculates to three additional inches to the entire 8.4 acre disturbed area. The Division hesitates to approve disturbance of this "island" for topsoil cover and would recommend that this area be utilized only after all other sources are exhausted. For instance, a similar amount of topsoil may be gained from increasing the reach of substitute topsoil salvage in the vicinity of the southern portion of the bathhouse pad (post-SMCRA disturbance), represented by sample sites SS1 and SS2 and Trench T6. These soils were rated as the best available in the permit area by the soils consultant.

The submittal indicates on page 14, Section 200 that the excavated topsoil will be segregated and stored separately from spoil material, in a location to be chosen by the contractor as the reclamation progresses. Division recognizes the need for flexibility in handling materials, and will not require a description of topsoil storage because prompt redistribution of substitute topsoil is expected (R645-301-234.100).

Such flexibility was permitted during Phase 1 Reclamation. However, the Division was surprised to learn that the substitute topsoil, so carefully handled during Phase I reclamation, was pushed over a 100 foot cliff to its resting place shown on Drawing 200-1. The Division would not have approved of this method of moving the soil, had it been discussed. Therefore, an overall concept of how the 20,500 cu yds of substitute topsoil will be handled is requested prior to commencing Phase 2 reclamation.

Given the approximate nature of the substitute topsoil projections and the necessity of providing adequate cover for the coal mine waste, the Division will require that the Permittee keep a weekly written accounting of the volume of substitute topsoil separated and stored; the volume of waste buried; and the volume of topsoil redistributed.

The Permittee should instruct the contractor to handle soils only when they are in a loose or friable condition or when the moisture content is an optimal 10 – 15%. Generally, two rules apply: 1) If the soil sticks to the equipment, wait until the soil has dried to a friable state. 2) If the soil is too dry and hard to handle, resembling flour, add water until the soil is wetted to a loose, friable condition.

Findings:

Information provided in the proposed amendment is not considered adequate to meet the requirements of Operations Plan Topsoil and Subsoil section of the regulations. Prior to approval, the Permittee must provide the following in accordance with:

R645-201-232.200, (1) The submittal must describe separate handling (removal & storage) of the surface three feet of bathhouse outslope soils. (2) The submittal must indicate the Permittee's intention to utilize the undisturbed "island" south of the Tipple yard for substitute topsoil as a last resort after other alternatives have been exhausted and after consulting with the Division and obtaining the Division's concurrence. (3) The Permittee must evaluate increasing the area of substitute topsoil salvage from the southern portion of the bathhouse outslope.

R645-301-242.100, The Division recognizes the need for flexibility between the submittal and field work, therefore, the submittal must include a commitment that Permittee will keep a weekly written accounting of the volume of substitute topsoil separated and stored; and the volume of topsoil redistributed at the site. The weekly accounting must be available on site for review by DOGM staff.

R645-301-242.120, -242.130, The Permittee should include in Section 500 Table 1, Procedural Steps of Reclamation Timetable instruction for the contractor to handle soils only when they are in a loose or friable condition or when the moisture content is an optimal 10 – 15%. Generally, two rules apply: a) If the soil sticks to the equipment, wait until the soil has dried to a friable state. b) If the soil is too dry and hard to handle, resembling flour, add water until the soil is wetted to a loose, friable condition.

VEGETATION

Regulatory Reference: R645-301-330, -301-331, -301-332.

Analysis:

Fill slopes were vegetated with an interim seed mixture in 1981 through 1988. Given the arid climate, the vegetative cover on most of these fill sites was very good after 13 to 20 years of plant establishment. Slopes on these fills are considered very steep and are comparable to the slopes to be reestablished in reclamation. The active rooting zone of the fill material should be suitable as a growth medium in reclamation.

Findings:

Information provided in the application meets the minimum requirements of this section.

SPOIL AND WASTE MATERIALS

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

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Analysis:

Coal Mine Waste

Clean up of all coal waste is the second reclamation step described by Table 2, page 11 of Section 500, Engineering. The Division assumes that this process will be ongoing as the reclamation of the Deseret pad and the Tipple yard proceeds and pockets of waste and less desirable material are unearthed.

During a discussion held at the Energy West offices on December 18, 2001 between Division personnel (Priscilla Burton, Pete Hess, Dana Dean, Susan White, Pam Grubaugh Littig and Jim Smith); Brian McClelland, Geologist with the U.S. Forest Service; and Energy West Mining Co representatives (Dennis Oakley and Chuck Semborski), Division personnel inquired as to the following:

- Recalculation of the volume of refuse to be moved and buried as a result of the trenching operation.
- Calculation of the volume of material to be excavated from the bathhouse pad to be used as cover or fill.

The query was included in the first technical review of Phase 2 reclamation, dated January 15, 2002, wherein the Permittee was asked to provide information on the volumes of waste, designated waste burial locations and to provide a statement that all coal mine waste would be covered with four feet of non acid/non toxic material. The deficiencies were written as follows:

R645-301-553.252, Provide a statement that all coal mine waste will be covered with four feet of non acid/ non toxic material.

R645-301-731.311, Identify burial locations of all acid/toxic forming materials.

R645-301-542.730, Provide the calculated volume of the waste to be backfilled and buried in the fill as well as the volume of fill required to cover the waste (R645-301-553.252 and 553.300).

In response to the first deficiency, the Permittee has stated in the cover letter, dated April 29, 1992 and attached to this application, that underground development waste and coal processing waste does not exist at this mine site. The Permittee further states that coal spills at the site are pre-SMCRA.

The Division does not agree with this assessment. First, Drawing 200-1 shows a Valley Coal Waste Disposal Pile that is 400 feet long x 150 feet wide on the bathhouse pad. Second, this site has more area covered with coal spills, than area available as a source of clean cover.

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Coal spills fall into the category of coal processing waste as a product of physical processing and preparation of the coal. The coal spills are required by general regulation, R645-301-542.730, to be placed in a controlled manner. Reclamation plans have more specific requirements: coal processing waste must be disposed of according to R645-301-553.260 which refers to R645-301-553.252 which requires that the coal mine waste will be covered with a minimum of four feet of the best available, nontoxic and noncombustible material. Regulation R645-301-553.510 clarifies that continuously mined areas subject to AOC provisions will comply with the requirements of R645-301-553.260. Lesser cover may be allowed if the Permittee can show that lesser cover will be adequate to prevent erosion and provide adequate soil stability.

In addition, the Division is required by R645-301-553.300 to ensure that combustible materials produced during mining will be adequately covered with nontoxic and noncombustible materials and to minimize adverse effects on plant growth.

In response to the second deficiency written under R645-301-731.311, the application indicates that areas of minor coal spills will be removed and buried in the cuts of the access road and portal pads and in the two trenches to be excavated from the bathhouse pad (Reclamation Plan, Engineering Section 542.730). The volume of the two trenches is 8,400 cu yds. The submittal indicates in Section 731.300 that material with a high carbon content excavated during the backfill and grading process will also be buried in the trenches and/or used to develop pad slopes. The submittal indicates in Sections 240 and 553.100 that excess yardage will be hauled from the Deseret pad and Tipple pads to the Bathhouse pad or to the waste rock site for disposal.

In response to the third deficiency written under R645-301-542.730, the application indicates there will be a net cut from the Deseret and Tipple pads of approximately 91,382 cu yds (Section 553.100). This will be partially offset by the requirement for 64,600 cu yds of net fill at the bathhouse pad. There is a requirement for 58,000 cu yds of fill in the main drainage between cross section 3 + 00 and 8 + 00 (based on the cross-sections of Drawing 500-4). The application does not clearly indicate the source of the fill in the drainage, but the Division assumes from the figures that the source of fill will be from the Tipple yard. Mr. Oakley confirmed this assumption during a conversation with Priscilla Burton on August 13, 2002. Mr. Oakley indicated that spoil and coal mine waste from the Tipple area would be pushed down to fill the low spot in the drainage, compacted, and covered with clean fill from the side slopes.

Potential sources of cover for the coal mine waste include the soil/coal mixture found in trench T4A, native soil beneath the access road to the tipple area in trench T5 and fill beneath the main access road in trench T10, and the Bathhouse pad (see Appendix C of Appendix XIV Phase 1 of the MRP).

A clean fill depth of 3.5 feet plus six inches of topsoil will provide adequate cover after the pocking procedure (described in Section 350, Performance Standards) to ensure that combustible materials produced during mining will be adequately covered with nontoxic and noncombustible materials and to minimize adverse effects on plant growth (R645-301-553.300).

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To ensure this depth of cover, the Division requests that the reclamation plan describes a method to measure the depth of clean fill over all coal processing waste and underground development waste.

Findings:

Information provided in the proposed amendment is not adequate to meet the Spoil and Waste Materials requirements of the Regulations. Prior to approval, the following must be provided, in accordance with:

R645-301-553.260, -553.252, The application must include a commitment to cover coal processing waste with four feet of clean fill and indicate a method by which the depth of clean fill will be monitored over coal processing waste (coal spills) and underground development waste during grading.

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POSTMINING LAND USES

Regulatory Reference: 30 CFR 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Analysis:

The landowner for Phase 1 of the reclamation is PacifiCorp, the Permittee. Because the landowner and applicant are the same no requirements for landowner concurrence is required. The landowner for Phase 2 is PacifiCorp and Forest Service. The Forest Service is involved in the reclamation plan and the Division looks for their concurrence prior to approval of the reclamation.

A cattle trail will be established from the county road to access the grazing allotments on East Mountain. The trail will follow the reclaimed haul road to the pre-law waterline and then back to the reclaimed mine access road.

Findings:

The information provided meets the minimum regulatory requirements of this section. However the Division will obtain Forest Service concurrence prior to approval of this amendment.

PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES

Regulatory Reference: 30 CFR 817.97; R645-301-333, -301-342, -301-358.

Analysis:

Golden eagle nest #952 is within the half-mile buffer zone suggested by the U. S. Fish and Wildlife Service (USFWS). Restricted dates are January 1 to August 31, although these dates vary according to region. The Permittee has not proposed a start date for the work at the mine. If the project is started inside the restricted dates, after on site activities have been idled then the Division will consult with the USFWS and DWR to insure compliance with the Bald Eagle Protection Act. If the eagles are nesting then construction can begin but a biologist will need to monitor the nest. If the eagles appear to be disrupted because of the construction activity then all reclamation work will need to stop until the young have fledged. Abandonment of a nest with eggs or chicks is a violation of the Migratory Bird Treaty Act and the Utah Coal Mining Rules.

Findings:

The information provided in the application does not meet the minimum Protection of Fish and Wildlife and Related Environmental Resource requirements of the regulations. Prior to approval the following information must be provided in accordance with:

R645-301-358, The Operator must commit to the restrictions concerning the eagle protection as stated above.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

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

Analysis:

The deficiency aired by this reviewer in the January 15, 2002 Division document was stated as follows:

“The information provided does not meet the minimum regulatory requirements of this section.

R645-301-542.600 and -553.110, Prior to a recommendation for approval, the permittee must clarify what maximum slope gradients will be utilized in the reclamation of the main access and ancillary access roads. The permittee must also commit to conducting and verifying the compaction of the backfill materials to at least 90% of the maximum laboratory density as determined by ASTM D 1557-91.”

The permittee has responded in the May 2, 2002 submittal in the following manner; as committed to in the revised reclamation plan (as submitted on May 2, 2002), the permittee will reclaim all slopes in the following manner; “**Overall reconstructed slopes** will be placed on a 2H:1V or flatter configuration (refer to Map 500-4).”

An analysis of the cross sections depicted on Map 500-4 was conducted. Each evaluated cross-section will be discussed relative to the adequacy of its design specifications and the relevance of meeting the requirements of the R645 coal rules.

Cross Section -1+44.99

This cross section only contains a minor fill area that will be constructed to reclaim that portion of the primary access road that exists within that section. According to *Appendix B* (as submitted 05/02/2002), 323 cubic yards of fill will be required to reclaim this road section to AOC requirements. Analysis of the cross section on Map 500-4 indicates that the reclaimed

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“fill” slope will achieve a final slope configuration of 5.33H:1V. The minimum 2H:1V “or flatter” requirement has been met.

Cross Section -1+00

Cross section -1+00 consists of two reconstructed slopes, the first being the reclaimed access road fill area. Approximately 2700 yards of fill will be required to reclaim the road in this area, as well as a small fill at the head of the second reconstructed slope area. The final slope configuration depicted for the reclaimed access road is 3.33 H:1V.

The second reconstructed slope area exists at the southern end of what is usually referred to as the bathhouse pad. A cut of approximately 350 cubic yards will be made at the toe of this reconstructed slope to achieve a final surface configuration of 2.75 H:1V.

Cross Section 0+00

Cross Section 0+00 contains three areas where reclamation efforts will take place. One area is the channel bottom that will not receive further discussion. The second area to receive reclamation activities will again be a section through the bathhouse pad on the west side of the disturbed area. It will utilize both a cut at the head of the outslope and a fill at the base of this pad to achieve a final surface configuration of 2.15H:1V. Mass balance calculations included as *Appendix B* indicate that the cut will entail 600 cubic yards; the fill in section 0+00 will utilize approximately 4200 cubic yards. The access road portion of 0+00 will be reclaimed to a final slope configuration of 3.75H:1V.

Cross Section 1+00

Cross Section 1+00 will involve three reclamation areas, one of which will require work in the channel bottom. Similar to the previous two cross sections, reclamation work will also occur on the bathhouse pad, and in a section of access road.

The bathhouse pad reclamation work will utilize a cut at the head of the outslope, and a fill at the base of this cutbank to achieve a final surface configuration of 2.02H:1V.

The reclamation of the access road in Cross Section 1+00 will utilize but a small portion of the 3781 cubic yards of fill anticipated here. A final slope configuration of 2.3H:1V will be achieved at the access road reclamation.

Cross Section 2+00

Cross Section 2+00 utilizes three fill areas and two cuts to reclaim three areas within the section. This section will utilize a cut 25 feet in depth to establish the proper longitudinal gradient for the reclamation channel at this section.

The area of the bathhouse pad to be reclaimed within Section 2+00 will incorporate both a cut and a fill to reclaim the area to a final surface configuration having a slope of 3.5H:1V.

The reclamation channel in this section will require a cut approximately twenty-five feet in depth to establish the proper channel gradient here. A small fill is required on the East slope to make the final surface configuration aesthetically pleasing. The toe of this fill will be twenty-eight feet above the channel bottom, so that the potential for stream flow to erode the fill material will be minimal.

Section 2+00 also contains a section of the primary access road that will be reclaimed utilizing a fill. The final surface configuration of the slope will achieve a 2.8H:1V gradient.

Cross Section 3+00

This cross section will also utilize three areas in its reclamation, the bathhouse pad, the reclamation channel, and the access road reclamation. These reclamation areas will be discussed going from West to East.

The bathhouse pad will be reclaimed utilizing a cut at the head of the outslope, with a fill making up the remainder of this reclamation. The final surface configuration will achieve a 3.37H:1V gradient.

The reclamation channel will utilize a fill with a maximum depth of approximately thirty feet to establish the proper gradient for channel flow. It will be necessary to armor this area to provide adequate protection for the design event.

The access road reclamation will utilize a small amount of fill to reclaim the area to a 2H:1V gradient.

Cross Section 4+00

This section will also utilize reclamation in three areas. The bathhouse pad area will use a small cut at the head of the outslope; the remainder of the reclamation here will utilize fill. A final surface slope configuration of 2.85H:1V will be achieved.

The reclamation channel in Cross Section 4+00 will be constructed on fill having a forty-foot depth. Once again, adequate armoring will be necessary to prevent any flows up to the 100 year six hour design event volume from impacting the reclamation channel.

The road section in Cross Section 4+00 will be reclaimed by cutting down the head of the outslope and filling the base of the cut bank. A final surface configuration of 2.73H:1V will be achieved on the reclaimed slope.

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Cross Section 5+00

Cross Section 5+00 has only two major reclamation areas; the access road in this section will be reclaimed with the East slope of the reclamation channel.

The bathhouse pad area will utilize a small cut at the head of the outslope and a large fill to reclaim the cut slope and what appears to look like either a safety bench, or an ancillary road. The final slope gradient at this reclamation area will be 2.6H:1V.

The proper gradient for the reclamation channel will be established by filling the existing drainage with approximately 33 feet of material. The access road will be reclaimed by removing 28 vertical feet of material. The west slope of the re-established drainage will be configured by filling until a slope of gradient of 2H:1V is achieved. The toe of this fill will be the West bank of the reclamation channel.

Cross Section 6+00

All reclamation work in Cross Section 6+00 will occur on either the west slope or in the reclamation channel itself.

The bathhouse pad area, which sits on the upper West slope, will utilize two minor cuts and a significant fill to achieve a 2.27H:1V finished slope.

The proper slope gradient for the reclamation channel in Cross Section 6+00 will be established by adding approximately 28 feet of material to the existing channel. The center of the reclamation channel will be moved about 45 feet to the West. This will place the center of the reclamation channel on the toe of the currently existing West slope. Once again, armoring is necessary to prevent erosion of the fill from events up to and including the 100 year six hour event.

Cross Section 7+00

This cross section will reclaim two areas, the extreme north end of the bathhouse pad, and the channel bottom.

The reclamation of the bathhouse pad will be completed by filling the section until a final slope configuration of 2.36H:1V is obtained.

The proper slope gradient in the channel will be achieved by filling the existing configuration with a maximum of 15 feet of material. Armoring of the fill will be necessary to prevent erosion.

Cross Section 8+00

This cross section will utilize a cut at the head of the outslope and two fills to achieve a final surface configuration on the West slope of 2.07H:1V **in the fill areas only**. Overall, the finished surface configuration of the West slope will be established at 1.77H:1V.

A section of roadway will be reclaimed with the West slope. The reclamation process will entail making a cut halfway through the roadway width, and backfilling the remaining width at the base of the cut bank. Although the overall slope gradient on the West slope (1.77H:1V) is steeper than 2H:1V, the 1.77H:1V gradient is aesthetically more pleasing to the eye as it is very nearly collinear with the disturbed slope. The volume of fill to be utilized in the road reclamation is small; the bulk of this volume will rest directly on the road surface, and as such should remain stable even if saturated.

The reclamation channel and the reclamation of the East slope will be accomplished in the following manner:

- 1) A ten-foot cut will be made to establish the slope gradient for the channel.
- 2) A cut 136 feet in width ranging in depth from zero to nineteen feet will be made to establish the gradient of the East slope. A final configuration of 3.17H:1V will be achieved.

Cross Section 9+00

Cross Section 9+00 will utilize a cut process through 90% of the 350-foot cross-section width. The remaining 10% will use a fill approximately halfway up the West bank. **The final configuration of this fill, as depicted on drawing #500-4, and calculated to utilize 458 cubic yards of material, will be 1.88H:1V.** The overall slope gradient of the West slope, which will consist of mostly cut (84%), will achieve a final surface configuration of 1.55H:1V.

The slope on the East side of the reclamation channel will be established by removing material until a 3.7H:1V gradient is established overall. The area will be established as relatively flat adjacent to the channel, but will become concave as the slope reaches the last forty feet of its run.

The ancillary access road will be reclaimed as part of the west slope. The finished configuration of this fill is 1.88H:1V.

Cross Section 10+00

Cross Section 10+00 will also utilize a small fill on the West bank (789 cubic yards). The West slope will be filled at the toe of the Cut on the West Slope. A cut approximately 170 feet in width and about 22 feet in depth will be made to establish the correct longitudinal

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gradient for the reclamation channel. The East slope will travel on a near horizontal run until it ties into the east slope with a 25-foot convex radius. No reclamation activities will occur on the East slope above the channel bottom.

Two sections of ancillary access road will be reclaimed as part of the West slope. The lower road will be filled to achieve a final surface configuration of 2.22H:1V. A cut on the outslope between the two roads will reclaim the upper road to a final configuration of 1.25H:1V. Because this is a cut, there will be no stability concerns with this final gradient.

Cross Section 11+00

Cross Section 11+00 will utilize both minor cuts and fills to reclaim the West slope to a final surface configuration of 1.46H:1V. The reclamation slope will nearly parallel the existing slope, with minimal redisturbance. Material stability should not present a problem. This West slope will reclaim the ancillary access road by filling it to a final configuration of 2.8H:1V.

A large cut will be made to establish the proper longitudinal slope gradient in the reclamation channel bottom. To blend this cut in, it will be extended up the East slope a horizontal distance of 115 feet. A vertical rise of about 55 feet will establish a final slope gradient at 2.1H:1V.

Cross Sections 12+00, 13+00, 14+00 and 15+00

These cross sections will not be analyzed as all depict large cuts in the head of the channel. As cuts will be made in these sections to provide part of the fill for other areas, the stability of material relative to gravitational failure will not be a problem.

Regulatory Reference: R645-301-542.600. Roads

Pages 18 and 19 of APPENDIX XVI, Phase 2 Area Reclamation Plan, section 500, Engineering discusses the proposed reclamation requirements committed to for the **Main Access Road Reclamation** and the **Ancillary Access Road Reclamation**. A deficiency aired in the Division's January 15, 2002 document required the permittee to clarify the maximum slope gradients to be utilized in the reclamation of the main access and ancillary access roads. The permittee has committed to constructing the reclamation areas associated with the roads to a 2H:1V gradient "or flatter". An analysis of the cross sections depicted on drawing #500-4 confirms that all road reclamation activities will be accomplished to a 2H:1V or flatter slope configuration. This commitment adequately addresses the deficiency aired in the Division's January 15, 2002 document.

Other text stated on these pages is adequate to indicate that it is the permittee's intent to immediately reclaim the access roads as reclamation work is completed and the site is retreated. Cross Section 9+00 is the only area that will reclaim a road at a gradient steeper than 2H:1V. The amount of material to be used here is small; therefore, if a rotational failure did occur, it

would have to travel approximately seventy feet down slope to impact the channel flow. It is felt that the permittee's commitment is adequate to address the requirements of -542.600.

The Division's January 15, 2002 document also required the permittee to commit to conducting and verifying the compaction of the backfill materials to at least 90% of the maximum laboratory density as determined by ASTM D 1557-91. Adequate compaction is crucial in meeting the requirements necessary to ensure a minimum long-term static safety factor of 1.3, as required under R645-301-553.130. As noted in the permittee's 05/02/2002 response, previous experience gained during the Phase 1 reclamation of the Des-Bee-Dove Mine has shown that adequate compaction of the backfill can be achieved by making a minimum of four passes over the material using a rubber tired dozer or sheep's foot. Appendix XIV Phase 1 Reclamation R645-301-500, Engineering Section: Appendix C, contains the Rollins, Gunnell, and Brown slope stability analysis that was developed for the reclamation of the Des-Bee-Dove Mine. Conclusions determined via the RG&B report have determined that adequate compaction of back-placed fill can be achieved by making four passes of a D-9 or equivalent dozer. This is in reference to fills utilizing lift thickness not exceeding three feet with a material gradation of +4" to 8".

The deficiency aired in the Division's January 15, 2002 document specifically requests that the permittee commit to meeting a compaction requirement determined by ASTM testing method ASTM D 1557-91. As indicated by the RG&B report, this method is only utilized where lift thickness not exceeding one foot of minus 4" to 8" granular material has been used. The permittee's May 2, 2002 submittal does not address material gradation anywhere within that submittal. Therefore, it is assumed that the permittee intends to utilize three-foot lift thickness in all areas requiring rock fills. Fills meeting the criteria shown on Page 2 of the RG&B report will achieve internal angles of friction equal to or greater than 45 degrees.

Regulatory Reference: R645-301-553.110. Approximate Original Contour

As noted above, the permittee's commitment to reclaim the access roads to a finished slope gradient of 2H:1V "or flatter" is crucial to help meet the requirements relative to a post mining slope achieving a minimum long term static safety factor of 1.3. The stability of the reclamation takes precedent over the meeting of requirements to achieve approximate original contour, which is essentially established as meeting or not meeting the requirements by aesthetic or "pleasing to the eye" justification. The reestablishment of stable drainages is part of meeting the requirements of AOC. The analysis of the various cross sections performed above has revealed that very nearly all of the reconstructed slopes will achieve 2H:1V or flatter gradients **where fill material has been utilized to establish an overall slope configuration.** The cross sections depicted on drawing #500-4 show that approximate original contour is being achieved because the areas where slope reconstruction has been necessary very nearly follow the slope as it existed during mining activities. There are no pre-mining surface topographic maps or aerial photographs available as initial construction activities at this site occurred prior to the development of modern mapping technology. Where large cuts have been made, the justification to do so has come from the need to either establish the proper longitudinal channel gradient or a

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need to provide clean fill material for other areas of the site. The requirements necessary to adequately meet approximate original contour have been met.

Findings:

The permittee has adequately responded to the deficiencies relative to **R645-301-542.600** and **-553.110**. The information provided meets the minimum regulatory requirements of this section.

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.

Analysis:

General

During a discussion held at the Energy West offices on December 18, 2001 between Division personnel (Priscilla Burton, Pete Hess, Dana Dean, Susan White, Pam Grubaugh Littig and Jim Smith); Brian McClelland, Geologist with the U.S. Forest Service; and Energy West Mining Co representatives (Dennis Oakley and Chuck Semborski), Division personnel inquired after the fill sources that would be used to fill the drainage in the re-mined section of the "valley fill." Mr. Semborski suggested fill sources such as the abutment at cross-section 1+00 and material under the access road at the location of the last trench.

In the first Technical Analysis of this submittal, dated January 15, 2002, the Division requested the following:

R645-310-535, Determine the total volume of fill required to raise the level of the main drainage in the "Valley Fill" location and show sources of fill in Appendix C in Section R645-500 and on the cross-sections of Sheet 500-1 and 500-3 and 500-4.

The Permittee has indicated in the cover letter (dated April 29, 2002 and attached to the submittal) that there would be approximately 47,000 cu yds of fill required to establish the grade of the lower section of the main drainage. The sources of the fill as suggested during the December 18, 2001 meeting were not confirmed by this submittal, but during a conversation with Dennis Oakley on August 13, 2002, the Division learned that the Permittee's intention is to push refuse down the drainage and compact it beneath fill from the cut slopes above the drainage.

Also during the December 18, 2001 meeting, Division personnel inquired as to the location of slopes that would be steeper than 2h:1v, as these steeper slopes will not receive topsoil treatments.

And the following deficiency was written:

R645-301-542, Drawing 500-2 and the cross sections on Drawing 500-4 should be labeled to designate what fill areas are to be rock fill and what are to be earth fill. Slope gradients should also be depicted for the specific reclamation areas.

This submittal indicates that all **fill slopes** will be graded to 2h:1v. **Slopes formed by cuts may be steeper.** Areas of topsoil placement are shown on Drawing 200-2. The Division has noted that there are cut slopes at cross sections -1+00, 0+00, 1+00, 2+00, 3+00, 8+00, 9+00, 10+00 and 11+00 that are not shown on Drawing 200-2. During a conversation with Dennis Oakley on August 13, 2002, the Division learned that these areas will be cut to native soils which will be roughened and seeded without importation of substitute topsoil.

The proposed Phase 2 reclamation plan makes the commitment to reclaim the Deseret Mine portal areas and the associated access road to approximate original contour. The Des-Bee-Dove Mine meets the criteria of a "continuously mined area, (CMA)", as defined by the R645 coal rules.

The permittee has conducted a slope stability analysis for the Phase 1 area of the Des-Bee-Dove Mines that includes the portals of the Little Dove and Beehive Mines and their associated facilities. The reclamation plan for the Phase 2 area, as submitted on May 2, 2002 references the slope stability analysis conducted by Rollins, Gunnell, and Brown relevant to certain design criteria necessary in order to meet the minimum long-term static safety factor of 1.3.

The May 2 submittal provides new reclamation cross sections for the Deseret Mine portals, the bathhouse/office pad, the tipple pad, and the associated primary and ancillary access roads, as well as the reclamation channel in the lower canyon. Final surface configurations are depicted on those cross sections (drawing # 500-4).

The Division indicated in the deficiency document dated January 15, 2002 that the slope stability analysis that had been conducted for the Phase 1 area was acceptable for use for the Phase 2 area due to similarities of the in-place materials.

The RB&G study recommended maximum slope gradients for rock fill slopes versus earth fill slopes within the Phase 1 area. The RB&G study indicated that rock fills could be constructed up to as steep as 1.25H:1V. Earth fills could only be constructed up to as steep as 2H:1V. A deficiency aired in the Division's January 15, 2002 document indicated that the permittee needed to indicate which of the fill slopes depicted on drawing #500-4 were to be rock fills (maximum allowable slope of 1.25 H:1V) and which of the fill slopes were to be earth fills, (maximum allowable slope of 2H:1V). The permittee has addressed this deficiency by submitting a revised drawing #500-4 and revised text that indicates that all reconstructed slopes **will (overall) be built at a maximum gradient of 2H:1V.** Whether those slopes will be constructed of earth or rock is of no consequence, as the permittee has committed to

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reconstructing **all** slopes to a maximum gradient (overall) of 2H:1V. Thus, the previously aired deficiency is now addressed.

The January 15, 2002 document indicated that slope gradients should also be depicted for specific reclamation areas. Although this has not been performed on drawing #500-4, analysis of Cross Sections -1+44.99 through 11+00 under **APPROXIMATE ORIGINAL CONTOUR RESTORATION** indicates that all of the slopes that are to be reconstructed will generally meet a 2H:1V finished slope gradient. Any variation to the slope of same which would be steeper than 2H:1V would be of a very short distance utilizing a minimal volume of fill. Cut areas which would utilize a gradient steeper than 2H:1V would be of no concern because of the self-cementing nature of the undisturbed soils in the area.

The revised drawing #500-4 submitted on May 2, 2002 correctly delineates the disturbed areas that will be addressed by the reclamation plan in Cross Sections 0+00, 1+00, and 2+00.

Findings:

Information provided in the proposed amendment is adequate to meet the Reclamation Backfilling and Grading requirements of the 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.

Analysis:

Mining in the Des-Bee-Dove area predates SMCRA, going back to the late 19th century. Although it is not clear when the Beehive Mine was initially developed, a shaft from the Deseret Mine up to the Beehive was constructed sometime in the 1950's to transport coal from the Beehive Mine to the surface by way of the Deseret Mine. The portals associated with the Deseret Mine were temporarily sealed in 1987. In 1999 the portals were backfilled and the surface facilities removed. The planned reclamation will place additional fill and growth medium over the sealed portals. Water will not drain towards the sealed portals.

The currently approved mining and reclamation plan for the Des-Bee-Dove Mine shows Figure 1, Des-Bee-Dove Coal Mines, Typical Portal Seal, drawing # CM-10319-WB, (See Volume 2, Part 4, Appendix 1) which depicts a keyed double course concrete block seal hitched into the coal ribs and mine floor, with twenty five feet of noncombustible backfill placed and compacted out by the seal. This method was approved as part of C/015/017-98BR, as approved for incorporation into the mining and reclamation plan on September 1, 1998.

As observed on the March 19, 2001 site visit by DOGM personnel, and as can be seen from Photos #9, #10, and #11 included in Appendix A, "Pre-Reclamation Site Photos",

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noncombustible fill does exist out to the surface contour of the highwall. In order to meet the requirements of R645-301-551, Casing and Sealing of Underground Openings, and 30 CFR 75.1711-2, Sealing of Slope or Drift Openings, it was necessary for the Permittee to provide adequate verification that the eight mine openings associated with the Deseret Mine were permanently sealed. The Permittee submitted a reclamation plan for the Phase 2 area for the lower pad areas associated with the Deseret Mine portals, and the tipple and bath house facilities. That submittal, which has been designated as C/015/017-AM01-D, includes drawing # CS1660B, "Des-Bee-Dove Mines", Surface Facilities Map Highwall Survey, which shows that eight of the nine portals associated with the Deseret Mine were sealed with double block wall seals and backfilled at least twenty-five feet. The drawing also contains a note that "all seals were backfilled and constructed to MSHA regulations at least 25' inby opening". The drawing is P.E. certified by Mr. John Christensen, who is Utah registered professional engineer.

Drawing #CS1660B adequately addresses the requirements of R645-301-551 relative to the horizontal Mine openings, there is no verbiage relative to the method used by the Permittee to bar access to the Mine workings through the vertical shaft previously mentioned. There is no access to this shaft from anywhere on the surface, thus no safety hazard exists to wildlife or the general public

Findings:

The information provided in the application meets the minimum Mine Openings section of the regulations.

TOPSOIL AND SUBSOIL

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

Analysis:

During the Technical Review dated January 15, 2001, the following deficiency was written:

R645-301-233, Please provide information from the trenching activity conducted during the week of December 3, 2001 and utilize the information to present a coherent plan for substitute topsoil salvage and redistribution.

The submittal indicates on page 14, Section 200 that the excavated topsoil will be segregated and stored separately from spoil material, in a location to be chosen by the contractor as the reclamation progresses. Sources of cover material have been discussed in the Operations Topsoil/Subsoil section of this technical review. Drawing #200-2 identifies substitute topsoil placement.

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Phase II reclamation covers 22 acres (Section 310). The area of cut and fill activity is 8.4 acres as outlined in the submittal Section 553.100:

- Deseret Mine portal pad/material storage (1.1 acres)
- Bathhouse pad (2.0 acres),
- Tipple pads (3.4 acres),
- ancillary access roads (0.76 acres)
- access road from the mine site to the cattle guard (4.3 acres).
-

This leaves 10.44 acres out of the 22 acres total area that by default must fall within the reconstructed main drainage.

Drawing #200-2 shows substitute topsoil will be redistributed over 5.25 acres of reconstructed fill slopes on the bathhouse pad and in the lower main drainage and at the Deseret portal and access road to the Beehive. Another 3.16 acres of cut slope area may receive substitute topsoil depending upon the rock outcrop and "native ground" exposed.

Redistribution

Deseret Portal Area

The Deseret Portal area is approximately 1.1 acres. The Deseret Portal area will be graded utilizing in place material. Six inches of substitute topsoil will be applied to the surface and the soil will be poked to a depth of 18 inches.

Bedrock exists at a depth of about 5 feet below the surface in the pad area. Little suitable substitute topsoil exists in this area (see field report dated December 17, 2001), although the soils consultant did comment that the soil/coal mixture found in trenches T4A would be suitable substitute topsoil.

Tipple Area

The Tipple area is approximately 3.4 acres. The Tipple area will be graded utilizing in place material. Six inches of substitute topsoil will be applied to the graded surface and the soil will be poked to a depth of 18 inches.

A source of cover material exists beneath the access road to the tipple area in trench T5 and beneath the main access road in trench T10, see Appendix C of Appendix XIV Phase 1 of the MRP.

Bathhouse Pad Area

The Bathhouse Pad area is approximately 2.2 acres. The area will be filled using spoil and coal processing waste from the Deseret and Tipple pads. Six inches of substitute topsoil will be applied to the graded surface and the soil will be poked to a depth of 18 inches.

Pad access road

The pad access road is an area of 0.73 acres. The area will be filled with spoil and coal processing waste from the Deseret pad and Tipple pad. No substitute topsoil will be replaced. The cover material will come from the adjacent berm and outslope.

Main access road

The main access road to be reclaimed is 4.3 acres. The area will be filled with the adjacent berm and outslope. No substitute topsoil will be replaced.

Findings:

Information provided in the submittal meets the Reclamation Plan Topsoil and Subsoil requirements of the Regulations.

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.

Analysis:

General

The Des-Bee-Dove Mines are in a small, unnamed canyon that is tributary to Grimes Wash and part of the Cottonwood Canyon Creek drainage. Hydrologic resources of the entire East Mountain area, which includes the Cottonwood/Wilberg, Deer Creek, and Des-Bee-Dove Mines, are described in Volume 9 - Hydrologic Section.

No ground-water resources have been documented in the Des-Bee-Dove area, the strata east of the Deer Creek Canyon fault being essentially dry. There are some small springs farther down the canyon that will not be affected by this reclamation.

The pad for the Beehive and Little Dove Mines was built across three ephemeral channels at the head of the drainage. Flow from the two northernmost channels was captured on the Beehive - Little Dove pad and diverted around the Deseret and Tipple pads, through culverts and ditches, to the edge of the disturbed area and into the natural channel leading to the sedimentation pond. The undisturbed channel at the south end of the Beehive - Little Dove pad was diverted around that pad by a berm, but a ditch on the Deseret pad captured flow and carried it to the natural channel. All three of these channels were restored to approximate premining configuration during Phase 1 reclamation, and discharge will now simply flow over the ledge separating the Phase 1 and Phase 2 areas and drop directly to the Phase 2 area.

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Phase 2 reclamation will result in stable areas where water from the Phase 1 area will flow in a constructed channel through the reclaimed Tipple pad area, into the undisturbed channel, and to the sedimentation pond. Until Phase 2 is completed, any discharge will flow to the low spot left from the Tipple pad excavation. If there is enough water, it will breach the edge of that excavation and report to the sedimentation pond. The sedimentation pond was designed for total containment of runoff from not only the disturbed area but also from a large undisturbed area around the mines.

Materials used to construct the channels will be gradational from fine material at bottom to coarse at top, as shown in Drawing CS1819A (Phase 1), and on Plate 4 - 1 - sheet 2 of 5 in Volume 4. The engineered channels will be embedded into the fill. Beyond merely separating out boulders, some method will be needed on site to obtain adequately graded materials for filter and riprap. Boulders and coarse materials need to be placed so as to be stable, not just dumped.

For reclamation of the Des-Bee-Dove mine, channel and slope stability are more important than getting the fill all the way to the top of cut-slopes. Channels and filled slopes need to be designed and built so that water cannot saturate and destabilize fill materials.

Acid- and Toxic-Forming Materials

A deficiency written in the January 15, 2002 Technical Analysis read as follows:

R645-301-731.311, Incorporate the results of the trenching soil sampling conducted during the week of December 3, 2001 to ascertain the chemical qualities of the material remaining on site and to identify potential acid/toxic forming materials requiring burial.

The Permittee has indicated in the cover letter, dated April 29, 2002, accompanying this submittal that no acid/toxic materials were identified during trenching.

During a conversation with Dennis Oakley on August 13, 2002, the Division learned that the Permittee's intention is to push coal processing waste and spoil down the drainage and compact it beneath fill from the cut slopes above the drainage. The Permittee should be mindful of the requirements for cover over the waste (R645-301-553.260) and that the waste must be placed in a controlled manner to minimize adverse effects of leachate on the surface and groundwater (R645-301-746.120, -731.310, -731.311).

The waste in the Tipple yard was represented by Trenches T4, T5, T7, T9 and T10 (Appendix C of Chapter 2 of Appendix XIV of the MRP) and the remined coal fines beneath the storage yard are represented by samples #5, #8, #9, and #17 from the year 2000 Soil Sampling Program (Appendix A of Chapter 2 of Appendix XIV of the MRP).

Coal waste analyzed in the trench sampling program have SAR values around 3.5 to 4.0, and positive Acid Base Potential. The trench sampling program did not include Boron or

Selenium analysis, but the year 2000 soil sampling program did. No elevated Boron or selenium values were noted in the four samples that were provided to the Division (out of fifteen taken from the coal fines). The valley fill coal fines were 87 to 92% sand, with a Total Organic Carbon content of 76 to 84% and Total Sulfur Acid Base Potential between 26 and 49 Tons/1000 Tons.

Based on the previous sampling, the Division will not require sampling of the coal processing waste as it is backfilled in the drainage. But the Division will require that the main drainage is sampled prior to placement of the Type II filter bedding either before placement of cover or during grading of the lifts.

Discharges into an Underground Mine

Mine openings are sealed, backfilled, and will be covered with additional material during reclamation. There will be no surface drainage towards the buried portals and no discharge into underground mines.

Gravity Discharges

No gravity discharge will occur from the portals. The mines were dry, and water was imported for mine operations: rocks that overlie the coal seams contain low-permeability strata that inhibit vertical movement of ground water, and the surface is generally steep with poorly developed soils so recharge is minimal.

Portals were sealed to MSHA standards in 1987 and backfilled in 1999. The planned reclamation will place additional fill and growth medium over the sealed portals.

Water Quality Standards and Effluent Limitations

Monitoring of surface water will continue at the sedimentation pond outfall, UPDES permit UTG040022, which is the only monitoring site in the Des-Bee-Dove permit area (Section 750 – Surface Water). Monitoring will continue until removal of the monitoring site is approved by the Division (Section 731.200 – Surface Water). The Permittee commits that any discharges will be made in compliance with Utah and federal water-quality laws and regulations and with effluent limitations for coal mining promulgated by the EPA, as set forth in 40CFR Part 434 (Section 751). The current monitoring plan in Volume 9 calls for additional monitoring points immediately above and below the sedimentation pond site after the pond is removed.

A monitoring point just outside the upper disturbed area boundary could measure flow and sediment concentrations and other water-quality factors in runoff from the reclaimed areas and could be a means of demonstrating the effectiveness of the sediment control measures. But, because streamflows in this canyon are from summer thundershowers or snowmelt and generally of high-intensity and short duration, the real value of such a monitoring point in achieving this purpose is questionable.

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Diversions

All diversions and drainage control structures constructed for mine operations will be removed and the areas reclaimed. Flows will be returned to natural channels or constructed channels at the approximate locations of the original, natural channels.

Calculations for peak storm discharge and volume, needed to design the constructed channels, are in Appendix A of the Phase 1 amendment. Calculations were done using the STORM program, which is available through OSMRE's TIPS program. An SCS Upland Curve 7 - ephemeral channel - was used. The parameters and method are discussed on pages 20 to 24 and results are summarized in Table 7-1 on page 24 of the Phase 2 amendment.

Calculations for channel design, including filter and riprap sizing, were done using FlowMaster (version 5.13), which is based on Manning's equation. Parameters and calculation methodology for channel design are explained on pages 25 through 30. Channel dimensions, expected flow characteristics, and D₅₀ riprap requirements are summarized in Table 7-2 on page 29. Results of channel design by Hansen, Allen & Luce, Inc. are in Appendix A. The design work in Appendix A is not certified, but the same designs are on Drawing 500-2, which is certified by David Hansen, PE.

Channel design for Phase 2 has been done for Upper, Intermediate, and Lower Zones. Phase 2 reclamation will begin at the top and work downstream

The Upper Zone includes natural sandstone cliffs between the Beehive - Little Dove pad and the Deseret pad. This zone is approximately 120 feet long. To dissipate the energy of water dropping onto the Deseret pad, boulders and riprap will be used to cover portals, coal seams, and highwalls or faceups. Where drainage from above is not expected, available, ungraded fill will be used and compacted in lifts.

The Intermediate Zone is on rock outcrop. It is approximately 450 feet long. It will approximate the natural, pre-mining channel and involve no riprap or engineered channel design. Large boulders will generally not be placed within the channel because they can obstruct and divert flow, causing erosion of adjacent reclaimed areas. Water will flow over outcrops and energy will be dissipated as natural drop structures develop.

The Lower Zone is the longest, approximately 1,200 feet, extending from the lowest outcrop of the Intermediate Zone to the disturbed area boundary. This zone will be reclaimed through construction of a trapezoidal channel. The channel will be graded to approximate original contour (AOC) and then lined with riprap. To maintain or establish stable slopes adjacent to this channel, part of this channel will be constructed on placed and compacted fill.

The method used to determine riprap and filter gradation requirements is referred to on page 30 of the amendment. Table 7-3 contains the riprap and filter gradations determined for what the permittee considers the two most probable channel-slopes that will be constructed in the

Lower Zone, 13.1% and 32.3%. These slopes were determined from current survey and topographic information; however, it is expected that some rock outcrops will be encountered during construction that will necessitate modifications to the design, such as the small drops structures and pools shown in the "alternate riprap channel design" on Drawing 500-2.

Materials for constructing these channels are to be obtained on-site. Riprap sizes must be varied rather than uniform. The Procedural Steps of Reclamation Table in Section 540 states that sieve analysis will be done to assure riprap gradation meets design criteria.

Riprap should be angular rather than rounded: boulders that will be excavated on-site may be more rounded than is desirable and a method of breaking them into more angular material may be needed. The permittee states in the September 15 cover letter to the second Phase 1 submittal that they do not anticipate a need to crush or break boulders available on site to obtain appropriate angular material because most available boulders are the result of recent weathering and tend to be angular rather than rounded.

Drawing 500-2 shows cross-sections and profiles of various typical structures. Drawing 500-1 shows where these typical structures are to be built.

Schematic cross-sections of engineered channels on Drawing CS1819A in the Phase 1 amendment show that the soil immediately adjacent to the channels will overlap the uppermost riprap and cover the upper edge of the engineered channel to provide a transition from the constructed channel to soil and avoid a visible, hard edge. This transition will not only be visually more like existing natural channels but will promote growth of stabilizing, anchoring vegetation in the coarser material and eliminate an edge that could facilitate and concentrate erosion parallel to the channel: there is no analogous design in the Phase 2 amendment, but the Division expects similar design and construction criteria to be used at all stages of reclamation construction.

A small, undisturbed drainage at the south end of the Bathhouse pad is segregated from the disturbed drainage system by a 30-inch culvert that passes beneath the pad. Discharges from several other small undisturbed drainages flow onto the pad and become mixed with the disturbed drainage. All these small drainages will be reestablished in a similar manner: the pad will be excavated to bedrock, the channels will be recontoured, and the adjacent slopes will be blended to resemble the natural drainage above the pad. To prevent erosion, these channels will be armored where they lie on fill, but the plan does not have an engineered design or indicate the use of riprap in these channels.

Experience has shown that channels built on fill are subject to many problems, including failure, if not constructed correctly. Acknowledging that it is the permittee who has the authority to control, direct, and supervise construction of the reclamation channels, the Division would like to have a hydrologist or other Division representative present during placement of the filter and riprap. The permittee has stated, in the cover letter dated September 15, 2001, that they expect division representatives to be at the site as much as possible during construction to facilitate

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communication, and that they will make every effort to keep the division informed on progress and timing of construction.

Sediment Control Measures

Contouring, pocking, and vegetation are the methods to be used to keep sediment in place on reclaimed surfaces. Weed-free alfalfa hay will be incorporated into the soil at a rate of 2,000 lbs/acre (R645-301-341). Surfaces will be roughened by pocking or deep gouging to retain sediment and moisture and to mix the straw mulch into the upper portion of the soil. Hydroseeded areas will receive wood-fiber mulch. A soil tackifier will be applied to protect against erosion until vegetation is established (R645-301-244). Rock litter on the surface will also aid in sediment control, enhance vegetation establishment, create micro-habitats, and help provide a natural aesthetic appearance (R645-301-244). If erosion is identified during routine monitoring or monitoring after precipitation events, silt fence will be installed and, if needed, the surface will be enhanced and reseeded.

Success of the sediment control measures will be evaluated by examination in the field. There is no other method or standard proposed to directly determine the success of the sediment-control.

Sediment concentrations above background are not expected (R645-301-242.130); however, background levels for this site are not known. There are no water-quality or sediment load baseline data for this Des-Bee-Dove drainage that allow a comparison similar to the one done at Deer Creek Mine: this lack of baseline or background data will need to be accounted for in any evaluation of the effectiveness of sediment control measures. Such an evaluation may indicate that the measures are not adequate and more robust methods of sediment control are needed for this steep, dry, rocky, exposed site.

In the following discussion, "Appendix B" and "Appendix C" refer respectively to:

- Appendix B of Section R645-301-700 – Hydrology in Appendix XIV - Phase 1 Reclamation Plan; and
- Appendix C of Section R645-301-200 - Soils in Appendix XIV - Phase 1 Reclamation Plan.

Predictions of soil loss are found in Appendix B. The map in that appendix shows two of the profiles used to calculate soil loss - A31D and A32D - are in the Phase 2 area. The Applicant used RUSLE, developed by the NRCS, to estimate sediment contribution from reclaimed and undisturbed watersheds at Des-Bee-Dove, similar to what was done at the nearby Deer Creek Mine. RUSLE is not intended for calculations of soil loss from steep slopes, but provides at least a calculated estimate of the expected sediment levels as a starting point should further evaluation be needed.

Information in Appendix B is summarized below in Table TA-1. A soil-erodibility or K value of 0.206 (K_U in Table TA-1) was used in the RUSLE soil-loss calculations for all

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undisturbed areas, a value based on information for the Kenilworth Series in the Soil Survey of the Carbon – Emery Area. RUSLE calculated the soil loss (A_U in Table TA-1) to be 0.05 tons/year/acre for all undisturbed areas (there was little variation between undisturbed areas for any of the input parameters).

Using the soil-analysis data from the Des-Bee-Dove site, values of K for the disturbed areas were also calculated in RUSLE, (K_{SA} in Table TA-1); however, the soil analyses that were used as input to these calculations did not include the very-fine sand fraction now included in Exhibit B of Appendix C, so the input K and output A values in Appendix B do not account for this size-fraction.

TABLE TA-1, based on information in Appendix B					
K – RUSLE Soil Erodibility Factor					
A - RUSLE Calculated Soil Loss in tons/year/acre					
Disturbed Areas			Undisturbed Areas		
Soil Profile ID from Appendix B	K_{SA} Calculated by RUSLE Using Soil Analysis Data but with Very-fine Sand Fraction Missing	A_{SA}	K_U For All Undisturbed Areas	A_U For All Undisturbed Areas	Percent Difference Between A_{SA} and A_U
DBDA11D	0.394	0.092	0.208	0.05	+84%
DBDA21D	0.394	0.044	0.208	0.05	-12%
DBDA22D	0.361	0.03	0.208	0.05	-40%
DBDA23D	0.262	0.054	0.208	0.05	+8%
DBDA31D	0.262	0.034	0.208	0.05	-32%
DBDA32D	0.389	0.052	0.208	0.05	+4%

Disturbed soil profiles DBDA11D shows a predicted sediment losses 84% greater than the undisturbed areas, while soil loss is predicted to be much less in DBDA22D and DBDA31D. Predictions for the other three areas show soil loss might be roughly equivalent to that in the undisturbed areas. Longer slope-length and cover management appear to be important factors where predicted soil-loss is greater in disturbed areas than in undisturbed areas, support practice (surface roughening) where it is less.

The Permittee needs to do the RUSLE soil-loss calculations using the laboratory soil testing results in Exhibit B of Appendix C that include the very-fine sand fraction.

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Siltation Structures

There is a commitment on page 30 in Section 763 to retain and maintain all temporary sedimentation structures, including the berm along the access road, until completion of sequenced reclamation. Basins, traps, straw bales, etc. are proposed for sediment control during the construction phase of reclamation. When reclamation grading and construction are complete, the resulting pocked and roughened surface, littered with rocks and boulders, will assist in sediment control until vegetation becomes established.

Reclaimed areas will continue to report to the sedimentation pond (R645-301-553.100, p. 17). Removal of the sedimentation pond is not included in Phase 1 or Phase 2 reclamation, and the sedimentation pond will remain until vegetation is established and the Division approves its removal (R645-301-541, page 500-2). (Henry Austin of OSM has expressed his opinion that if the sedimentation pond is to be used for sediment control, the entire drainage between the mine-site and the pond needs to be permitted. A letter from Mary Ann Wright, dated August 29, 2001 clarifies the Division's position that there will be no requirement to permit the wash that connects the disturbed area pad to the sediment pond.)

Sedimentation Ponds

Ultimate treatment of runoff from the mine site is at the sedimentation pond. Energy West is planning on reclaiming the sedimentation pond as the final step in reclamation. Until other sediment control measures are effective in the Phase I and Phase 2 areas, total containment of all runoff in the sedimentation pond will remain the primary sediment control. Removal of the sedimentation pond is not planned at this time.

Ponds, Impoundments, Banks, Dams, and Embankments

A large hole or depression was left by the removal of coal from the Tipple pad, and although most of this hole was filled with sediment during a storm in late summer of 2001, a small depression or impoundment remains. Additional runoff and sediment will report to this low point. The Permittee does not consider this hole to be a sediment-control structure or impoundment. It is not a designed structure; it will probably fail, possibly suddenly, should there be a large storm event before reconstruction of this part of the channel is completed. Reconstruction of the channel will be from north to south, so this will be the last section of channel to be rebuilt.

Findings:

Reclamation Hydrologic Information is not adequate to meet the minimum requirements of the Coal Mining Rules. Prior to approval, the Permittee must provide the following information in accordance with:

R645-301-752, The Permittee needs to do the RUSLE soil-loss calculations using the laboratory soil testing results in Exhibit B of Appendix C that include the very-fine sand fraction.

R645-301-746.120, -731.310, -731.311, The plan must include a commitment to sample the main drainage at the location of each cross section from 3+00 through 12+00 shown on Drawing #500-3. The Permittee may choose to sample the final grade at a depth below four feet before placement of Type II filter bedding or continuously during grading of the fill. Analysis will include laboratory measurement of pH, EC, SAR, acid/base accounting, Boron, and Selenium.

REVEGETATION

Regulatory Reference: 30 CFR 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

General Requirements

A total of 22 acres will be seeded in Phase 2 reclamation. Sheet No 300-1, Proposed Reseeded Area, shows the area to be seeded. Dates of seeding will need to be shown on the as built.

The greatest revegetation concern at this site is stabilizing the very steep slopes, which are commonly 2h:1v and up to 1½h:1v. The application states that these very steep slopes will be treated with roughening, seeding and mulching. During Phase I these very steep slopes were not effectively mulched and roughened. The Division is particularly concerned with the area identified on Drawing #200-1 labeled Proposed Excavated Substitute Soil near SS5. This area, although affected by coal mining has not been disturbed. Soil excavation will leave this area at a 1¼ h:1v slope. An alternative borrow area is the southern post-law portion of the bath house pad.

The seed mixture (section R645-301-353.120) was designed to establish and provide some erosion control on these slopes. Annual reports detailing prevalent species established from interim seeding were reviewed for species seed mix selection. All species in the mixture are native and most are native to this specific area. Unfortunately, Salina wildrye, the dominant grass, is not commercially available for reclamation. The application rate is 61 seeds /ft². This rate is consistent with recommendations for the Utah area. Aggressive species were used because of the concern with soil stabilization. Aggressive species generally limit species diversity. Diversity of the native area is low and the reclaimed vegetative cover should meet the baseline diversity. Transplants will be used to aid in the visual attributes of the area during vegetation establishment. These transplants will also be important to add to the species diversity.

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The Division is concerned about the revegetation success in the area of the Tipple and Desert pads. In this area the quantity and quality of plant growth material is limiting. Revegetation literature generally accepts that transplants are more successful than seeding in arid conditions. The Tipple and Desert pads must have greater amounts of substitute topsoil applied than the current six inches or the number of transplants in this area increased to 750 per acre. Seven hundred and fifty plants per acre is one plant every 7.6 linear feet. Transplants should be watered at the time of planting. Additional (up to three) follow-up watering could be beneficial.

Seed will be broadcast using a hurricane spreader or applied using a hydroseeder contemporaneously as possible after roughening. The seed will be raked to cover the seed if using a hand spreader. Generally raking is not necessary unless the soil has crusted. Crusted soil should be raked even if hydroseeding. Covering the seed with hydromulch does not substitute for soil seed coverage.

All noxious weeds will be eradicated either chemically or physically if they become established on site (Maintenance and Monitoring (R645-301-357.320 thru R645-301-357.332)). The Weed Web at: <http://extension.usu.edu/coop/ag/crops/weedweb/index.htm> is an excellent resource for current noxious weed lists and control methods.

Timing

The application commits to seeding immediately after the soil is roughened. The exact season is unknown but likely will be through out the year. Early spring and late fall is the normal time for seeding in this area. A summer seeding maybe successful because this area is subject to summer rains. Several seeding attempts maybe necessary for successful germination and establishment. The Operator should be aware that only under limit conditions is reseeding allowed that does not restart the bond liability period.

Mulching and Other Soil Stabilizing Practices

One ton per acre weed free alfalfa hay will be incorporated into the soil during roughening. (Generally noxious weed free alfalfa hay is specified. Weed free hay will be difficult to find.) This will provide a slight organic component to the soil and may reduce crusting for seed germination. All areas will be hydromulched with tackifier and applied at the rate of 1500 lbs./acre. Care must be taken to not leave the seed in the hydromulcher for longer than 30 minutes.

Rocks, shrub and tree debris, and other organic on site materials should also be used as a top covering for the seeded surface.

Standards for Success

Vegetation success of the reclaimed Des Bee Dove mine area will be compared to the pinyon-juniper reference area established in 1980. Success will be judged on production, shrub

density and cover of the reclaimed site as compared to the reference area. The Operator commits to tree and shrub numbers similar to the reference areas life forms. As the Operator becomes more experienced in reclamation at this specific site the success standard section should be reviewed.

Findings:

Information provided in the application is not considered adequate to meet the minimum Revegetation requirement of the regulations. Prior to approval, the Permittee must provide the following in accordance with:

R645-301-340, Methods to effectively incorporate mulch, prepare a seed bed and revegetate a 1¼ h:1v slope must be described.

R645-301-353, The Tipple and Desert pads must have greater amounts of substitute topsoil applied than the current six inches or the number of transplants in this area increased to 750 per acre or other methods described to assure revegetation success.

STABILIZATION OF SURFACE AREAS

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

Analysis:

A deficiency written in the January 15, 2002 Technical Analysis reads as follows:

R645-301-244, Please utilize information from the trenching activity conducted during the week of December 3, 2001 to calculate the K-factors for soils on the surface of the slopes.

The information submitted was reviewed in this Technical Analysis under Reclamation Hydrology and a deficiency has been written.

Slopes will be graded to 1¼ h:1v to 2h:1v. All fill slopes will be graded to 2h:1v or flatter, but slopes formed by cuts may be steeper. Erosion control will be by extreme surface roughening or gouging on all slopes (Section 553.100, page 17; R645-301-350 Performance Standards, page 5) and rock placement (Section 553.110). These methods are more thoroughly discussed in the Reclamation Hydrology Sediment Control section of this Technical Analysis (a related deficiency is discussed in the Revegetation section). The roughening process can occur during topsoil placement or while incorporating organic materials (i.e. hay). Proper roughening is very important for the site stabilization and revegetation. Roughening is described in the

RECLAMATION PLAN

technique sheets in the Division's reclamation manual, The Practical Guide to Reclamation in Utah, found at:

ftp://dogm.nr.state.ut.us/PUB/MINES/Coal_Related/RecMan/Reclamation_Manual.PDF. The technique sheets are also useful to give to equipment operators to illustrate the degree of roughness required. Large boulders will be used as riprap.

Roughening on slopes steeper than 2:1 will be difficult and the pocking will likely not last very long. Because a pond will not be used to treat sediment a demonstration or discussion should be presented on how erosion will be controlled until vegetation establishment.

One ton per acre of certified weed free alfalfa hay will be incorporated into the soil when pocking. A soil tackifier will be applied according to manufacturers specifications. Fifteen hundred lbs/acre of wood fiber mulch and tackifier will be spread on the soil surface for cover and protection.

The area will be monitored annually for rills and gullies. The Permittee commits to filling and seeding any rills and gullies. The Permittee should expect some rills and gullies during the initial site establishment period that may be as long as 5 to 10 years in this arid area.

Findings:

Information provided in the proposed amendment is not adequate to meet the Reclamation Stabilization of Surface Areas. Deficiencies covering this issue have been written under the Reclamation Hydrology Sediment Control and Revegetation sections of this TA.

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.

Analysis:

Final Surface Configuration Maps

Cross sections, as submitted with the revised drawing #500-4 on May 2, 2002, are accurately depicted. As previously discussed, cross-sections 0+00, 1+00 and 2+00 were incorrect in that they showed reclamation work being conducted outside of the permittee's disturbed area. These have been corrected with the new drawing # 500-4.

Drawing #500-2, revised and submitted on May 2, 2002, depicts a "TYPICAL ROAD SECTION 9" (in reference to drawing #500-1). The revised section indicates that all reclamation work of access road area will be configured to a 2H:1V "or flatter" final configuration. This now coincides with the maximum slope gradient recommendation in the

RB&G slope stability analysis for earth fills. If the road sections are reclaimed using rock fill, the maximum slope gradient utilized will still be 2H:1V "or flatter". This meets the requirements of the R645 coal rules.

Findings:

The information provided is adequate to meet the minimum regulatory requirements for this section of the R645 coal rules as they relate to the reclamation of the Phase 2 area.

BONDING AND INSURANCE REQUIREMENTS

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

Analysis:

Determination of Bond Amount

The Des-Bee-Dove Mine site is currently bonded in the amount of \$1, 837,712.00 with the State of Utah through surety bond # 400 JN 6139. This amount was last reviewed prior to the August 2000 permit renewal, and is determined to be adequate.

Appendix XIV briefly discusses bonding on the last page included with the submittal. Included text indicates "upon completion of the reclamation project, PacifiCorp will revise the bond estimation by eliminating items related to the Beehive/Little Dove Mines. Bond reduction will not be requested until Phase 2 is complete (scheduled for the Fall of 2001)." This is adequate.

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Findings:

The information provided in the application meets the minimum Bonding and Insurance Requirements section of the regulations.