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January 15, 2002

TO: Internal File

THRU: Susan M. White, Sr. Reclamation Specialist/Biology, Team Lead *SMW*

FROM: Peter H. Hess, Sr. Reclamation Specialist/Engineering *PHH*

RE: Deseret Mine Portal Area/Bath House Pad/Lower storage Area/Access Road, PacifiCorp, Des-Bee-Dove Mine, C/015/017-01D

SUMMARY

In 1987, the portals at the Des-Bee-Dove Mine were sealed after it was determined that the production from that operation was no longer needed. The Mines were placed into temporary cessation status from 1987 until 1999. During that period, (February 26, 1997) PacifiCorp submitted a Notice of Intent to reclaim the Des-Bee-Dove Mine. In 1999, all of the portals associated with the three Mines were backfilled, and the surface facilities structures were removed.

The reclamation plan for the site was in need of revision. As the permittee was anxious to initiate reclamation, the site was divided into two segments. The Little Dove Mine and the Beehive Mine and their associated disturbed areas were separated into the Phase 1 portion; the Deseret Mine, located in the lower (Hiawatha) coal seam, the tipple pad area, the bath house pad, and the main access and ancillary access roads plus the reclamation of the lower channel area were included in the Phase 2 reclamation plan.

The following technical memo relates to the engineering requirements of the R645 coal rules and is an evaluation of the Phase 2 reclamation plan submittal.

TECHNICAL ANALYSIS

OPERATION PLAN

SPOIL AND WASTE MATERIALS

TECHNICAL MEMO

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

Analysis:

Disposal of Noncoal Mine Wastes: R645-301-542.740; -542.742.

The reclamation of the Des-Bee-Dove site will generate asphalt material that was used for road surfacing and diversion construction on access roads and storage areas. Asphalt generated during the Phase 2 reclamation will be disposed of by hauling it off the permit area to an approved landfill (See page 12, Section 553.100 BACKFILLING AND GRADING). Energy West will dispose of same at the Nielson landfill.

Findings:

The permittee has adequately addressed the requirements of R645-301-542.742 relative to the final disposal of noncoal mine waste (asphalt) within a State approved solid waste disposal area.

RECLAMATION PLAN

APPROXIMATE ORIGINAL CONTOUR RESTORATION

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

Analysis:

Deseret Mine portals

The permittee, at the request of the Division, provided information relative to the location of various high walls in a survey conducted during the spring of 1997. High walls, as they relate to underground coal extraction, are defined by regulation as areas whose purpose is to provide "entry to underground mining activities". Information included with the 1997 highwall survey included drawing # CS1660B, Des-Bee-Dove Mines, Surface Facilities Map Highwall Survey which depicts the eight portals and one vertical shaft connection associated with the Deseret Mine.

Although the highwalls are depicted as the immediate area at the opening in the coal seam on drawing # CS1660B, large contour cuts were necessary to access the selected portal areas due to the extreme steepness of the terrain. The portals designated as E, F, and G on

TECHNICAL MEMO

drawing CS1660B were developed along the access road to the upper Mines (the Little Dove and the Beehive). These cuts and this access road were made prior to the passage of SMCRA, with no consideration being given relative to the reclaim ability of the areas. Mine openings A, B, C, and D exist at the head of the lower canyon, where the coal seam was probably exposed by erosion. The two portals depicted at location "N" were developed on the bench that extends SSE from the head of the lower canyon.

Again, the portals that were developed through the creation of massive contour bank cuts were done without any consideration being made relative to the reclaim ability of them. Topsoil, as well as burden, was side cast from the edge of the area to gain access to the coal seam. Page 12 of the Phase 2 Area Reclamation Plan, Section 553.100 Backfilling and Grading indicates that the backfilling and grading process will utilize existing fill with no importation of fill required. The permittee anticipates that approximately 9,275 yards of material will be required to backfill the 1.1 acres of disturbance in the Deseret Mine portal area. Since no pre-mining surface configuration maps exist for the area, it is impossible to predict the exact volumes needed. If excess fill is generated, it will be hauled for utilization in the reclamation of the main access road, or for storage on the bathhouse pad.

Without knowledge of the pre-mining surface configuration, an engineering analysis using predicted cross sections is a "best guess" analysis. Although this is more accurate than merely looking at the site, as was done on March 19, 2001 by the various representatives of the USFS, and the UDNR/OGM, a certain amount of uncertainty still exists. This is especially true in consideration of the fact that at least one fill area at this site utilized a large volume of coal fines.

As noted above, the three main Deseret portals and vertical connection shaft exist at the head of the lower canyon where the combined flows of Drainages #2 and #3 will converge upon the cliff above them. Initial backfilling of the Deseret portals and associated highwall in the canyon head will utilize four to 6.5 foot diameter boulders which will bar access to the old works as well as serve as energy dissipaters for the upstream flows. All Mine openings and exposed coal seams will be covered, as this material will extend "30 feet laterally (from centerline, See drawing 500-2, Detail "A") beyond the limits of the upstream channel flow...and will be keyed into the underlying bedrock." The proposed reclamation plan indicates that the cliff formations between the upper pad and the Deseret portals will be "stepped" in increments not exceeding twenty-five feet in height to give the appearance of natural drop structures.

The fill material to regrade the highwall areas that are not reclaimed as part of the re-established drainages will be obtained by using a trackhoe to lift the fill from below the pad. Dozers will position and contour the fill to eliminate the associated highwalls and cuts to the greatest practical extent.

Any bank cuts that remain above the Deseret portal areas will exist due to the impossibility of trying to backfill nearly vertical areas with fine materials and have them remain

stable. This remaining highwall will be more stable in an unfilled status than it would be if attempts were made to push material to the top of the cut. The Deseret Mine portals will not pose a hazard to public health or safety, or to the environment due to the remoteness of their location (R645-301-553.530).

The restricted site configuration will control the actual extent to which fill can be placed between the drainages.

Amendment AM01D commits the permittee to limiting lift thickness to the specifications listed in the Rollins, Brown and Gunnell slope stability analysis, (rockfill lifts not greater than 30 inches in thickness; earthfill lifts shall not exceed one foot in thickness).

Amendment AM01D states that compaction will be achieved with a dozer, trackhoe bucket, or other acceptable means. The RB&G slope stability analysis recommends that rockfills should be compacted using "at least **four** passes of a D-9 or equivalent dozer". "All minus 4" to 8" granular material should be placed in lifts not exceeding one foot in thickness. The fill should be compacted to an in-place unit weight equal to at least 90% of the maximum laboratory density as determined by ASTM D 1557-91." The compaction requirements specified within the RB&G slope stability are considered to be the necessary "other acceptable means" necessary to ensure that the required long term static safety factor of 1.3 can be achieved and thus meet the minimum regulatory requirement of R645-3-1-553.530. **Thus the permittee must commit to performing the compaction requirements specified as well as the methods necessary to confirm that those requirements are being met.**

AM01D states that all prepared slopes will be placed on a 1-1/4H:1V or flatter in accordance with the RB&G Slope Stability Study.

Tipple Pad Area Reclamation

The tipple pad area consists of 3.4 acres. The permittee anticipates that 2, 722 cubic yards of fill will be required to backfill the area. Due to the fact that no premining topographic base maps exist, it is difficult to determine an accurate fill amount. Lift thickness, material gradation, compaction and finished slope gradients will all be established based upon the recommendations made within the slope stability analysis performed by Rollins, Brown and Gunnell.

Bath House Pad Area Reclamation

The bathhouse pad area consists of 2.0 acres that will require 20,435 estimated yards of fill to regrade, as determined by the permittee. As no pre-mining topographic base maps exist, it is impossible to determine an accurate amount. An ocular field survey conducted by the permittee and representatives of the UDNR/OGM as well as the USFS determined that a sufficient amount of fill existed to reclaim the various areas within the site. Lift thickness,

material gradation, compaction and finished slope gradients will all be established based upon the recommendations made within the slope stability analysis performed by Rollins, Brown and Gunnell.

Main Access Road Reclamation

This area consists of 4.0 acres of surface disturbance. Guardrail demolition must occur prior to the initiation of backfilling the road surface. The permittee does not include an estimate of the volume of fill material necessary to return the road cut to a pre-mining configuration. Lift thickness, material gradation, compaction and finished slope gradients will all be established based upon the recommendations made within the slope stability analysis performed by Rollins, Brown and Gunnell. A typical road (reclamation) section is depicted on Drawing # 500-2, Section 9. Same indicates all road reclamation will utilize a maximum slope gradient of 2:1. This conflicts with the recommendation made within the RB& G slope stability report, (i.e., 1-1/4H:1V or flatter). The words "or flatter" do not conflict, but the 2H:1V "maximum slope" depicted on Section 9 of Drawing 500-2 conflict with the 1-1/4H:1V RB & G recommendation. As 2H:1V is flatter than 1-1/4H:1V, the drawing should be revised to coincide with the RB & G recommendation.

Ancillary Access Road Reclamation

The various ancillary roads within the site comprise 0.73 acres. Guardrail demolition and culvert removal will occur as the access road is reclaimed on retreat. The backfilling of the road cut will utilize what materials can be recovered from the outslope, based upon the maximum reach of the trackhoe performing the work. Any excess fill that was generated from the reclamation of the Desert and tipple pad areas will also be used if available. Compaction will be applied as lifts are developed via the tramping back and forth of the dozers being used to position the material. Lifts will not exceed those thicknesses recommended within the RB&G Slope Stability Study. Crawler and bucket compaction are felt to be adequate for the maximum slope gradients recommended within the Rollins, Gunnell and Brown slope stability analysis. The submittal also commits the permittee to reclaiming the road to a specification having a maximum slope gradient of 1-1/4H:1V or flatter as specified within the RB&G Slope Stability Study. The area will be contoured and roughened by deep gouging to aid moisture retention and reestablishment of vegetation such that the reclamation work will model the existing surrounding topography.

The only comment which this reviewer feels should be made is that if the access road is reclaimed immediately following the reclamation of the Mines and their associated disturbed areas and problems develop with any of that work, then it will be necessary to redisturb the reclaimed road to gain machinery access. Although it may be possible to perform the necessary repair work via other acceptable means, these tend to be cost prohibitive. The permittee may want to wait a few seasons prior to reclaiming the access road to see if the main facilities reclamation areas have remained stable.

Cattle Trail Restoration

AM01D proposes to retain a cattle trail through the Des-Bee-Dove site to allow livestock access to the East Mountain area. Much of this trail will follow existing portions of established access road. Where that is the case, the road will be reclaimed to a maximum of six feet of width. Other portions of this livestock access will be established using a small dozer or other machinery that is capable of operating safely in this type of steep terrain. The trail will encompass 0.89 acres of reclamation. Primary sediment control will be performed by deep gouging; secondary control will be maintained through the retention of the existing sediment pond.

General Information Relative to All Previously Mentioned Reclamation Areas

Photograph #'s 8, 9, 10, and 11 of Appendix A of Appendix XIV (C/015/017-AM01A) show the upper limits of backfilled material in each photo relative to the Phase 1 portion (Little Dove and Beehive Mines reclamation). The photos provide verification that it is not the permittee's intent to fully backfill the highwalls, but rather to leave the upper portion unfilled. This constitutes a "remaining highwall". The protrusion of numerous sandstone members in this area prevails, and attempting to key in fill to the tops of these and have that material remain stable would be an exercise in futility. However, the reclaimed surfaces in the Phase 2 areas will meet AOC because:

- 1) The postmining topography will closely resemble the premining topography;
- 2) All spoil piles are eliminated;
- 3) All drainage channels are being restored;
- 4) The postmining land use is the same as the premining land use.

The requirements for achieving the approximate original contour requirements are included in the backfilling and grading requirements. The Division's Technical Memo 002 contains guidelines to help evaluate compliance with AOC.

The term "**Approximate Original Contour**" means that the final surface configuration achieved by the backfilling and grading of the mined areas, including any terracing or access roads, closely resembles the general surface configuration of the land prior to mining and blends into and complements the drainage pattern of the surrounding terrain. All highwalls, spoil piles, and coal refuse piles having a design approved under the R645 Rules in preparation for abandonment.

The Division does not have any specific requirements relative to how well a site blends into the surrounding terrain. The general requirements are that the slopes of the reclaimed area are of similar length and steepness of the surrounding area and that the reclaimed topography merges into the surrounding area. The Division's staff has looked at the proposed reclamation

topography and cross-sections and has determined that the reclaimed site will blend into the surrounding area.

Although highwall retention under some circumstances may provide certain environmental benefits, both Federal and State regulations require the complete elimination of all highwalls. In Utah, the rules indicate that permittees must eliminate all highwalls, except in previously or continuously mined areas and when cliffs existed in the highwall area before mining. Under the general requirements and within the meaning of the AOC directive, elimination of highwalls means backfilling, regrading and reshaping highwalls in a manner that meets AOC requirements and the requirements of the postmining land use.

All highwalls at the Des-Bee-Dove mine were developed prior to SMCRA and therefore do not have to be eliminated if the Permittee can demonstrate that 1) the highwall will be compatible with the postmining land use, 2) provide adequate drainage, 3) be stable (safety factor of 1.3), and 4) there is not enough spoil on site to completely reclaim the highwalls. The compatibility issues are discussed in the postmining land use section of the TA. The drainage issues are discussed in the hydrology section of the TA. The slopes in the area have been analyzed and determined that they meet or will meet the minimum long term static safety factor of 1.3 provided the requirements of the RG&B specifications are followed during backfilling and grading.

The prevailing reason as to why the highwalls cannot be completely eliminated is due to the restricted site configuration. The permittee can probably place enough spoil to cover the highwalls, but due to the extreme steepness of this areas canyon, it would have to be placed at an angle that would cause the slope to have a safety factor of less than 1.3. The Division's main concern in the reclamation of this site is the stability of the backfill. The remoteness of the area would not endanger the public or create any serious environmental hazards even if a major slide occurred. No purpose will be served in covering the entire cut to the top of the sandstone escarpments; doing so would actually detract from the aesthetic value of the reclaimed areas, as compared to the adjacent undisturbed lands.

The term highwall has been broadly interpreted to include cut slopes or cut features associated with highwalls, roads, pad facilities and other surface features related to underground coal mining. The permanent program rules have eliminated this broad interpretation of the term. The rules fail, however, to address what specialized grading techniques, if any, should be used to reclaim cut-slopes or roads and pads. In some cases, leaving cut-slopes or conducting other specialized grading practices may yield a superior reclamation plan when all performance standards and requirements for AOC are considered.

There are no spoil or coal refuse piles relative to this site. Hence the requirement to eliminate same is not applicable as to the requirement needing to be met relative to the achievement of approximate original contour.

Findings:

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.

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 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

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. Thus, R645-301-553.610 gives the Division authorization to not require the permittee to completely eliminate the highwalls in the area, if insufficient spoil exists on site or the safety factor requirements cannot be met.

Page 18 of the Phase 2 submittal indicates that surveys conducted during the summer of 2001 verified that sufficient backfill material was available to reclaim the Mine to meet the requirements of approximate original contour restoration. However, large volumes of coal waste were used as fill material at this site, some of which have only been recently discovered.

The permittee has submitted a slope stability analysis for the upper portals and their associated reclamation areas. The Phase 2 Reclamation Plan, as submitted on October 15, 2001 contains a study performed by Rollins, Gunnell and Brown at Profile B and longitudinal cross section 3+00, as depicted on drawing # CS1817C. The toe of Profile B intersects Profile A at cross section 3+00. Thus Profile B is for the upper pad area as it is situated between the Beehive portals and the Little Dove portals. The analysis contains two options for the backfilling of Profile B.

Reclamation cross sections have been provided for the Deseret Mine, the bath house pad, the tipple pad area, and the lower Canyon area. Fifteen cross-section locations are depicted on

drawing numbers 500-1 and 500-3. Drawing 500-2 depicts a longitudinal profile/channel gradient, as well as cross-sections for the reclamation channel design. The channel reclamation cross sections vary in width from fifteen to thirty feet.

Drawing 500-4 depicts what the permittee intends to do relative to the restoration of approximate original contour in this lower Canyon area. This area is an extremely narrow canyon, with near vertical walls on either side. These cross sections will be evaluated on an individual basis.

Cross Section 0+00

Cross section 0+00 is located at the extreme southern end of the disturbed area, as depicted on Drawing number 500-3. The cross section bisects three areas of the disturbance, those being the extreme southern end of the bathhouse pad area (215 foot width), the reclamation channel (44 foot width), and the primary access road reclamation (64 foot width).

Starting on the left side of 0+00, analysis of the bath house pad reclamation shows that the final configuration of the reclamation will be established to a slope of 1.65 H:1V. The permittee intends to reach out approximately sixty-five feet over the outslope to pull material back up to fill the base of the cut bank. This will establish a slope which is in-line with the slope gradient below the pad, and will achieve a postmining slope that does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long-term static safety factor of 1.3 and prevents slides (R645-301-553.130). This area is not considered part of a reclamation highwall, as determined by analysis of drawing number CS1660B, Des-Bee-Dove Mines Surface Facilities Map, Highwall Survey.

Where 0+00 crosses the reclamation channel, the section is the channel configuration. There will be no cut or fill required.

Analysis of the horizontal distances versus the elevation differences on the road section reveals that the road will be reclaimed to a final slope configuration of 3.2 H:1V.

There is a problem with cross sections 0+00, 1+00, and 2+00. On cross section 0+00, a reclaimed slope is depicted from -300 to -25 (west side of reclamation channel) as well as from +12.5 to +175 (east side of channel). If one compares the disturbed area perimeter depicted on map #500-1 and 500-3, these portions of reclaimed slope will be outside of the currently established disturbed area perimeter. This appears to be an error, unless it is the permittee's intent to intentionally reclaim what is necessary to be reclaimed according to the R645 coal rules.

Similarly, cross sections 1+00 and 2+00 also show reclamation slope gradients outside of the permittee's disturbed area acreage and reclamation responsibility.

Cross Section 1+00

Cross section 1+00 crosses the Des-Bee-Dove disturbed area three times; 1) the bath house pad 2) the reclamation channel, and 3) the reclaimed primary access road.

Analysis of the bath house pad area indicates that one cut and two fill areas will be required to obtain a final finished slope configuration of 1.71 H:1V. It will be necessary to obtain fill to reach this configuration in this area, as the drawing depicts that the cut will only provide about one-half the volume necessary to make the fills to reach the depicted configuration.

The reclamation channel will require some fill on the east side of the channel to reach the depicted configuration.

The reclamation of the primary access road will be achieved by pulling material up from the outslope and reconfiguring it at the base of the cut bank to achieve a final surface configuration of 2.12H:1V. This is in agreement with the previous text described on page 16 of the Phase 2 reclamation plan.

Cross Section 2+00

Cross Section 2+00 crosses in and out of the disturbed area seven times. Again, this is not depicted on the section, which depicts reclaimed slopes from -475 to +300. A shift of the cross section location slightly to the North would have avoided this in/out problem.

Analysis of the proposed reclamation slope on the bathhouse pad indicates that both a cut and fill will be performed to give a slightly concave final configuration at a 3.31H:1V gradient.

An excavation approximately 32 feet in depth will be required to reach the depicted reclamation channel configuration at cross section 2+00. Fill will be generated for use in other areas.

The reclamation of the primary access road will reach a final surface configuration of 2.2H:1V, which is better than the 2/1 or 1 ¼: 1 discussed on Page 16 of the Phase 2 plan.

Cross Section 3+00

Cross Section 3+00 is the first transect which is fully contained within the disturbed area perimeter.

The reclamation in the bathhouse pad area is depicted to achieve a final surface configuration of 3.14 H:1V. Total slope configuration of the west bank will achieve a final configuration of 2.47H:1V.

The reclamation channel will be constructed on approximately thirty feet of fill material.

The reclamation of the primary access road will achieve a finished slope gradient of 1.33H:1V. This meets the criteria established by the RB&G study of a maximum slope on the primary road of 1-1/4H:1V or flatter.

Cross Section 4+00

Cross section 4+00 is made up of three segments where reclamation will occur. These are 1) the bath house pad, 2) the reclamation channel and its associated east/west slopes, and 3) the primary access road.

Drawing 500-4 depicts a final surface slope configuration of 2H:1V. Material on the outslope will be pulled up to help achieve this shape. Fill necessary to achieve this final configuration will have to be placed by hauling and pushing.

The necessary grade for the reclamation channel at this section will be achieved by placing thirty-five feet of fill in the channel bottom. To obtain a portion of this fill, a seventy foot wide cut (horizontal width) will be made on the outslope of the primary access road. This cut will only provide a small percentage of the fill necessary to establish the proposed channel sides. The final surface shape depicted on the west slope is calculated to be 2.16H:1V. The east slope will achieve a configuration of 2.85H:1V up to the primary road portion.

The reclamation of the primary access road will fill the base of the cut-bank to achieve a 1.1H:1V. Although the 1.1/1 slope is steeper than the maximum recommended by the RB & G report, the amount of fill to be placed here is small in relationship to other areas within this section. Even if this area failed, it would not present a problem as the area is remote and the volume of material is insufficient to slide the 120 feet into the channel.

Cross Section 5+00

Cross section 5+00 includes the widest portion of the bathhouse reclamation pad, as well as the filled reclamation channel and access road.

At the bathhouse pad, a small amount of material will be pulled back up from the top of the outslope. Although not depicted on drawing 500-4, the possibility of digging an incised area within the bath house pad area to permanently dispose of coal refuse has been discussed by the permittee with the Division's input. This would also create additional fill material. The final surface configuration depicted for the bathhouse pad area on cross section 5+00 is calculated to be 2.4H:1V.

The reclamation channel will achieve its final surface configuration by accepting thirty-eight feet of fill on the slope east of the channel. The access road will receive a fairly large cut in

order to reshape the east slope to an aesthetically pleasing slope configuration. The slope from the channel edge to the outslope of the access road will achieve a final slope configuration of 4H:1V.

The primary access road in cross section 5+00 will be reclaimed by making a fifteen-foot cut at the road shoulder and backfilling the base of the cut bank to achieve a final surface configuration of 1.4H:1V.

Cross Section 6+00

Cross sections 6+00 and 7+00 are also within the bathhouse pad reclamation area, although the width of this area is diminishing. As depicted on cross section 6+00, the pad area will be reclaimed by recovering material from the crest of the outslope, and back filling the two-step cutbank. Fill will need to be hauled into the area to achieve the final surface configuration depicted (1.88 H:1V).

Section 6+00 depicts only a minor amount of surface reconfiguration to achieve the final shape of both the western and eastern slopes. About twenty-eight feet of fill will be placed to establish the proper grade for the channel's east side. The west slope will parallel the existing the surface; the east slope above the channel fill will achieve a final configuration of 1.36H:1V.

Cross Section 7+00

Cross section 7+00 will occur at the ancillary road switchback that allows access onto the bathhouse pad. A large fill will occur here to reconfigure the area to a final surface shape achieving a 1.58H:1V slope. The overall final surface slope from the head of the reclamation section down to the western edge of the reclamation channel will achieve a final surface slope of 1.72H:1V. The channel as it currently exists will receive fifteen feet of fill to establish the grade necessary to achieve the flow gradient depicted on drawing 500-2, Profile 10.

The east slope of the reclamation section above the channel will be shaped to achieve a finished slope configuration of 5.3H:1V on the lower section and 2.12H:1V on the upper slope section. Both gradients should be adequate to ensure long-term slope stability in the area.

Cross Section 8+00

The western reclamation slope of Cross Section 8+00 begins at the western edge of the disturbed area perimeter and extends down until it reaches the west bank of the reclamation channel. A cut will be made in the lower third of the slope, with fills in the upper two-thirds to reach the final surface configuration in this section of 1.74H:1V.

A ten-foot cut will be made to reach the determined channel depth necessary. This cut will be extended up the eastern slope for fifty vertical feet. The maximum depth of cut in this

area will be approximately 18 feet. Some fill will be used to reshape the base of the eastern cutbank in this area. The final surface configuration in this area will be established to 3.12H:1V.

Cross Section 9+00

Cross section 9+00 depicts a reclamation slope and a valley fill to achieve the necessary cross section to meet the correct longitudinal flow gradient. A twenty-two foot cut will have to be made to lower the channel to where it needs to be to minimize the flow velocities. Two small fills will be required on the west bank. The remaining cut will establish a final finished surface configuration of 1.76 H:1V on the western slope. The east slope above the reclamation channel will be established by making a cut approximately 125 feet long and twenty feet deep.

Cross Section 10+00

Cross section 10+00 depicts a reclaimed slope on the western side of the reclamation channel. A cut approximately 100 feet long and a maximum of thirty feet in depth will be made to establish the final surface configuration slope of 1.2H:1V. The channel bottom will be established by cutting the area to a depth of twenty feet by 175 feet in width.

Cross Section 11+00

The reclaimed slope configuration on the western bank in cross section 11+00 is nearly collinear with the existing configuration. Only minor reshaping will be necessary to reach the projected final surface slope of 1.52 H:1V.

A cut will be made in the valley floor to establish the cross section for the channel configuration and its eastern slope. This cut will be 175 feet wide and achieve a maximum depth of twenty feet deep (at the channel location).

Cross Section 12+00

Cross section 12+00 will be established by the excavation of a large cut to establish the correct elevation for the channel bottom. The channel bottom will be located one hundred feet east of the cross section center, and will be thirty feet lower than the existing surface configuration. The cut should produce a large amount of usable fill. The reshaped slopes will resemble the existing undisturbed surface slopes by achieving a final surface configuration of 1.37H:1V on the western slope and 1.97H:1V on the eastern slope.

Cross Section 13+00, 14+00 and 15+00

All three of these cross sections will utilize significant cuts in the channel bottom in order to reach the elevation necessary to establish the head of the drainage at the proposed 32% grade (See Drawing #500-2, Profile 10). Section 13+00 depicts a small cut and minor re-shaping of

the extreme east end of the disturbance to achieve the depicted final surface configuration. Section 14+00 will require a minor fill at the extreme east end of the disturbed area. The finished gradient of this fill will be 1.6H:1V.

Although the cuts necessary to establish the proper gradient in the channel bottom are somewhat deep (average cut depth approximately twenty feet), the final surface configuration of the adjacent slopes will closely resemble the existing surface configuration within the area.

Cross Section 16+00 and 16+11.96

The last two cross sections depicted on Drawing 500-4 show two minor fills on the eastern edge of the reclamation channel. The fills will be keyed into the channel bottom and constructed as depicted on Drawing 500-2, Profile 1.

The remaining section of the reclamation channel will very closely resemble that area, as it currently exists (1.2 feet of fill will be placed to establish the channel cross section at section 16+00). As the rock fills will be keyed into the channel bottom, there is nowhere for the material to slide. Section 16+00 depicts 1H:1V east and west channel side slopes.

Analysis of the cross sections depicted on Drawing 500-4 indicates that only two of the numerous reclamation slopes analyzed had final slope configurations steeper than the maximum recommended within the Rollins, Brown and Gunnell slope stability analysis (1.25H:1V). The areas that exceeded the 1.25H:1V maximum were the final surface configurations for the primary access road in Cross Section 4+00 (at 1H:1V) and the final surface configuration of the West Slope in Cross Section 10+00 (at 1.2H:1V).

The fill required in Cross section 4+00 will amount to approximately 700 cubic yards, which is a small amount. The 1.2H:1V slope in cross section 10+00 is a final cut slope configuration. The 1.2 / 1 slope does not present a stability problem because a cut must be made to achieve it.

The slope stability analysis conducted by Rollins, Gunnell and Brown contains specific design criteria that are recommended to ensure the long-term static safety factors calculated for the various backfill designs for the upper pad area. This study can be adapted to the lower Canyon area due to similarities of the materials.

RB & G recommends that, based on the analysis of the available material at hand, that rockfills can be established to slope gradients achieving a 1.25H:1V or flatter configuration. Earth fill slopes should not be greater than 2H:1V. 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 for clarification purposes. Slope gradients should also be depicted for the specific reclamation areas. Cuts to final surface configuration need not be addressed.

All drawings are P.E. certified by Mr. David Hansen, who is a Utah registered professional engineer.

Cross sections 0+00, 1+00, and 2+00 are not correct in that they depict reclamation activities outside of the Mine sites disturbed area.

Findings:

Information provided in the application is not considered adequate to meet the minimum Backfilling and Grading requirement of the regulations. Prior to approval, the Permittee must correct the deficiencies noted above.

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 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.

On February 26, 1997, PacifiCorp filed a Notice of Intent with the Division to reclaim the Mines. 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 UDNR/OGM personnel, and as can be seen from Photos #9, #10, and #11 included in Appendix A, "Pre-Reclamation Site Photos", 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 bathhouse 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:

Information provided as part as part of the Phase 2 Reclamation Plan for the Des-Bee-Dove Mines (C/015/017-AM01D) is considered adequate to meet the requirements of this section for the Deseret Mine portal areas.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

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

Analysis:

Final surface configuration maps

Phase 2 includes several maps that show a plan view of the reclamation that the permittee intends to implement in the Deseret Mine portal area, the tipple pad area, the bath house pad area, and the main access and ancillary access roads. The Phase 2 reclamation plan includes Drawing # CS1817C, Phase 1 Reclamation Plan View and Cross Sections which depicts two drainage profiles (Drainage 3 and Drainage 2), a cross-section of the backfilled cut bank between these two channels, and four reclamation cross sections (0+00 through 3+00). The Maps section of the Phase 2 submittal contains two plan view maps designated as drawing # 500-1 (Phase 2 Reclamation Channel Reclamation) and # 500-3 (Phase 2 Reclamation / Reclamation Sections Location). The two maps are identical with the exception of their respective title blocks and drawing number designations. Cross sections for the Phase 2 reclamation area are depicted on Drawing #500-4.

The reclamation cross sections depicted as 0+00, 1+00, and 2+00 on Drawing #500-4 are incorrect in that they show reclamation work being conducted outside of the disturbed area perimeter.

Drawing # 500-2 provides a typical reclamation cross-section for the main access and ancillary access road reclamation projects, (See "Typical Road Section-9/500-1"). This should be revised to coincide with the slope gradient recommended in the RB & G slope stability analysis.

Findings:

The information provided is not 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 Sec. 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 appears to be adequate.

Findings:

The information provided meets the minimum regulatory requirements of this section.

RECOMMENDATIONS:

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.

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