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# State of Utah

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

Norman H. Bangarter  
Governor

Dee C. Hansen  
Executive Director

Dianne R. Nielson, Ph.D.  
Division Director

355 West North Temple  
3 Triad Center, Suite 350  
Salt Lake City, Utah 84180-1203  
801-538-5340

TO: Daron Haddock, Permit Supervisor

FROM: Priscilla Burton, Soils Reclamation Specialist

DATE: January 2, 1992

RE: Revision of Chapter Three, "Operation and Reclamation Plan", Genwal Coal Company, Crandall Canyon Mine, ACT/015/032/91F, Folder #2, Emery County, Utah

## SUMMARY

Chapter Three has been revised several times to incorporate the numerous changes that have occurred at the mine site in the past three years and to attempt to respond to stipulations placed on amendments approved by the Division.

Throughout Chapter 3, reference is made to Chapter 8 for soil information (and vice versa). Therefore, this review is of compliance with the R614-301-200 rules (whether the information is contained in Chapter 3 or in Chapter 8). Compliance with the air quality regulations is also reviewed.

The Crandall Canyon site has a topsoil shortage for the planned reclamation depth of one foot of topsoil over the 6.65 acres (less access road width and length within the permit area).

## TECHNICAL DEFICIENCIES

<b>R614-301-100.</b>	<b>GENERAL CONTENTS</b>
<b>120.</b>	<b>Permit Application Format and Contents.</b>
<b>121.</b>	<b>The permit application will:</b>
<b>121.100</b>	<b>Contain current information, as required by R614-200, R614-300, R614-301 and R614-302.</b>

### Applicant's Proposal:

Included with this revision are replacements for Plate 3-6 (Road Profile and Cross Section), Plate 2-1 (Lease Boundary Map) and Plate 3-3 (Mining Projections),

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and Appendix 3-5 (Water Shares Diversion).

With this revision, Appendix 3-10 (Waste Storage Removal Agreement), Plate 3-7 (Proposed in-mine sump) and Plate 3-14 (Proposed Bathhouse) are deleted.

Technical Deficiencies:

The contents of Chapter 3 have not been updated to reflect current operating realities or regulations. For example, on page 3-4 the applicant claims ownership of the Wellington Preparation Plant. On page 3-22 the permitted acreage is listed as 423.9 acres, but the permitted acreage was increased to 2,165.42 acres as of 4/22/91. Pages 3-4 and 3-5 refer to Class One, Two and Three roads. These designations were replaced by the terms primary and ancillary in the April 12, 1990 regulations.

The application contains references to the UMC Regulations on several pages (Including, but not limited to pages 3-12, 3-20, 3-21, 3-24, 3-25, 3-26, 3-37, and 3-38.) The chapter is written so as to defer procedures for compliance and mitigation to the regulations. It is therefore, imperative that the regulations cited are the current operating regulations.

Plate 3-6 has not received any changes since its first edition in February of 1988. Although, the primary haulroad within the disturbed area boundary was modified, asphalted and cemented in 1991. And, the ancillary road to the portals was modified in 1990.

Plate 2-1, reflects the current lease boundary accurately and requires no further modifications to be in compliance.

Plate 3-3 (Mining Projections) does not indicate the progression or sequence of mining. Future projections for the leases presently being applied for (as indicated in the Transfer of Permit Rights document, approved 11/26/91) have not been indicated on plate 3-3. The location of the two additional monitoring wells to be drilled in January 1992 must be shown on plate 3-3.

Compliance:

The application is not in compliance. Please refer to the above discussion.

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**121.200. Be clear and concise;**

Applicant's Proposal:

The Chapter contains numerous sources of confusion and erroneous citations.

Technical Deficiencies:

Page 12-15 of Section 12.4.3 of the MRP refers the reader to Section 3.4.6.2 of the plan for proposed mitigation. No plan for mitigation was found in Section 3.4.6.2., page 3-20. Rather, the applicant states that a plan will be developed involving guzzlers when a problem arises.

Section 3.5.4.4, page 3-27 states that regraded land will be treated as described by the Division. This is not clear or concise.

An erroneous citation is listed on page 3-23. The reader is referred to Section 3.5.5, when 3.5.2 is more apt.

Plate 3-15 was referred to on page 3-5, but could not be found.

Page 3-12 there is an error in the use of the scaled distance equation.

Pages 3-8 and 3-21 should refer the reader to the Notice of Intent submitted to the Division of Air Quality September 12, 1991.

The location of the drill hole report cited on pg 3-2 should be listed with this reference to the drill hole.

The discussion of the oil storage and fuel containment area on Page 3-2 must also include a reference to the spill prevention countermeasure and control plan filed with the EPA and on file at the mine site and mine office (as per R614-301-730).

Page 3-3 refers to Plate 3-13 "Electrical substation Installation." However, the MRP already contains a Plate 3-13 which is "Proposed Screening and Load Out."

Chapter 8, Section 8-5, pg 8-4 lists the location of the chemical analysis of the coal in Appendix 5-2. This Appendix in Vol 1 contains "Cultural Resource, Determination of Effect," not a chemical analysis of the coal resource.

Chapter 8, page 8-7 states that Plate 3.8 shows the location of the topsoil piles in relation to the surface facilities. This is incorrect; Plate 3-10 shows this relationship.

Section 3.5 "Reclamation Plan" refers to Table 4 which could not be found.

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Compliance:

The application is not in compliance with this regulation. Please see the above discussion for some of the changes to be made in the text to develop a clear and concise document.

**121.300. Be filed in the format required by the Division.**

Applicant's Proposal:

During a previous chapter revision, a cross-reference from old to new regulations was submitted. This cross-reference cites Sections 13.1 and 14.1 for information concerning organization of the MRP. Reading these sections, one finds that the organization of the MRP is according to the November 1980 and the May 1987 Division Guidelines.

In the present revision of Chapter 3, Genwal has provided each revised page with a date in the bottom right hand corner. This practice is advantageous to the reader and is the Division's policy for revisions to the MRP.

Technical Deficiencies:

The cross-reference provides section and chapter locations for information on compliance with the R614 rules, which were developed in 1990. There are some corrections to be made in the cross-reference. For instance, in the R614-301-200 rules, the following corrections should be made:

RULE	ADDITION	SUBTRACTION to the CITATION
R614-301-231.100	sec 3.4.4, 8.11	
231.300	sec 3.5.4.4, sec 3.5.5 sec 8.9	sec 8.7, sec 8.8
231.400	Plate 3.8	
232.100	sec 3.5.2	
232.200	sec 3.5.2, 8.6	
232.500	sec 8.6	
243.100	sec 8.6	sec 8.8
242	sec 8.8, sec 3.5.4.4	see below
242.110	sec 3.5.4.4	
through.200	sec 3.5.4.4	
243	sec 8.9, App 8-1	sec 8.8
244.100	sec 8.8 and 8.9	
and.200	sec 8.8 and 8.9	sec 8.8.8.9

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Compliance:

The application is not in compliance. The cross-reference requires these (and perhaps other) changes to become a reliable tool for the reader.

- 122. If used in the permit application, referenced materials will either be provided to the Division by the applicant or be readily available to the Division. If provided, relevant portions of referenced published materials will be presented briefly and concisely in the application by photocopying or abstracting and with explicit citations.**

Applicant's Proposal:

The application refers to an Spill Prevention Control and Countermeasure Plan. The application refers to an outdated Air Quality Approval Order.

Technical Deficiencies:

The applicant must include in an appendix, the spill prevention control and countermeasure plan.

Likewise, the most current air quality control information must be provided, i.e. the Notice of Intent (from 1991) or the subsequent Air Quality Approval Order.

Any pertinent agreements with the U.S. Forest Service concerning the parking/turnaround, the Forest Service Road, additional parking permitted adjacent to the topsoil stockpiles, etc. must be included in the permit application package.

Compliance

The application is not in compliance with this regulation. Please see the above discussion.

- 123. Applications for permits; permit changes; permit renewals; or transfers, sales or assignments of permit rights will contain the notarized signature of a responsible official of the applicant, that the information contained in the application is true and correct to the best of the official's information and belief.**

Applicant's Proposal:

The application was submitted by J. Marshall, Chief Engineer for the applicant.

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Technical Deficiencies:

No statement as to the veracity of the information submitted was supplied. Mr. Marshall's signature was not notarized.

Compliance:

The application is not in compliance.

**R614-301-200.**

**SOILS**

**230.**

**Operation Plan.**

**231.**

**General Requirements. Each permit application will include a:**

**231.100.**

**Description of the methods for removing and storing topsoil, subsoil, and other materials;**

Applicant's Proposal:

The cross-reference refers the reader to sec 8.7 for information. In this submittal of Chapter 3, "Preservation of the Soil Resource" is described in Section 3.4.4. Section 3.4.4.2 of Chapter 3 refers the reader to Section 8.11 for information concerning "Control Measures to Mitigate Impacts."

Section 3.5.2, page 3-22, "Reclamation Plan/Soil Removal and Storage," describes activities which have occurred as part of operations (not reclamation).

The reader learns in the section entitled, "Protection of Vegetation Resources," that topsoil was removed from the surface with a front end loader and D-6 dozer in a single lift. The depth of removal was based on color, using the soil survey attached as App 8-1 for a guide. Soil was removed from areas on Plate 8.1 identified as TCE (Twin Creek Soil), and JDE (Jodero and Datino variants).

Technical Deficiencies:

The location of the information is not clearly stated. The reader is referred to chap 8, then chap 3, then back to Chapter 8 again for information. Information on the soil resource is actually found in the section entitled "Reclamation Plan/Soil Removal."

Since topsoil removal has occurred, the date of topsoil removal should be indicated.

Compliance:

The application requires clarification of detail.

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**231.200. Demonstration of the suitability of topsoil substitutes or supplements;**

Applicant's Proposal:

Section 8.6 states that the "B" horizons from the JDE and TCE soils will be salvaged and used to make up any topsoil deficiency. The analysis of these subsoils is located in Appendix 8.1, a technical report written by Mr. Laural H. Stott of Valley Engineering Inc., Richfield, Utah, June 1981.

Technical Deficiencies:

As shown in Appendix 8-1, representative samples from the JDE soil were pedon #1 from the Datino variant and pedon #2 from the Jodero variant: loamy-skeletal and coarse-loamy (respectively), mixed Cumulic Haploborolls.

The profiles had no "B" horizons. The Jodero variant contained a very deep "A" horizon, from 28 to 36 inches, a "C1" from 32 to 50 inches, and a "C2" from 50 to 65 inches deep. The Datino variant had an "A" horizon from 7-10 inches deep, and "C1" through "C3" from 8 to 60 inches deep. Rock fragments in the Datino variant ranged from 35 to 50% in the "A" horizon and 25 to 50% in the "C" horizon.

The representative sampling from pedon #3 of the TCE (Twin Creek) soil was a fine-loamy, mixed, Typic Haploboroll with a "B" horizon from 8-22 inches. Percentages of rock fragments in the A horizon (20 - 35%) decreased in the B horizon to 15 - 35 percent. The C1ca horizon from 22-51 inches was subdivided for sampling from 22-36 and 36-51 inches. Indicating that the "C" horizon subsoil may have been evaluated for substitute topsoil potential.

All horizons from all profiles sampled had low electrical conductivities, low SAR values and were rich in organic matter content. The limitation for use of the "B" and "C" horizons from the JDE and TCE soils was the quantity of rock fragments.

Page 10 of Appendix 8-1 itemized topsoil and subsoil depths. Subsoil collection probably followed these depths. In the JDE map unit, the Jodero variant topsoil was 32 inches deep and subsoil was 65 inches deep; the Datino variant topsoil was 8 inches and the subsoil was 37 inches deep. In the TCE map unit, the topsoil was 8 inches and the subsoil 57 inches deep.

It is not clear whether topsoil and subsoil salvage followed these recommended depths. Chapter 8 indicates that color was used to determine the depth of salvage.

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Compliance:

The applicant did demonstrate the suitability of subsoil for use as a topsoil substitute, but the application does not identify the depth of subsoil salvaged.

**231.300. Testing plan for evaluating the results of topsoil handling and reclamation procedures related to revegetation; and**

Applicant's Proposal:

Page 10 of Appendix 8-1 provides nutrient supplement recommendations for the topsoil and subsoil after sampling in June of 1981, prior to long-term storage.

Sampling of the topsoil storage piles prior to soil redistribution is addressed in Section 3.5.5.1 "Soil Preparation," page 3-28 of the plan. On page 3-29, the applicant states that soil test data and recommended amendments will be submitted to the USFS prior to soil redistribution.

Technical Deficiencies:

In Section 3.5.5.1, the method of sampling is detailed. Two samples each will be taken from the top, middle and lower thirds of the piles. Samples will be pulled using an auger. The sample will be mixed and a subsample will be sent to the lab for determination of nutrients. The parameters to be analyzed for are not indicated. The application must indicate that nitrate nitrogen, and total nitrogen, available phosphorus, available potassium will be analyzed for as well as pH and electrical conductivity. Furthermore, the application must state that the soils analyses will be submitted to the Division; and, that the Division will be consulted concerning laboratory recommendations for soil amendments prior to their use.

Compliance:

The parameters to be analyzed for must be listed in the plan. The application must state that the Division will be provided with the results of the soil tests and accompanying recommendations, prior to their implementation.

**231.400. Narrative that describes the construction, modification, use and maintenance of topsoil handling and storage areas.**

Applicant's Proposal:

Plate 3-10 shows the location of the three topsoil piles with reference to the

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location of surface facilities. Plate 3-8 provides contours, cross sections, area, yardage for each topsoil pile.

Section 8.7 refers the reader to Section 3.2.1 of the application. Section 3.2.1. refers the reader back to Chapter 8 for topsoil stripping details.

Page 8-8 of Section 8-7 provides estimates of the volume of soil to be salvaged. It was estimated that there was 5,171 cubic yards of topsoil and 3,239 cubic yards of subsoil to be collected for a total of 8,410 cubic yards of soil stockpiled.

Page 8-3 of Section 8.3.2 discusses the total salvage of 8,410 cubic yards of topsoil and subsoil. Included in this analysis are the volumes of stockpiles #1 and #2 = 2,020 cu yds and the projected salvage 6,380 cu yds of topsoil and subsoil to be placed (apparently) in stockpile #3.

Plate 3-8 shows the actual stockpiles containing  $943 + 1087 + 1671 = 3,701$  cubic yards of stored material.

Section 8-7, pgs 8-7 and 8-8 describe earthen berms and fences that will be constructed around the topsoil piles. Section 3.2.1 describes the use of earthen berms, straw bails, silt fences or the equivalent.

#### Technical Deficiencies:

The application should refer the reader to Chapter 8, Section 8.7. In this section, the separate removal of topsoil and subsoil is described, using color to determine the depth of removal. Section 8.7 further describes topsoil removal to the depth specified in App 8-1, except for the steep slopes of soil type DPH2 (2.39 acres of Doney and Podo variants and rock outcrop on 50 to 70% slopes). Loss of recoverable topsoil from these steep slopes will be made up with subsoil from the JDE and TCE soil units (pgs 8-6 and 8-8). Plate 8-1 (Soil Types) and plate 3-1 (Surface Facilities) are cited for further information.

Topsoil is stored in three locations on the Forest Service access road. Which of these piles is the "substitute topsoil" is not designated on Plate 3-8. (The narrative on page 8-8 implies that subsoil is stored adjacent to the stockpile # 2. But, the narrative on pg 8-3 Section 8.3.2 implies that stockpile #3 will contain subsoil and topsoil.) Section 8-7, pg 8-8 also indicates that topsoil and subsoil is stored adjacent to the public parking area on the USFS road.

Plate 3-8 does not provide an original surface line for cross-section "J" stockpile #3. The original surfaces for storage piles #1 and #2 were not surveyed. They are approximated on Plate 3-8. The method of determining volumes must therefore be indicated.

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An accounting of the difference in the estimated volume to be stockpiled and the actual volume stockpiled must be provided. i.e. approximately 5,000 cu yards less material was stockpiled than was anticipated.

Page 8-6 of the narrative indicates that there is temporary storage of topsoil above the substation pad and across from the coal stockpile and above the #2 stockpile. Soil stored in these locations is designated for final reclamation of areas above the substation pad and across from the coal stockpile.

Presently, the three stockpiles within the disturbed area are protected by an asphalt berm, and strawbales. There are no fences and no earthen berms.

Compliance:

Topsoil and subsoil depths were reported on page 10 of App 8-1, however it is not clear from Section 8.7 if these depths were used for subsoil and topsoil salvage. The plan must state with certainty the depth to which topsoil was salvaged.

Plate 3-8 requires reworking. The method of determining volume salvaged of topsoil and subsoil must be stated, since the original surface of the pile locations was not surveyed. An accounting of the limited recovery of topsoil and subsoil must be provided in sec 8.3.2, page 8-3 and sec 8.7, pg 8-8, see above discussion.

The separate storage of topsoil and subsoil is described in the MRP. Plate 3.8 must be reworked to indicate which storage piles are subsoil and which are topsoil and to indicate the volumes of topsoil and subsoil. Adjacent to topsoil stockpile #2 on Plate 3-8 there is an area that is labeled "future topsoil stockpile." This area was previously permitted by the Forest Service as a gravel storage area and is (apparently) currently permitted by the Forest Service as a parking area (pg 3-6, Section 3.2.10). Plate 3-8 must correctly state the use of this area and provide supporting documents from the FS allowing activity outside of the disturbed area boundary.

Reference to subsoil and topsoil storage adjacent to the public parking area of the FS road must be clarified (p8-8, Section 8.7).

The protection of topsoil stockpiles with an asphalt berm and strawbales must be described on pg 8-7 and 8-8 rather than the earthen berms and fence which is presently described.

Reference to temporary storage piles no longer in existence can be removed from the MRP. The plan should indicate the location of topsoil stored in areas which have been contemporaneously reclaimed.

Details of final reclamation, such as the total area reclaimed, depth of topsoil

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redistribution, fertilizer concentrations applied, method of ripping, method of seeding, mulching etc. must be written in the "Final Reclamation" section of the MRP for future reference.

- 232. Topsoil and Subsoil Removal.**  
**232.100. All topsoil will be removed as a separate layer from the area to be disturbed, and segregated.**

Applicant's Proposal:

Section 3.5.2, page 3-23, Section 8.7, page 8-5, and Plate 3-8 address this rule.

Technical Deficiencies:

The commitment to segregate topsoil from subsoil is expressed in Section 3.5.2 and Section 8.7, but the location of the substitute topsoil piles is not indicated on Plate 3-8.

Compliance:

The location of the subsoil which is substitute topsoil must be indicated on Plate 3-8 and in the narrative.

- 232.200. Where the topsoil is of insufficient quantity or poor quality for sustaining vegetation, the materials approved by the Division in accordance with R614-301-233.100 will be removed as a separate layer from the area to be disturbed, and segregated.**

Applicant's Proposal:

Section 3.5.2 page 3-23 indicates that subsoil will be used to make up the topsoil shortage. Pages 3-6 and 3-22 indicate that 6.65 acres have been disturbed at the mine site.

Page 8-8 and page 8-3 of Chapter 8 indicate that there will be one foot of topsoil or topsoil substitute replaced over a disturbed area of 5.15 acres, requiring a total of 8,410 cu yards of stockpiled soil.

A contingency plan for topsoil deficiency is stated on page 8-6 of Section 8-7 in Chapter 8. Here, the applicant suggests that the stream buffer zone (outside of the disturbed area) will be flattened "to handle excess excavation." The plan calls for "design adjustments in pad elevation" to provide a balance in cut and fill measurements.

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Technical Deficiencies:

This section should refer the reader to Sections 8.6 and 8.7 for further details.

The plan is inadequate in describing the area of disturbance requiring topsoil replacement and in addressing the volume of topsoil required for reclamation of the 6.65 acres disturbed. The amount of topsoil in the stockpiles is itemized in Plate 3-8 at 3,701 cubic yards of material. Chapter 8 commits to the replacement of one foot of soil material over the entire site (page 8-8). The Division calculates that for the 6.65 acre site, this will require 10,728 cu yds of stockpiled soil. That amount may be slightly reduced by the area to remain as an access road. The applicant has a serious shortage of topsoil, the stockpiles account for only one-third of the amount calculated to be required.

The contingency plan, as described in sec 8-7 Chapter 8, is not approvable at this time.

Compliance:

The location of the storage of the substitute topsoil must be indicated on Plate 3-8.

The volume of stockpiled topsoil material, the acreage of disturbance to be reclaimed and the shortage of topsoil must be clearly outlined and stated in Chapter 3 and Chapter 8.

Additionally, the applicant must further elucidate the contingency plan for topsoil deficiency discussed on page 8-6 of Chapter 8. This plan is not approvable as it is presented.

**232.600. Timing. All material to be removed under R614-301-232 will be removed after the vegetative cover that would interfere with its salvage is cleared from the area to be disturbed, but before any drilling, blasting, mining, or other surface disturbance takes place.**

Applicant's Proposal:

As stated on pg 3-23 of Section 3.5.2 and on pg 8-7 of Section 8-7.

Compliance:

The applicant is in compliance with this section.

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- 232.700.** Topsoil and subsoil removal under adverse conditions. An exception to the requirements of R614-301-232 to remove topsoil or subsoils in a separate layer from an area to be disturbed by surface operations may be granted by the Division where the operator can demonstrate;
- 232.710.** The removal of soils in a separate layer from the area by the use of conventional machines would be unsafe or impractical because of the slope or other condition of the terrain or because of the rockiness or limited depth of the soils; and

Applicant's Proposal:

The applicant states that there will be no soil harvested from 2.39 acres in the soil type shown on Plate 8-1 as DPH2, due to excessive slope and shallow soils (page 8-6 of Section 8-7).

Compliance:

The applicant is in compliance with this regulation. Topsoil was not harvested from 2.39 acres (see discussion under R614-301-231.100).

- 233.** Topsoil Substitutes and Supplements.
- 233.100.** Selected overburden materials may be substituted for, or used as a supplement to topsoil if the operator demonstrates to the Division that the resulting soil medium is equal to, or more suitable for sustaining vegetation on nonprime farmland areas than the existing topsoil, has a greater productive capacity than that which existed prior to mining for prime farmland reconstruction, and results in a soil medium that is the best available in the permit area to support revegetation.

Applicant's Proposal:

Please see the discussion under R614-301-231.200.

Compliance:

The applicant is in compliance with this regulation.

- 233.200.** The suitability of topsoil substitutes and supplements will be determined on the basis of analysis of the thickness of soil horizons, total depth, texture, percent coarse fragments, pH, and areal extent

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**of the different kinds of soils. The Division may require other chemical and physical analyses, field-site trials, or greenhouse tests if determined to be necessary or desirable to demonstrate the suitability of topsoil substitutes or supplements.**

Applicant's Proposal:

Please see Appendix 8-1, Soils Study of the Crandall Canyon Permit Area by Laural H. Stott of Valley Engineering of Richfield Utah, conducted in June of 1981.

Compliance:

The applicant is in compliance with this regulation. See also the discussion under R614-301-231.200.

- 234. Topsoil Storage.**
- 234.100. Materials removed under R614-301-232.100, R614-301-232.200, and R614-301-232.300 will be segregated and stockpiled when it is impractical to redistribute such materials promptly on regraded areas.**
- 234.200. Stockpiled materials will:**
- 234.210. Be selectively placed on a stable site within the permit area;**
- 234.220. Be protected from contaminants and unnecessary compaction that would interfere with revegetation;**

Applicant's Proposal:

See Sections 8.6 and 8.7 and Plate 3.8 describing the placement of 3 stockpiles along the forest service road. The stockpiles are protected with an asphalt berm and strawbales. The applicant commits to protecting the soil resource from contaminants and unnecessary compaction.

Compliance:

The Mining and Reclamation Plan requires updating in Chapter 8.

- 234.230. Be protected from wind and water erosion through prompt establishment and maintenance of an effective, quick growing vegetative cover or through other measures approved by the Division; and**

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Applicant's Proposal:

The application cites one seed mix in Section 3.5.5.2 (pg 3-29) and another on pgs 3-22 and 3-30 (Appendix 3-15) as being used on the topsoil piles for protection and cover of the soil resource.

Technical Deficiencies:

The application is confusing. Which seed mix was used on the stockpiles?

Compliance:

Clarify the discrepancy in the information provided in Section 3.5.5.2 (pg 3-29) and that referred to on pgs 3-22 and 3-30.

**234.240. Not be moved until required for redistribution unless approved by the Division.**

Applicant's Proposal:

A commitment to this effect is lacking in the plan.

Compliance:

The applicant must commit to maintain the stockpiles in their present configuration until required for redistribution.

**234.300. Where long-term disturbed areas will result from facilities and preparation plants and where stockpiling of materials removed under R614-301-232.100 would be detrimental to the quality or quantity of those materials, the Division may approve the temporary distribution of the soil materials so removed to an approved site within the permit area to enhance the current use of that site until needed for later reclamation, provided that:**

**234.310. Such action will not permanently diminish the capability of the topsoil of the host site; and**

**234.320. The material will be retained in a condition more suitable for redistribution than if stockpiled.**

Applicant's Proposal:

It is not clear whether the applicant's final, contemporaneous reclamation of the

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slope above the substation pad and the bench beside the coal loadout fits into this category of temporary topsoil storage.

Technical Deficiencies:

On Plate 3-1, recently revegetated areas are not distinctly separate from disturbed areas. They should be identified as areas of contemporaneous reclamation within the undisturbed area. If areas of contemporaneous reclamation are to be redisturbed during final reclamation, then this must be stated in the plan. And, arrangements for removal of topsoil and subsoil which is stored on the contemporaneously reclaimed slopes must be made.

While evaluating this possibility, the Division has noted that Plate 7-5 requires redrawing. The disturbed and undisturbed area boundaries in this map do not match those of Plates 3-1, 3-4 or 3-5.

Compliance:

The application must specify areas that have been permanently reclaimed and will not be disturbed during final reclamation. Likewise any areas that have been reclaimed, but will be re-disturbed during final reclamation must also be designated on Plates 3-1, 3-5, and 3-4. The additional available topsoil resource that may be stored 'in situ' must be calculated and added into the mass balance calculations. A revision of Plate 7-5 is also necessary to accurately reflect the undisturbed area and contemporaneous as well as final reclamation areas that report to the sedimentation pond.

- 240. Reclamation Plan.
- 241. General Requirements. Each permit application will include plans for redistribution of soils, use of soil nutrients and amendments and stabilization of soils.
- 242. Soil Redistribution.
- 242.100. Topsoil materials removed under R614-301-232.100, R614-301-232.200, and R614-301-232.300 and stored under R614-301-234 will be redistributed in a manner that:
- 242.110. Achieves an approximately uniform, stable thickness consistent with the approved postmining land use, contours, and surface-water drainage systems;
- 242.120. Prevents excess compaction of the materials; and
- 242.130. Protects the materials from wind and water erosion before and after seeding and planting.
- 242.200. Before redistribution of the materials removed under R614-301-232 the regraded land will be treated if necessary to reduce potential slippage of the redistributed material and to promote root

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**penetration. If no harm will be caused to the redistributed material and reestablished vegetation, such treatment may be conducted after such material is replaced.**

Applicant's Proposal:

Section 8.8 of Chapter 8 refers the reader to Section 3.5.4.4, "Soil Redistribution and Stabilization /Reclamation Plan," for a discussion of a monitoring system to ensure proper replacement depth. A responsible party will monitor the activity to ensure an even redistribution.

As described in sec 3.5.4.4, a front end loader and/or a D-6 dozer will be used to spread topsoil. As described on pg 8-9, sec 8-8, disturbed areas will be stacked (sic) prior to replacement of one foot of topsoil over the 5.15 acre disturbed area.

Section 3.5.4.4 states that prior to topsoil redistribution, the land will be treated as required by the Division. On page 3-27 of the same section, the application states that regraded land will be disced where there is less than 30% slope and ripped in other areas until it becomes impractical.

Section 8.8, pg 8-9 indicates that the land will be disced or harrowed after topsoil replacement.

Technical Deficiencies:

The plan should state simply and clearly that after returning the grade to approximate original contour, the earth will be ripped eighteen to twenty-four inches deep. The areas of topsoil replacement will be staked for quick, visual depth determinations. The topsoil will be applied using a track vehicle and a road grader.

For slopes less than 30%, the fertilizer will be broadcast over the surface. No discing will occur after topsoil redistribution, except for the purpose of crimping in the mulch (please see additional discussion under R614-301-244.200).

For slopes greater than 30%, fertilizer will be broadcast onto the regraded land, prior to topsoil redistribution. Topsoil will be applied. The slopes will be hydroseeded and hydromulched.

The Division would also consider acceptable the practice of applying broadcast fertilizer to the ripped subsoil prior to laying down the topsoil on slopes less than 30%, enabling the operator to perform the same fertilization operation on the entire reclamation site, regardless of slope. (Please see additional discussion of this topic under R614-301-244.200.)

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Compliance:

The application requires rewording prior to being in compliance with Division requests.

- 243. Soil Nutrients and Amendments. Nutrients and soil amendments will be applied to the initially redistributed material when necessary to establish the vegetative cover.**

Applicant's Proposal:

This topic is addressed in Section 3.5.5.1 "Soil Preparation," page 3-28 and 3-29 of the plan. And, in Section 8-9 of Chapter 8, where the broadcast method of fertilizing is chosen for use.

Technical Deficiencies:

The Division must be consulted and provided with the results of the analyses. Please see additional comments concerning analyses under R614-301-231.300.

Section 8-9 states that broadcasting of fertilizers will not be done between the months of October and April, but that the soil will be redistributed in early October. This presents a conflict, since fertilization and seeding must be concurrent with topsoil redistribution. Since, the amount of fertilizer to be applied for a native grass/shrub community will not create elevated nitrate levels in nearby streams, there should be no problem following topsoil replacement with fertilization if it is incorporated into the soil. Additionally, topsoil replacement and seeding should occur in early September. This is the beginning of the wet cycle for the site as shown by the past years of precipitation data collected at the site (see annual reports).

Compliance:

Consult with the Division concerning the results of soil sampling and fertilizer recommendations prior to their use. Apply fertilizers at the time of soil redistribution. Redistribute soils early in the Fall (early September). Follow soil redistribution immediately with seeding (late September to early October) to take advantage of fall moisture.

**244. Soil Stabilization.**

- 244.100. All exposed surface areas will be protected and stabilized to effectively control erosion and air pollution attendant to erosion.**

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Applicant's Proposal:

Section 3.5.5.3 "Final Reclamation," describes grading on a contour to minimize erosion and instability. A commitment to protect the soil from erosion is found in Section 8.8.

Technical Deficiencies:

The Division recommends and stresses that the surface must be left rough. One pass over the topsoil for discing in fertilizer is sufficient. A smooth surface will not collect water as efficiently and will be subject to erosion from water and wind.

Compliance:

The document must state that the soil surface will be left rough (not smooth) after discing in fertilizer, prior to seeding. Please see additional discussion below under R614-301-244.200.

- 244.200. Suitable mulch and other soil stabilizing practices will be used on all areas that have been regraded and covered by topsoil or topsoil substitutes. The Division may waive this requirement if seasonal, soil, or slope factors result in a condition where mulch and other soil stabilizing practices are not necessary to control erosion and to promptly establish an effective vegetative cover.**

Applicant's Proposal:

Section 3.5.5.3 "Final Reclamation," page 3-31 describes 1.5 tons per acre of straw mulch on slopes of 30% or less, which will be anchored through the use of a notched disc. One ton/acre of wood fiber hydromulch will be applied with tackifier for slopes greater than 30%.

The contemporaneous reclamation of steep slopes will receive curlex instead of hydromulch as per page 3-30 of Section 3.5.5.2 "Seeding and Transplanting."

Technical Deficiencies:

The Division anticipates that these mulch levels will be sufficient. However, using a notched disc over the topsoil to crimp in the mulch will needlessly destroy soil structure and aggregation and subject it to erosion. If a notched disc is to be used for crimping, the chronology should be as follows: rip subsoil, spread topsoil, broadcast fertilize, seed, mulch and then crimp in the mulch with a notched disc. The result will be an irregular surface with some seed and fertilizer granules buried deeper than the rest. (A built in

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reservoir of seed for future years.) This method will also reduce travel over the redistributed topsoil and result in savings in manhours and fuel.

Compliance:

The application must ensure that after topsoil redistribution, the surface will be left rough, that crimping in mulch will be done in a manner that does not smooth nor compact the surface.

- 244.300. Rills and gullies, which form in areas that have been regraded and topsoiled and which either:
- 244.310. Disrupt the approved postmining land use or the reestablishment of the vegetative cover, or
- 244.320. Cause or contribute to a violation of water quality standards for receiving streams will be filled, regraded, or otherwise stabilized; topsoil will be replaced; and the areas will be reseeded or replanted.

Applicant's Proposal:

The commitment to reseed and regrade any gullies greater than six inches is found in Section 8.8 of Chapter 8.

Compliance:

The applicant is in compliance with this regulation.

- 420. Air Quality.
- 421. Coal mining and reclamation operations will be conducted in compliance with the requirements of the Clean Air Act (42 U.S.C. Sec. 7401 et seq.) and any other applicable Utah or federal statutes and regulations containing air quality standards.
- 422. The application will contain a description of coordination and compliance efforts which have been undertaken by the applicant with the Utah Bureau of Air Quality.

Applicant's Proposal:

Section 3.4.7 refers the reader to the "Air Pollution Control Plan" included in Chapter 11 as Appendix 11-2.

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Technical Deficiencies:

The air quality approval order found in Appendix 11-2 is outdated. It is from August 6, 1985. The latest approval order from DAQ is dated 9/21/88. Presently, Crandall Canyon mine has a Notice of Intent under review at the Department of Environmental Quality. This Notice must be included in the MRP as an appendix to Chapter 11. When the Notice is approved and the Department issues a new Air Quality Approval Order, it must also be added to the documentation in the Appendix of Chapter 11.

Compliance:

In Section 3.4.7 and in Chapter 11, state the latest Approval Order date and that a Notice of Intent is being reviewed by the Department of Environmental Quality. Include both documents in the appendix to Chapter 11.

## CONCLUSIONS

Several critical pieces of information are missing from the reclamation plan. For instance, topsoil mass balance calculations are not accurate; areas of contemporaneous reclamation are not located on Plates 3-1, 3-4, 3-5 and 3-7; the salvage of soil from contemporaneous reclamation areas is not addressed.

Chapter 3 requires further editing and revision to adequately address the R614-301-200 and 420 regulations.

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