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

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August 18, 1994

Lonnie Mills
Sr. Environmental Engineer
AMAX Coal Company
P.O. Drawer PMC
Price, Utah 84501

Re: Division Order 94A, Castle Gate Mine, Amax Coal Company, ACT/007/004-DO-94A, Folder #3, Carbon County, Utah

Dear Mr. Mills:

Enclosed please find Division Order 94A that outlines which changes to the plan are required to achieve compliance with the Utah Coal Regulatory Program. The requirements cited in this Division Order are based on, but not limited to, a deficiency review conducted by the Division dated April 15, 1993, and subsequent Technical Analysis and Findings (TA). This Division Order cites those remaining deficiencies which are not relevant to the stipulation or the subject of violation N91-28-2-1.

Please address these permit deficiencies by September 19, 1994 (i.e., within 30 days of the date of this Order), or provide an acceptable schedule for submittal of complete responses for these permit changes by that date.

If you have any questions, please call me or Randy Harden.

Very truly yours,

A handwritten signature in black ink, appearing to read 'James W. Carter', written over a large, stylized circular flourish.

James W. Carter
Director

jbe
Enclosure
cc/enc: Pamela Grubaugh-Littig
Daron Haddock
Randy Harden
H:DO94ACGM.LTR

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

PERMITTEE

John Borla, P.E.
Amax Coal Company
P.O. Box 449
Helper, Utah 84528

Castle Gate Mine
PERMIT NUMBER ACT/007/004
DIVISION ORDER # 94A

SUMMARY FINDINGS
and
DIVISION ORDER

PURSUANT to R645-303-212, the Division finds the Permittee, Castle Gate Coal Company, Castle Gate Mine, ACT/007/004, to be in compliance with the Division Order issued to Castle Gate Coal Company (Castle Gate) by the Division of Oil, Gas and Mining (the Division) on December 18, 1990 (the 1990 Division Order).

The Division finds Castle Gate's permit deficient, however, in that errors and omissions have been found in the plan which must be corrected. Requirements cited in this Division Order are based on, but not limited to, a deficiency review conducted by the Division dated April 15, 1993. The deficiency review of April 15, 1993 was based upon the terms and conditions of a Stipulation and Motion (the Stipulation) between the Division and Castle Gate Coal Company, dated January 30, 1992, and approved by the Board of Oil, Gas and Mining under Docket No. 01-001, Cause No. ACT/007/004.

The Permittee has submitted changes to the mining and reclamation plan pursuant to the Stipulation in accordance with a schedule agreed to by the Division and the Permittee. Although additional changes to the plan are required, information regarding the issues of previously mined areas, AOC requirements, highwall requirements, and delineation of the disturbed area boundaries subject to the requirements of the 1990 Division Order have been submitted to and accepted by the Division. Those issues, which resulted in the appeal to the Board by the Permittee and were addressed in the Stipulation have been mutually resolved. Additional deficiencies and other deficiencies which were not directly related to reclamation requirements for pre-SMCRA disturbances remain, but are not related to the issues underlying the NOV and the Stipulation. Accordingly, the Division determines the provisions of the Stipulation to have been satisfied, and Violation N91-28-2-1 is therefore terminated.

Attached to this Division Order is a Technical Analysis and Findings (TA) identifying the elements of the 1990 Division Order for which the Permittee must still provide information. Except for those matters as specifically addressed in the TA and this Division Order, the requirements of the 1990 Division Order have been satisfied. In accordance with the TA, changes to the plan are required to achieve compliance with the Utah Coal Regulatory Program. This Division Order cites those remaining deficiencies which are not

relevant to the Stipulation or the subject of Violation N91-28-2-1. Except as specifically noted in the following requirements, the remaining deficiencies pertain to the Crandall Canyon area, which was disturbed after the implementation of SMCRA under the permanent program requirements and was not subject to pre-SMCRA criteria.

Regulations Cited

R645-301- et. seq.

Requirements

In order to comply with the regulations, the Permittee must comply with the following requirements:

- 1) **R645-301-100. Permit Application Format and Contents.** The information contained within the permit must be updated and organized to ensure that each Figure, Plate, Diagram, Analysis, etc. that is referenced is included within the Permit Application. The language used in the permit application must accurately differentiate between existing and proposed facilities, activities, treatments, etc. The Permittee must update portions of the plan, including but not limited to: the Table of Contents; Chapter I; Chapter II; Chapter III, Sections 3.7, 3.9, and 3.10; Chapter VII; and Chapter IX, to reflect changes to the plan and eliminate conflicting information. These requirements apply to the plan and the operations in their entirety and is not limited to the Crandall Canyon area.
- 2) **R645-301-200. Soils.** The Permittee must demonstrate that adequate topsoil is available for the currently approved 6" final cover depth over the disturbed areas in Crandall Canyon. Mass balance calculations for topsoil as well as a discussion of the total acreage to receive topsoil and the volume of topsoil available within the disturbed area should be provided in the text of the plan. Any disturbed areas within the Crandall Canyon area or the access road area which will not receive topsoil as part of reclamation must be clearly delineated on the maps, and adequate reclamation treatments must be described for those areas in the plan. The Permittee must provide plans to show adequate soil/spoil preparation plans (i.e. deep ripping to 18-24 inches) prior to the application of borrow soils or hydroseeding. Testing of the regraded spoil for fertilization requirements (1 sample/2.5 acres) or other approvable methodology must be included in the reclamation plan. A field sampling program must be proposed and should be undertaken to determine the nature of the top four feet of material remaining in the location of the Crandall Canyon facilities after backfilling and grading to determine that the material is not acid/toxic forming. Spoil materials remaining on the site must be characterized for their acid/toxic forming potential. Testing parameters proposed should be in accordance with Division "Guidelines for Topsoil and Overburden Management". Any alternate plans or treatments regarding designs and demonstration of compliance with the requirements of this section for the Crandall Canyon area must also include any changes to other sections of the plan as such alternatives may necessitate.

- 3) **R645-301-300. Biology.** The Permittee must provide plans to protect reclaimed areas which show adequate seedbed preparation plans, separate application of seed and fertilizer so that they will not be mixed in the hydroseeder, plans for the use of the supplemental planting mix for ephemeral/intermittent drainages, including locations shown on the reclamation maps and timing of the planting operations, and the final revegetation plans for the cut and fill slopes associated with the Crandall Canyon facilities and access road. Planting, mulching, seeding and seed mixes proposed should correspond with the information provided in Chapter IX. Reference areas or other standards for measuring success need to be provided in the plan for evaluation of the reclaimed areas to demonstrate reclamation success.
- 4) **R645-301-400. Land Use and Air Quality.** The Permittee must incorporate into the plan, identify and justify the postmining or alternate post mining land uses within the Crandall Canyon area and retention of any permanent structures according to the requirements of R645-301-400. Any changes, within the entire permit area, to the post mining land use or the retention of structures or facilities which are not currently part of the approved plan must be in accordance with the requirements of R645-301-414, which states:
"Interpretation of R645-301-412 and R645-301-413.100 through R645-301-413.334, R645-302-270, R645-302-271.100 through R645-302-271.400, R645-302-271.600, R645-302-271.800, and R645-302-271.900 for the purposes of UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES, Reclamation Plan: Postmining Land Use. The requirements of R645-301-412-130, for approval of an alternative postmining land use, may be met by requesting approval through the permit revision procedures of R645-303-220 rather than requesting such approval in the original permit application. The original permit application, however, must demonstrate that the land will be returned to its premining land-use capability (emphasis added) as required by R645-301-413.100. An application for a permit revision of this type:
414.100. Must be submitted in accordance with the filing deadlines of R645-303-220;
414.200. Will constitute a significant alteration from the mining operations contemplated by the original permit; and
414.300. Will be subject to the requirements of R645-300-120 through R645-300-155 and R645-300-200."
- 5) **R645-301-500. Engineering.** In accordance with R645-301-550, Reclamation Design Criteria and Plans, the permit application must include site specific plans that incorporate the design criteria for reclamation activities. These design criteria and plans shall include, but not be limited to: phased reclamation treatments and designs throughout the permit liability period; designs for temporary and permanent surface features, including diversions, impoundments, sediment control structures, and other facilities which will require construction throughout the reclamation process; specific plans and details for all permanent facilities to remain as part of or in conjunction with post mining land use, including roads, utilities, and structures; and maps and drawings which clearly show the areal and vertical extent of the existing facility areas

and those areas throughout all phases of reclamation. Information within the Crandall Canyon plan does not specifically address the above requirements for the elimination of all structures and facilities including the mine access road, culverts, ponds, and pad areas. Under R645-301.553, Backfilling and Grading, backfilling and grading design criteria must be described in the permit application. Disturbed areas must be backfilled and graded to: achieve the approximate original contour; eliminate all highwalls, spoil piles, and depressions, except as provided in R645-301-552.100 (small depressions), and in R645-301-553.650 (retention of highwalls); achieve a postmining slope that does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long-term static safety factor of 1.3 and to prevent slides; minimize erosion and water pollution both on and off the site; and support the approved postmining land use. The backfilling and grading plan must include sufficient mass balance calculations to incorporate the amount of material required as backfill for the mine shafts if backfilling of the two mine shafts is proposed for reclamation. Hydrologic impacts regarding groundwater and potential effects on groundwater and stability of the backfilled material in the shafts must also be presented in the plan.

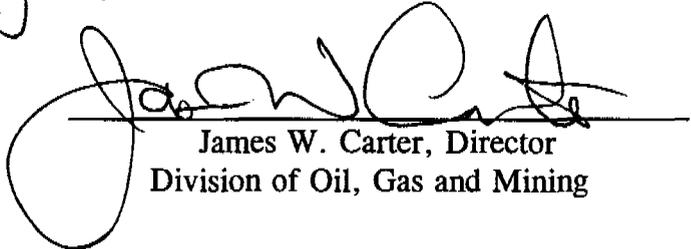
- 6) **R645-301-700. Hydrology.** The operational plan must be specific to the local hydrologic conditions and will contain steps to be taken during coal mining and reclamation operation through bond release. Hydrologic maps and supporting calculations for the Crandall Canyon facilities and the access road must be provided which show the surface hydrology and drainage and sediment control facilities to be used throughout all phases of operations and reclamation. The Permittee shall submit a reclamation plan for all phases of reclamation indicating how the relevant requirements for R645-301-730. through R645-301-760. will be met. The Permittee must correct the plan to include monitoring plans for ground water and surface water during reclamation through final bond release. These monitoring plans should reflect the requirements of R645-301-731.200, and must reflect the language of R645-301-731.212, R645-301-731.233, R645-301-731.214, and R645-301-731-224.
- 7) **R645-301-800. Bonding and Insurance.** The Permittee shall incorporate a copy of the Certificate of Liability Insurance Form into the revised Reclamation Agreement. Bonding calculations do not include the following information: a map specifying each area of land for which bond will be posted; mass balance calculations presented in sufficient detail to show backfilling and grading requirements for distribution and disposal of excess spoil and mine development waste, backfilling to meet AOC requirements, subsoil, topsoil and substitute topsoil distribution and quantities for each sub area of the permit; calculations for determination of quantities, equipment selection and productivity used in determining the bond amount which reflect the quantities determined in the mass balance calculations; determination of Phase I and Phase II reclamation activities including a map showing those facilities to be constructed and/or removed during each phase of reclamation. Cost information must be provided for all reclamation activities, whether proposed or actually accomplished, for all areas within the Permit Area and a reduction in the bond amount required

cannot be reduced until such time as phased bond release is approved by the Division. This cost information must, at a minimum, be provided prior to any application for bond release. This requirement is for the entire permit area and is not limited to the Crandall Canyon area.

ORDER

Castle Gate Coal Company is ordered to make the required permit changes in accordance with R645-303-220 and to submit a complete application for permit change to address these findings of permit deficiency, or to provide an acceptable schedule for providing such permit changes, within 30 days of date of the Order. Approval by the Division of such schedule must be obtained within 60 days of the date of this Order. If approval is not obtained within 60 days, a hindrance violation may be issued.

Ordered this 19th day of August, 1994, by the Division of Oil, Gas, and Mining.



James W. Carter, Director
Division of Oil, Gas and Mining

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

TECHNICAL ANALYSIS AND FINDINGS

**CASTLE GATE MINE
ACT/007/004
August 19, 1994**

INTRODUCTION:

On December 18, 1990, Castle Gate Coal Company was ordered to make certain permit changes in accordance with R614-303-220, and to submit a complete application for permit change addressing each finding of permit deficiency. Castle Gate Coal Company appealed the December 18, 1990, Order to the Board of Oil, Gas and Mining (the Board) on January 16, 1991. Notice of Violation No. N91-28-2-1 was issued July 5, 1991 for failure to comply with the 1990 Division Order. The NOV was appealed under a Request for Review of Agency Action filed December 6, 1991. The appeals of the 1990 Division Order and the NOV were consolidated. On September 19, 1992, the Board issued an Order of Temporary Relief, which stayed enforcement of certain abatement measures required under the NOV. Elements of the Division Order issued on December 18, 1990 were satisfied by Castle Gate and notification that abatement of those requirements had occurred was issued by the Division by letter dated November 8, 1991. Under a Stipulation and Motion dated January 30, 1992 (the Stipulation), Castle Gate Coal Company and the Division agreed that all requirements of the 1990 Division Order had been satisfied except those referenced in the NOV which were not identified in the November 8, 1991 letter. The parties also agreed in the Stipulation that this matter should be continued so that further abatement of the NOV could take place pursuant to the Stipulation.

Castle Gate Coal Company has substantially performed under the terms of the Stipulation, and the Division presents its Analysis and Findings here. Only those Division Order and NOV issues considered to be unresolved at the time of the Stipulation are addressed here.

ANALYSIS AND FINDINGS:

Division Order 2)

R614-301-122. Permit Application Format and Contents. The information contained within the permit must be organized to ensure that each Figure, Plate, Diagram, Analysis etc. that is referenced is included within the Permit Application. The language used in the permit application must accurately differentiate existing and proposed facilities, activities, treatments, etc. This information shall be provided on or before June 1, 1991.

Analysis:

Information submitted to update operation and reclamation plan information for Hardscrabble Canyon, Sowbelly Canyon, the Castle Gate area and for the Adit #1 and the Gravel Canyon areas are specific only to those sections of the plan. Updated information relative to the Crandall Canyon area and certain information relative to other areas of the plan as identified in this Technical Analysis which are yet to be revised by the permittee will require an updated table of contents and re-organization.

The baseline vegetation information included as Appendix A in the final version of Chapter 9 includes reference to maps in the consultant's report. The map numbers do not correlate with the maps in the mining and reclamation plan. Otherwise, the information in this appendix is the same as was in the plan prior to the Division Order and is adequate.

The final version of Chapter 9 does not include Appendix B. Appendix B consists of several pages of raw vegetation data and is very useful for evaluating reclamation plans and standards for success. This information was resubmitted by Castle Gate Coal Company in one of the revisions of Chapter 9, and it is not known why it was not included in the final version.

Findings:

The organization and contents of the plan must be revised to comply with this section of the Division Order. Accordingly, the permittee is hereby ordered to comply with the following requirements:

- 1) **R645-301-100. Permit Application Format and Contents.** The information contained within the permit must be updated and organized to ensure that each Figure, Plate, Diagram, Analysis, etc. that is referenced is included within the Permit Application. The language used in the permit application must accurately differentiate between existing and proposed facilities, activities, treatments, etc. The Permittee must update portions of the plan, including but not limited to: the Table of Contents; Chapter I; Chapter II; Chapter III, Sections 3.7, 3.9, and 3.10; Chapter VII; and Chapter IX, to reflect changes to the plan and eliminate conflicting information. These requirements apply to the plan and the operations in their entirety and is not limited to the Crandall Canyon area.

Division Order 3)

R614-301-140. Maps and Plans. *The PERMITTEE shall submit to the DIVISION, a schedule for providing complete and accurate maps and drawings to depict the current existing conditions for all facilities, and, proposed reclamation treatments. This schedule shall be provided on or before March 1, 1991.*

Analysis:

In accordance with the terms and conditions of the Stipulation (Settlement Agreement), the permittee has committed to a schedule for the submittal of the information required in this section of the Division Order.

The schedule submitted in conjunction with the Stipulation will be administered, revised and completed under the terms and conditions of the Stipulation. Comments regarding the submittal of this information will be made as part of the ongoing review.

Findings:

A schedule for submittal of maps and plans was provided by the permittee in accordance with the requirements of the previous order by the Division. The Division finds that the permittee has met requirements of this section of the regulations is in compliance with this section of the regulations subject to subject to the requirements of 1) **R645-301-100. Permit Application Format and Contents** for any additional maps and plans which may be required subject to deficiencies found in other sections of these analyses.

Division Order 4)

R614-301-142. Maps and Plans. *The PERMITTEE has not provided maps and plans with the permit application which distinguish among each of the phases during which coal mining and reclamation operations were or will be conducted at any place within the life of operations. At a minimum, distinctions will be clearly shown among those portions of the life of operations in which coal mining and reclamation operations occurred: prior to August 3, 1977; after August 3, 1977, and prior to either May 3, 1978; after May 3, 1978 and prior to the approval of the State Program; and, after the estimated date of issuance of a permit by the Division under the State Program. The PERMITTEE must provide identification as to the date and the use of those areas and facilities within the permit area which have been incorporated into the underground mining activities. Those areas affected by previous mining operations (including cutslopes and outslopes of pads and roads) and used in conjunction with current underground coal mining facilities are to be included in the disturbed areas. This information shall be provided on or before March 1, 1991.*

Analysis:**Castle Gate Area**

The permittee has provided revised drawings for the Castle Gate Area. The Post Mining Reclamation Treatments Map, Exhibit 3.4-3 shows the proposed final contours of the area. Plans for the area have been revised and are found in section 3.4 of the Mining and

Reclamation Plan and supporting appendices. This exhibit is also used to identify surface facilities within the Castle Gate Area.

Exhibit 3.4-1 shows the areas which were previously affected by mining operations (pre-SMCRA), and identifies those areas within the disturbed area boundaries which are used in conjunction with current mining and reclamation operations. In the text of the plan, the permittee has indicated that essentially all of the disturbed area shown with the exception of drainage controls, occurred prior to 1977.

The exhibits in the plan have been revised to more clearly depict permit and disturbed area boundaries and it appears that these boundaries are now consistent for all operational and reclamation maps in the plans. Maps have been revised to consistently reflect the disturbed and permit area boundaries. Cut slopes have been identified on Exhibit 3.4-3A. Vegetation treatments have also been depicted on the same drawings.

Crandall Canyon Area

All facilities and mining activities within the Crandall Canyon area are considered to be post-SMCRA disturbances. Accordingly the delineation of the pre-law disturbed areas and the requirements as ordered under this section of the regulations does not directly apply to the Crandall Canyon area in regard to pre-SMCRA disturbances. As part of the conditions of approval of the settlement agreement and stipulation for order of dismissal, the Division has separately ordered that deficiencies in the plan regarding the Crandall Canyon area be addressed.

Gravel Canyon and Adit #1 Area

The permittee has provided revised drawings for the Gravel Canyon and Adit #1 areas. The Post Mining Reclamation Treatments Maps, Exhibit 3.5-3 and 3.6-3 show the proposed final contours of the area, cross section locations and watershed areas used for reclamation drainage area calculations.

Exhibit 3.5-1 and 3.6-1 have been revised to show the location and the extent of the areas previously disturbed by mining (pre-SMCRA) and those portions of the previously disturbed areas which are incorporated into the disturbed area boundary for current mining operations. These exhibits are also used to identify surface facilities within the areas.

Exhibit 3.5-1 shows the areas which were previously affected by mining operations (pre-SMCRA) for the Adit #1 area and has incorporated the conveyor crossing beneath US Highway 6 & 50. The disturbed area boundary shown for the facilities has been revised to incorporate the transformers and access to them located on the southeastern corner of the site or the conveyor passing beneath the highway. Surface disturbed area and underground permit area boundaries are now provided on the drawing.

Exhibit 3.6-1 shows the areas which were previously affected by mining operations (pre-SMCRA) for the Gravel Canyon Area. Delineation of the previously disturbed areas appear to be adequately marked on the drawing and is assumed to coincide with the permit area boundary for that area.

Hardscrabble Canyon Area

The permittee has provided revised drawings for the Hardscrabble Canyon Area. The Post Mining Reclamation Treatments Map, Exhibit 3.3-5 shows the proposed final contours of the area, cross section locations and watershed areas used for reclamation drainage area calculations. Exhibit 3.3-1 shows the location and the extent of the areas previously disturbed by mining (pre-SMCRA) and those portions of the previously disturbed area which are incorporated into the disturbed area boundary for current mining operations. This exhibit is also used to identify surface facilities within the Hardscrabble Canyon Area.

Exhibit 3.3-1 sufficiently shows the areas which were previously affected by mining operations (pre-SMCRA), and identifies those area which lay within the disturbed area boundaries which are used in conjunction with current mining operations. In the text of the mining and reclamation plan, the permittee has indicated that essentially all of the disturbed area shown with the exception of drainage controls, occurred prior to 1977.

Exhibit 3.3-1 also adequately shows that the cutslopes and outslopes of pads and roads used in conjunction with current underground coal mining facilities have been included in the disturbed areas.

Sowbelly Canyon Area

The permittee has provided revised drawings for the Sowbelly Canyon Area. The Post Mining Reclamation Treatments Map, Exhibit 3.2-5 shows the proposed final contours of the area, cross section locations and watershed areas used for reclamation drainage area calculations. Exhibit 3.2-1A has also been revised to show the location and the extent of the areas previously disturbed by mining (pre-SMCRA) and those portions of the previously disturbed area which are incorporated into the disturbed area boundary for current mining operations. This exhibit is also used to identify surface facilities within the Sowbelly Canyon Area.

Exhibit 3.2-1A has been modified to delineate the pre-SMCRA areas. The drawing shows the areas which were previously affected by mining operations (pre-SMCRA), and identifies those areas which lay within the disturbed area boundaries which have been used in conjunction with current mining operations. In the text of the mining and reclamation plan, the permittee has indicated that essentially all of the disturbed area shown with the exception of drainage control installed to comply with the regulatory program, occurred prior to 1977. Exhibit 3.2-1A has been revised to show the pre-SMCRA disturbed areas both within the disturbed and adjacent areas.

The disturbed area boundary shown on Exhibit 3.2-1A has been modified to coincide with the disturbed area boundary delineated on the operations contour map or the reclamation contour drawings. Due to distortion of the orthophoto, some distortion of the disturbed area boundary is evident due to scaleability of the drawings. Disturbed area boundaries for all drawings have been made to coincide with each other.

Findings:

The revised plan information adequately provides maps and plans which distinguish among each of the phases during which coal mining and reclamation operations were or will be conducted at any place within the life of operations. Disturbances found within the permit area are pre-SMCRA and are adequately identified on the maps and within the text of the plan. The permittee has provided identification as to the date and the use of those areas and facilities within the permit area which have been incorporated into the underground mining activities. Those areas affected by previous mining operations (including cutslopes and outslopes of pads and roads) and used in conjunction with current underground coal mining facilities are included in the disturbed areas. No pre-mining disturbance occurred within the Crandall Canyon area and is not subject to the requirements of this section.

Accordingly, the Division finds that the permittee is in compliance with the requirements of this section of the regulations as they apply.

Division Order 13)

R614-301-340. Reclamation Plan. The PERMITTEE must provide plans to protect reclaimed areas for a minimum 2-year period. The PERMITTEE will revise the MRP to show 1) seedbed preparation plans (i.e. deep ripping to 18-24 inches), 2) that seed and fertilizer will not be mixed in the hydroseeder, 3) plans for the use of the supplemental planting mix for ephemeral/intermittent drainages, including locations (shown on the reclamation maps) and timing of the planting operations, 4) the final revegetation plans (as identified in the July 1990 correspondence) for the cut and fill slopes associated with the Crandall Canyon access road, 5) Clear plans for the reclamation of Gravel Canyon. This information must be provided on or before March 1, 1991.

Analysis:

Seedbed preparation plans vary slightly from one area to another. Reclamation plans for all areas include ripping slopes less than 20% to 18-24 inches. Steeper slopes in Sowbelly Gulch will be ripped using the tines of a backhoe bucket. At the Castle Gate Preparation Plant, the area will be scarified to four inches deep prior to placement of topsoil. The refuse pile in Schoolhouse Canyon will not be ripped.

Revegetation treatments are discussed in Chapter 9 of the plan. Currently the permittee has committed to seeding any remaining highwalls or exposed cut slopes. Reclamation success of these areas is presently based on incorporation of these areas into the entire

disturbed area for vegetation success. Although cut slopes and highwalls may not have the degree of revegetation success as other areas, it is believed that the more moderate adjacent slopes will compensate for this and the average density and diversity requirements will be achieved overall. Although considered adequate for approval at this time, the permittee is encouraged to develop more specific reclamation treatments and standards for reclamation success regarding the cut slopes and any highwalls proposed to be retained. To date, the current plan discusses the soiling, vegetation, and sediment control treatments for the backfilled areas only. More specific reclamation treatments, methods of monitoring, and evaluation of the cut slope areas in conjunction with vegetation monitoring and the criteria used to measure the disturbed area for density and diversity may be required by the Division prior to approval of these areas for phased bond release.

The revised Chapter 9 contains a specific commitment that fertilizer will not be mixed with seed in the hydroseeder.

A supplemental seed and planting mix is included as species list 3 in the revised Chapter 9. This mix will be used near ephemeral, intermittent, and perennial drainages as shown on reclamation treatment maps for the various areas. Chapter 9 says that drainages will be planted in mid-April when possible. Unusual favorable meteorological conditions or compliance requirements may result in planting efforts different from those specified.

Reclamation plans for the Crandall Canyon area have not been updated and must be responded to in the new Division Order. These plans must address all aspects of reclamation including engineering, soils, vegetation, land use and hydrology as applicable.

Plans for the reclamation of Gravel Canyon are presented in section 3.6.

Considerable changes in the proposed reclamation plan regarding the source and use of topsoil materials has been presented in the proposed changes to the plan. The following information reflects those changes to the topsoil requirements of the plan.

Within the existing previously disturbed surface areas, topsoil had not been removed and stockpiled. While the majority of the disturbed areas are pre-SMCRA, the Crandall Canyon area facilities were constructed post-SMCRA. In this and other post-SMCRA disturbed areas, topsoil has been removed and stockpiled. Gravel Canyon is the main repository for topsoil material within the permit area. There is insufficient topsoiling materials at most of the Castle Gate Coal Mine sites due to the abundance of the pre-SMCRA disturbances when salvaging of soil materials was not required. The exception to this is the Crandall Canyon area.

Soil resource information is found in Chapter 8 of the plan. The general soils map for Carbon County is provided as Figure 8-1 and relevant excerpts from the SCS Soils Survey are found in Appendix 8-1. Available topsoil in the permit area is limited. The terrain is rocky, and the soils are variable in nature as a result of weathering and the parent material. A description of the soil types that exist in the mine is provided in Table 8-1 of the plan.

This table provides the dominant soil types subdivided into the three main regions of the permit area: the Crandall Canyon area; the Castle Gate Preparation Plant Site area; and, the Sowbelly Gulch and Hardscrabble Canyon area. Generally, the soil types have been defined in terms of three major physiographic sections; the Wasatch Plateau, Book Cliffs, and the Mancos shale lowlands. The first two sections are typically located on steep slopes and are rocky, with relatively small areas of deep alluvial/colluvial soils in canyon bottoms and alluvial fans. The Book Cliffs section may also have a silt loam to loam surface. The Mancos shale lowland soils are high in soluble salts and are typically silty clays.

Within the existing surface disturbance areas, topsoil has not been removed and stockpiled, because the disturbances were prior to 1977. The exception is the Crandall Canyon area. In this area, topsoil has been removed and stockpiled in Gravel Canyon or is being utilized in reclamation. Three test pits were completed in the Crandall Canyon area to identify the material present. The "A" horizon material was thin, (three to five inches), but the subsoil material (which included buried "A" horizon material and other loamy-type material) was tested and found suitable as a plant growth media. In addition, the soil did not contain excessive amounts of coarse material. From this area, approximately 45,000 to 50,000 cubic yards of material has been salvaged and placed in Gravel Canyon. The permittee has indicated that an additional 8,000 cubic yards of material was stockpiled in Crandall Canyon.

The permittee has provided soil descriptions and laboratory information for thirteen backhoe pits in the mine plan area. Much of the permit area has previously been disturbed by mining activity, and the topsoil in these areas was not salvaged. Topsoil from Crandall Canyon and other areas will be utilized to topsoil the previously disturbed areas. Soil will not be salvaged on the steeper slopes of the Schoolhouse Canyon refuse area, due to the poor quality of the topsoil and the potential safety hazards involved in removing such soil. Topsoil stockpiles will be adequately revegetated using a mixture composed predominantly of cool season grasses.

Eight on-site soil material borrow areas were originally proposed by Price River Coal Company (the permittee prior to permit transfer) within the permit area. More recent amendments to the plan have eliminated the use of borrow sites for reclamation. Two borrow areas were located in Sowbelly Canyon (B-1 and B-2), three in Hardscrabble Canyon (B-3, B-4 and B-5), and three in Crandall Canyon (B-6, B-7, and B-8). Material to be removed from these borrow areas was selected based upon proximity to the mine site, apparent suitability for topsoil or subsoil substitutes, and reclaimability of the borrow areas. Material from these areas could produce approximately 52,800 cubic yards of topsoil, and 44,800 cubic yards of subsoil. All eight borrow areas were to be reclaimed using the same method as proposed for the existing disturbances. Currently these areas are moderately to thickly vegetated and removed from mining activities.

With the exception of the Crandall Canyon surface facility area, the disturbed areas within the permit area were substantially disturbed prior to passage of the Surface Mining Control and Reclamation Act of 1977 (P.L. 95-87); and, as a result, no topsoil material was

salvaged. Steep slopes, particularly at the Schoolhouse Canyon refuse area, severely limit soil removal operations; therefore, soil will not be salvaged in this area. Materials salvaged during the construction of the Crandall Canyon facilities will be utilized in the reclamation of the Schoolhouse Canyon refuse area and the Crandall Canyon facilities. Most soil materials for other pre-SMCRA disturbed areas are planned to be amended from the existing materials at the disturbed sites.

The eight borrow areas, totaling approximately 16 acres, that were proposed in the original permit would have provided a 39 percent surplus of topsoil and subsoil materials for final reclamation of all mined sites and borrow areas. Chemical and physical analyses indicated favorable conditions for successful reclamation and existing vegetation on these areas demonstrated the actual potential for feasible reclamation.

Further analyses of spoil materials presently located within the disturbed areas indicates that they are suitable for use as subsoil for the proposed reclamation. A more detailed soil survey was conducted in 1991 and as shown on Figure 8-2 in the plan. Maps included in the survey are at a scale of 1"=200' and individual soil series, where practical, were identified. This study is subdivided into individual surface facilities areas including Crandall Canyon, Castle Gate Preparation Plant Area, Sowbelly Gulch Area, and Hardscrabble Canyon Area.

Since the original soil survey, additional surveys and studies have been conducted within the permit area. Consultant's information in the plan has been updated to be consistent with the published Soil Conservation Service soil maps. Information on test pits including lab analysis are provided as Appendix 8-2.

Findings:

Soil resource information found within the plan indicates that in addition to materials salvaged from the Crandall Canyon mine facilities area that many of the disturbed areas can be adequately resoiled using amended materials from the pre-SMCRA disturbed areas. The permittee is considered to be in compliance with the regulatory requirements regarding soil resource information in accordance with the requirements of 30 CFR Sec. 783.21 and R645-301-200. In conjunction with reclamation designs, mass balance calculations regarding the Crandall Canyon area, the permittee will be required to re-evaluate all soil storage and borrow areas to determine that there are adequate topsoil or alternate soil materials for the permit area for all reclamation in the event that any design changes regarding the nature, source and disposition of soil materials to be used in the Crandall Canyon area affect soil replacement designs in other areas.

Accordingly, the permittee is hereby ordered to comply with the following requirements:

- 2) **R645-301-200. Soils.** The Permittee must demonstrate that adequate topsoil is available for the currently approved 6" final cover depth over the disturbed areas in Crandall Canyon. Mass balance calculations for topsoil as well as a discussion of the total acreage to receive topsoil and the volume of topsoil available within the disturbed area should be

provided in the text of the plan. Any disturbed areas within the Crandall Canyon area or the access road area which will not receive topsoil as part of reclamation must be clearly delineated on the maps, and adequate reclamation treatments must be described for those areas in the plan. The Permittee must provide plans to show adequate soil/spoil preparation plans (i.e. deep ripping to 18-24 inches) prior to the application of borrow soils or hydroseeding. Testing of the regraded spoil for fertilization requirements (1 sample/2.5 acres) or other approvable methodology must be included in the reclamation plan. A field sampling program must be proposed and should be undertaken to determine the nature of the top four feet of material remaining in the location of the Crandall Canyon facilities after backfilling and grading to determine that the material is not acid/toxic forming. Spoil materials remaining on the site must be characterized for their acid/toxic forming potential. Testing parameters proposed should be in accordance with Division "Guidelines for Topsoil and Overburden Management". Any alternate plans or treatments regarding designs and demonstration of compliance with the requirements of this section for the Crandall Canyon area must also include any changes to other sections of the plan as such alternatives may necessitate.

- 3) **R645-301-300. Biology.** The Permittee must provide plans to protect reclaimed areas which show adequate seedbed preparation plans, separate application of seed and fertilizer so that they will not be mixed in the hydroseeder, plans for the use of the supplemental planting mix for ephemeral/intermittent drainages, including locations shown on the reclamation maps and timing of the planting operations, and the final revegetation plans for the cut and fill slopes associated with the Crandall Canyon facilities and access road. Planting, mulching, seeding and seed mixes proposed should correspond with the information provided in Chapter IX. Reference areas or other standards for measuring success need to be provided in the plan for evaluation of the reclaimed areas to demonstrate reclamation success.
- 4) **R645-301-400. Land Use and Air Quality.** The Permittee must incorporate into the plan, identify and justify the postmining or alternate post mining land uses within the Crandall Canyon area and retention of any permanent structures according to the requirements of R645-301-400. Any changes, within the entire permit area, to the post mining land use or the retention of structures or facilities which are not currently part of the approved plan must be in accordance with the requirements of R645-301-414, which states:

"Interpretation of R645-301-412 and R645-301-413.100 through R645-301-413.334, R645-302-270, R645-302-271.100 through R645-302-271.400, R645-302-271.600, R645-302-271.800, and R645-302-271.900 for the purposes of UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES, Reclamation Plan: Postmining Land Use. The requirements of R645-301-412-130, for approval of an alternative postmining land use, may be met by requesting approval through the permit revision procedures of R645-303-220 rather than requesting such approval in the original permit application. The original permit application, however, must demonstrate that the land will be returned

to its premining land-use capability (emphasis added) as required by R645-301-413.100.

An application for a permit revision of this type:

414.100. Must be submitted in accordance with the filing deadlines of R645-303-220;

414.200. Will constitute a significant alteration from the mining operations contemplated by the original permit; and

414.300. Will be subject to the requirements of R645-300-120 through R645-300-155 and R645-300-200."

Division Order 17)

R614-301-550. Reclamation Design Criteria and Plans. *The permit application must include site specific plans that incorporate the design criteria for reclamation activities. These design criteria and plans shall include but not be limited to: phased reclamation treatments and designs throughout the permit liability period, designs for temporary and permanent surface features, including diversions, impoundments, sediment control structures, and other facilities which will require construction throughout the reclamation process; specific plans and details for all permanent facilities to remain as part of or in conjunction with post mining land use, including roads, utilities, and structures; and, maps and drawings which clearly show the areal and vertical extent of the existing facility areas and those areas throughout all phases of reclamation. This information shall be provided on or before June 1, 1991.*

Analysis:

The Permittee has re-evaluated and re-designed reclamation plans for all areas except for the Crandall Canyon area. Plans and designs included in the proposed changes to the plan include phased reclamation activities and specific designs for those permanent features such as permanent diversions throughout the permit area. Information regarding these changes is primarily found in Chapter 3 of the plan. Additionally, soils and vegetation information regarding reclamation has been updated and is primarily found in Chapters 8 and 9 of the plan. Hydrologic designs for diversions and impoundments are found in Chapter 7 of the plan.

A more detailed analysis of the plans, maps and drawings proposed by the permittee regarding reclamation plans is found under those section of these analyses as they apply. In general, the permittee should be aware that the revised reclamation plan submitted in regard to the Sowbelly Gulch, Hardscrabble Canyon, and Castle Gate areas is a marked and significant improvement over the information which was previously provided in the plan. The reclamation plan for the Crandall Canyon area still needs to be provided. Any changes regarding those designs which affect other areas within the permit area or information within the maps and text of the plan in other sections of the plan must also be provided.

Findings:

The requirements of this section of the regulations are considered to be adequate subject to the following requirements for the Crandall Canyon area. Accordingly, the permittee is hereby ordered to comply with the following requirements:

- 5) **R645-301-500. Engineering.** In accordance with R645-301-550, Reclamation Design Criteria and Plans, the permit application must include site specific plans that incorporate the design criteria for reclamation activities. These design criteria and plans shall include, but not be limited to: phased reclamation treatments and designs throughout the permit liability period; designs for temporary and permanent surface features, including diversions, impoundments, sediment control structures, and other facilities which will require construction throughout the reclamation process; specific plans and details for all permanent facilities to remain as part of or in conjunction with post mining land use, including roads, utilities, and structures; and maps and drawings which clearly show the areal and vertical extent of the existing facility areas and those areas throughout all phases of reclamation. Information within the Crandall Canyon plan does not specifically address the above requirements for the elimination of all structures and facilities including the mine access road, culverts, ponds, and pad areas. Under R645-301.553, Backfilling and Grading, backfilling and grading design criteria must be described in the permit application. Disturbed areas must be backfilled and graded to: achieve the approximate original contour; eliminate all highwalls, spoil piles, and depressions, except as provided in R645-301-552.100 (small depressions), and in R645-301-553.650 (retention of highwalls); achieve a postmining slope that does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long-term static safety factor of 1.3 and to prevent slides; minimize erosion and water pollution both on and off the site; and support the approved postmining land use. The backfilling and grading plan must include sufficient mass balance calculations to incorporate the amount of material required as backfill for the mine shafts if backfilling of the two mine shafts is proposed for reclamation. Hydrologic impacts regarding groundwater and potential effects on groundwater and stability of the backfilled material in the shafts must also be presented in the plan.

Division Order 18)

R614-301.553. Backfilling and Grading. *Backfilling and grading design criteria must be described in the permit application. Disturbed areas must be backfilled and graded to: achieve the approximate original contour, except as provided in R614-301-553.600 through R614-301-553.642; eliminate all highwalls, spoil piles, and depressions, except as provided in R614-301-552.100 (small depressions); R614-301-553.620 (previously mined highwalls); and in R614-301-553.650 (retention of highwalls); achieve a postmining slope that does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long-term static safety factor of 1.3 and to prevent slides; minimize erosion and water pollution both on and off the site; and, support the approved*

postmining land use. Information within the plan does not specifically address the above requirements. This information shall be provided on or before June 1, 1991.

Analysis:

Castle Gate Area

Information regarding backfilling and grading is found in section 3.4-4 of the mining and reclamation plan. The permittee has indicated that backfilling and grading will be done in order to establish overland flow drainage and approximate original contour. The permittee has stated in their plan that AOC is achieved by blending the spoil into the surrounding area and creating landforms which closely resemble the surrounding topography.

The cutslope areas to be retained are as analyzed by EarthFax in Appendix 3.4K and are as shown on Exhibit 3.4-3. In the conclusions of the slope stability analysis by EarthFax, a determination was made that based on the five "worst case" slopes encountered in the Castle Gate area, that all five slopes are stable and that all exceed the required minimum factor of safety of 1.3. No buttressing of any of the cut or fill slopes is necessary for the purpose of slope stability. Slopes at cross sections A and C will require fill to develop adequate drainage. The lack of fill material in the general vicinity of the cut slopes precludes the option of backfilling those slopes to the top of the exposed cuts.

Section 3.4-4 of the plan further states that the reclamation of the Castle Gate Plant area will take place over the area which was the old town site of Castle Gate. Old utilities, foundations and debris may be uncovered during the grading operation. This may result in the alteration of the contours shown on map 3.4-3 by as many as two contour intervals [4 feet] in order to keep from uncovering the old town site.

The permittee has not requested a variance for any structures or facilities to be left upon completion of reclamation or as part of an alternative postmining land use. In order to demonstrate compliance with AOC requirements, the permittee has conducted stability analysis of the slopes to be left for final reclamation to demonstrate that those slopes are designed to have a static factor of safety of 1.3 or greater. Cutslopes associated with roads and pads within the Castle Gate Area have been proposed to be left in some areas and are included in the stability analysis previously described.

In accordance with R645-301-553.130, disturbed areas must be graded and backfilled to achieve a postmining slope that does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long-term static safety factor of 1.3 and to prevent slides. Backfilled portions of the area are to be graded to the most moderate slope possible. The steepest backfilled slopes are designed to be no greater than 2h:1v (26.6° slope angle).

Cut slope areas which are to remain as part of final reclamation have been delineated on Exhibit 3.4-3A. Treatments regarding revegetation of these areas as well as other

reclamation treatments for the disturbed area facilities are to be found in Chapter 9 of the Mining and Reclamation Plan.

It is also apparent from the orthophoto and from site visits that there are areas within the disturbed area boundary which have not been substantially been disturbed by current or previous mining activities. These natural slopes within the disturbed area boundary appear, in some areas, to be much steeper than the 2h:1v maximum backfill slopes as proposed by the permittee. Slopes backfilled to a degree greater than 2h:1v are not considered to be conducive for successful soils and revegetation treatments for reclamation. However, due to the steep natural slope conditions, backfilling the site to these more moderate slopes will require the retention of cut slopes.

The drawings have been revised to incorporate several of the disturbed areas which were not previously delineated on the drawings as being included in the disturbed area boundary. Diversions and cut and fill slopes above and below roads and pad areas have been incorporated into the disturbed area boundary as were discussed previously in review of Division Order 4.

A grading cut/fill grid has been added to the reclamation designs as Exhibit 3.4-10 to more clearly delineate distribution of the cut and fill areas within the disturbed areas. Mass balance calculations were determined by elevation grids taken on 25 foot centers for the existing and proposed reclamation contours. The summary of these computer generated calculations is found on Table 3.4-10. Approximately 127,000 cubic yards of material will be moved during grading operations. Additionally, approximately 97,000 cubic yards of substitute topsoil materials will be obtained from Gravel Canyon to cover the refuse piles with 2 feet of cover/topsoil materials.

The permittee has indicated that remnants of the old town of Castle Gate and old mining facilities underlie portions of the areas to be graded and that contours may vary as a result of allowing some of these buried facilities to remain covered.

Crandall Canyon Area

All facilities and mining activities associated with the Crandall Canyon area are considered to be post-SMCRA disturbances. Reclamation treatments for the Crandall Canyon area were considered to be outside the scope of the settlement agreement. As part of the conditions of approval of the settlement agreement and stipulation for order of dismissal, the Division has separately ordered that deficiencies in the plan regarding the Crandall Canyon area be addressed. This information will be reviewed in conjunction with the Division Order for the remaining deficiencies as mentioned in the schedule for the Settlement Agreement.

Gravel Canyon and Adit #1 Areas

Information regarding backfilling and grading for the Adit #1 area is found in section 3.5-4 of the mining and reclamation plan. Reclamation contour information is shown on Exhibit 3.5-3. The permittee has stated in the plan that the area will be regraded to approximate original contour by blending spoil into the surrounding area and creating landforms which resembles the surrounding terrain. Natural sandstone cliffs exist on both the north and south sides of the portal facilities and will remain exposed. The permittee has indicated that no cut slope areas or highwalls are to remain in either Gravel Canyon or the Adit #1 area.

Backfilling and grading in the Adit #1 area will consist primarily of excavation to reestablish drainage in the canyon. Natural cliffs on either side of the canyon will not be covered as part of the reclamation activity however backfilling will occur at the base of these cliffs. Although the permittee has indicated that remnants of some of the concrete and rock wall structures within the canyon will remain for aesthetic reasons, they appear not to interfere with the reestablishment of the surface drainage system.

Excavation of resoiling materials in Gravel Canyon indicates that there is approximately 97,000 yd³ available. This indicates that there is sufficient cover material for 2 feet of cover material over the Schoolhouse Canyon refuse disposal area. Plans for the reclamation of the Schoolhouse Canyon area and associated bonding costs should be revised to incorporate those quantities.

Mass balance calculations and the grading plan for the Gravel Canyon area were revised to eliminate cut slopes which were shown to remain. The proposed grading plan now essentially eliminates all cut slopes associated with mining and reclamation activities. It should be noted that some surrounding earthwork and excavations adjacent to the disturbed area will not be reclaimed because they were associated with sand and gravel operations which occurred prior to the acquisition of the Gravel Canyon are for coal mining and reclamation activities.

Hardscrabble Canyon Area

The permittee has provided maps and drawings for backfilling and grading of the area. Information regarding backfilling and grading is found in section 3.3-4 of the mining and reclamation plan. The permittee has indicated that backfilling and grading will be done in order to establish drainage and stabilize highwalls and cutslopes. The postmining topography is found on Exhibits 3.3-4 and 3.3-5 and the permittee has stated in the plan that the proposed grading is compatible with the approved postmining land use of grazing and wildlife habitat, provides adequate drainage and long-term stability.

The permittee has stated in the plan that the disturbed areas will be graded to approximate the original contours by blending spoil into the surrounding area and creating landforms which resemble the surrounding terrain. Cutslope areas which are left, resemble

the cliffs in the surrounding topography. The retained cutslopes were analyzed by EarthFax Consulting Engineers for slope stability. This information is found in Appendix 3.3D of the plan.

The reclamation plan calls for a maximum grade of 2h:1v. In general, the fill material used at 2h:1v(26.6°) is less than the internal angle of friction for the materials to be used for backfilling which range from 30° to 45°.

Details of the post mining topography can also be found in the cross sections as provided in Exhibits 3.3-8A through F.

The permittee has not requested a variance for any structures or facilities to be left upon completion of reclamation or as part of an alternative postmining land use. In order to demonstrate compliance with AOC requirements the permittee has conducted stability analysis of the slopes to be left for final reclamation, and, has found those slopes to be designed to have a static factor of safety of 1.3 or greater. Cutslopes associated with roads and pads within the Hardscrabble Canyon area have been proposed to be left in some areas and are included in the stability analysis previously described.

The permittee has requested a variance for the retention of pre-SMCRA highwalls in the Hardscrabble Canyon area. Mass balance calculations indicate that there is insufficient spoil material which could be effectively utilized to eliminate all highwalls and cut slopes within the disturbed area. In highwall and cutslope areas where the minimum factor of safety was found to be less than 1.3, the permittee has provided additional materials at the base of these slopes to buttress the hillsides and increase the factor of safety to be in excess of 1.3. Information shown on map 3.3-5 and the supporting cross sections indicate that the area will be returned to approximate original contour, except that highwalls will be partially retained under a pre-SMCRA highwall variance. Cut slopes found within portions of the site will not be completely eliminated (see comments under Division Order 19 below). Constraints which limit backfilling and grading in these areas are primarily the lack of excess materials which can effectively be used to eliminate these cuts and highwalls, and, in some cases, fill required to eliminate such cut slopes or highwalls would create slopes which would not be stable. Because the criteria for highwall retention relates to previously mined areas, refer to Division Order 19 below for those findings.

In accordance with R645-301-553.130, disturbed areas must be graded and backfilled to achieve a postmining slope that does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long-term static safety factor of 1.3 and to prevent slides. Backfilled portions of the area are to be graded to the most moderate slopes possible. The steepest backfilled slopes are designed to be no greater than 2h:1v (26.6° slope angle), which is considered to be less than the angle of repose for the backfilled materials.

Cut slope areas have been defined on the cross sections provided in the mining and reclamation plan. The maps and cross sections provided show the extent of the disturbed area boundaries.

Sowbelly Canyon Area

Information regarding backfilling and grading is found in section 3.2-5 of the mining and reclamation plan. The permittee has stated in the plan that backfilling and grading will be done in order to establish drainage and stabilize highwalls and cutslopes. The postmining topography is found on Exhibits 3.2-4, 3.2-5 and 3.2-9.

The permittee states in the plan that the disturbed areas will be graded to approximate the original contours by blending spoil into the surrounding area and creating landforms which resemble the surrounding terrain. Cutslope areas which are left, resemble the cliffs in the surrounding topography. The retained cutslopes were analyzed by EarthFax Consulting Engineers for slope stability and geologic compatibility with the surrounding areas. This information is found in Appendix 3.2F of the plan.

The reclamation plan calls for a maximum grade of 2h:1v. Typically, the fill material used and graded to a maximum slope of 2h:1v (26.6°) is less than the internal angle of friction for the materials to be used for backfilling which range from 30° to 45°. This indicates that although the general limitation of slopes to 2h:1v can be successfully accomplished, it also indicates that in some cases, steeper slopes could be attained where necessary to blend in with the surrounding slopes and topography.

During field construction, it is suggested by the Division that steeper slopes could be used in a limited manner to visually improve reclamation treatments. An example of this application would be the creation of the talus slopes proposed by the permittee at the base of cut slopes and highwalls which are to remain. The uppermost portions of these slopes could be graded to a steeper angle to provide a transition to the steeper adjacent slopes. This should be limited to the last 6-10 vertical feet to minimize the length of these slopes and maintain stability. This would create concave slopes which would more easily blend into the surrounding area yet maintain more moderate slopes over most of the areas to be backfilled.

The permittee has further revised the plans to locate and identify the highwalls within the Sowbelly Canyon area. Information regarding highwalls is found in section 3.2-2 and are located on Exhibit 3.2-3.

Areas shown on the Post Mining Reclamation Treatment Map, Exhibit 3.2-5, have been revised in the second submittal to more clearly depict all cut slope areas to remain within the disturbed area boundaries. The plan calls for the complete elimination of portal highwalls within the Sowbelly Canyon area by backfilling over the area to a slope of 2h:1v.

The Reclamation Grading Cut/Fill Grid and mass balance calculations have been modified as shown on Exhibit 3.2-9 to indicate that all highwall areas will be eliminated.

The permittee has not requested a variance for any structures or facilities to be left upon completion of reclamation or as part of an alternative postmining land use. In order to demonstrate compliance with AOC requirements, the permittee has conducted stability analysis of the slopes to be left for final reclamation, and has provided calculations to demonstrate that those slopes are designed to have a static factor of safety of 1.3 or greater. Cutslopes associated with roads and pads within the Sowbelly Canyon area have been proposed to be left in some areas and are included in the stability analysis previously described.

The highwall area is included in the stability analysis and can be seen in Picture #1 of Appendix 3.2F-A and a part of the highwall is depicted in Section A-A'. Although the area was found stable by analysis, elimination of the highwall area by backfilling is proposed. No portal highwalls within the Sowbelly Canyon area are proposed to be retained by the permittee and consequently, no variance for the retention of highwalls is required.

The permittee has provided maps and drawings for backfilling and grading of the area. Mass balance calculations indicate only a small surplus of cut material as compared to the amount of fill required which could be available to further reduce cut slopes in some of the areas, but not a sufficient amount to be utilized to eliminate all cut slopes within the disturbed area. All highwall areas within the Sowbelly Canyon area will however be completely eliminated by backfilling. None of the areas analyzed for stability indicated a factor of safety of less than 1.3 even prior to the addition of backfill materials at the toe of the cuts. The permittee has provided additional materials at the base of these slopes to buttress the hillsides which would further increase the factors of safety shown in the geotechnical analysis. Information shown on map 3.2-5 indicates that the area will be returned to approximate original contour. Cut slopes found within portions of the site will not be completely reduced or eliminated and are delineated on the drawing. Constraints which limit these areas are primarily the lack of excess materials which can effectively be used to eliminate these cuts, and, in some cases, fill required to eliminate such cut slopes would not be considered stable. All cut slopes areas within the facilities will be backfilled or eliminated except for those areas as shown on Exhibit 3.2-5.

Information regarding cut slopes has further been expanded in the plan to incorporate cut slopes into reclamation plan while maintaining AOC. In conjunction with the stability analysis, the permittee has provided geologic information to show that the geomorphic process and the geology of these cut slope areas blend in with similar natural features adjacent to the disturbed area.

Soils and Biology Requirements

All cut slopes and portions of highwalls that remain after grading will be seeded as per a specific commitment in Chapter 9. These areas will be subject to the same revegetation requirements as the rest of the site. When testing for revegetation success, they will be incorporated into the vegetation sampling sites.

Although cut slopes and highwalls will be seeded, the steepness of the slopes and lack of soil preparation make plant establishment difficult. Even if plants are able to establish on these cut slope areas, their productivity and cover will be low because of the decrease in effective precipitation. Any vegetation that becomes established on remaining cut slopes and highwalls will be essentially unavailable for any animals.

Adjacent, undisturbed slopes average about 1.5h:1v. Although this slope is acceptable for wildlife use, the Bureau of Land Management considers slopes steeper than 2h:1v to be unsuitable for grazing. Regraded slopes will not be steeper than 2h:1v, but most will be about 4h:1v to 3v:1h. These slopes will be more compatible with the postmining --land use than undisturbed slopes. If all of the disturbed areas were graded to the same slopes as those adjacent to these areas, they would not be suitable for a grazing postmining land use.

Although the amount of vegetation on remaining highwalls and cut slopes will be reduced compared to the amount that would be present if these were completely backfilled, the total amount of vegetation over the entire area is expected to increase. Effective precipitation and moisture retention will be increased on regraded slopes for two reasons. First, the planar extent of area will be decreased because the slopes will be reduced. This will increase the amount of precipitation received per unit planar area. Second, with reduced slopes, the amount of runoff will be decreased and the amount of infiltration will increase. With the increased amount of water available, vegetation productivity and cover should increase markedly compared to completely backfilling all of the cut slopes and highwalls. This increase in forage should compensate completely for areas where vegetation is sparse and unavailable.

Additionally, vegetative cover is defined in terms of vertical projection rather than planar. The areal extent of remaining highwalls and cut slopes, and, thus, the extent of areas with very limited amounts of vegetation, will be relatively small. As discussed above, vegetative cover on the regraded areas is expected to perform better than if the highwalls and cut slopes were completely eliminated. Therefore, revegetation is considered to be feasible.

Currently the permittee has committed to seeding any remaining highwalls or exposed cut slopes. Reclamation success of these areas is presently based on incorporation of these areas into the entire disturbed area for vegetation success. Although cut slopes and highwalls may not have the degree of revegetation success as other areas, it is believed that the more moderate adjacent slopes will compensate for this and the average density and diversity requirements will be achieved overall. Although considered adequate for approval at this time, the permittee is encouraged to develop more specific reclamation treatments and standards for reclamation success regarding the cut slopes and any highwalls proposed to be retained. To date, the current plan discusses the soiling, vegetation, and sediment control treatments for the backfilled areas only. More specific reclamation treatments, methods of monitoring, and evaluation of the cut slope areas in conjunction with vegetation monitoring and the criteria used to measure the disturbed area for density and diversity may be required by the Division prior to determination of these areas for phased bond release.

Hydrology Requirements

Many steep slopes occur within the disturbed areas. Restoration of drainage areas was limited by elevations fixed above and below the disturbed areas. Drainage channels were designed to avoid construction on fill materials where possible. The permittee provided alternate channel designs for those areas where fills were encountered. The steep gradient of several of the channels warrants use of the underlying bedrock or competent foundation materials beneath the proposed reclamation channels to the extent possible. As an example the drainage channel at the #4 Mine area, located in Hardscrabble Canyon utilizes the cliff-forming materials within the drainage channel as a drop structure, eliminating approximately 18 feet of vertical head on the system which significantly reduced the slope of the channel through the remainder of the fill area.

The most stable slopes from the standpoint of erosion and sediment control are concave slopes. Slopes within the disturbed area were graded to achieve the most moderate slopes possible. Cut slopes which are to remain are in consolidated material or bedrock and were found to be stable. Many of these cut slopes have been in existence for 40-50 years and show little or no potential for uncontrolled or excess erosion. More moderate slopes in the fill areas reduce the surface erosion and the sediment loading from the backfilled areas. If cut slopes eliminated in some of the areas proposed, the slope of the fill materials would be in excess of 2:1 and in some cases, steeper than the angle of repose. Drainage control on slopes is considered difficult and is not recommended in Utah.

Findings:

Backfilling and grading plans subject to the requirements of this section have been found adequate by the Division, with the exception of the plans and information for the Crandall Canyon area which remain to be submitted by the permittee.

Constraints and limitations due to the physical location and orientation of the mine facilities in canyons and steep slope areas and having a majority of the area being disturbed pre-SMCRA has led to difficulty in compliance regarding backfilling and grading of the disturbed area in a typical manner. Many of the areas involved in backfilling and grading required additional analysis and demonstration by the permittee to satisfy the requirements of backfilling and grading to meet AOC requirements. Additionally, limitations involved in backfilling and grading requirements had to be considered as they apply to or affect all other performance standards involved in demonstrating reclaimability, including but not limited to performance standards required by land use, revegetation, soils and hydrology. In many areas, cut slopes will remain as was recognized in the original Technical and Environmental Analysis (TEA). However, a more detailed analysis and justification for the retention of these cut slopes has been provided by the permittee which demonstrate compliance with the performance standards, meet the specialized requirements for the retention of pre-SMCRA highwalls, and to demonstrate overall reclaimability of the site.

Retention of cutslopes plays an important role in reclamation stability and success. In some cases, cutslope retention will result in a lower gradient in reclamation areas that would have otherwise had excessively steep and long slopes if completely backfilled. This reduces surface erosion which enhances plant production and the postmining land uses of livestock grazing and wildlife habitat. The Division has considered the benefits of cutslope retention when examining AOC compliance and has determined that such features increase the overall likelihood for reclamation success in consideration of all performance standards involved in demonstrating reclaimability. Adverse affects of the retention of cut slopes in this instance include the visual or esthetic impact in allowing portions of the cut slopes to remain. Based on the information presented in the plan, these cut slope features are not dissimilar to naturally occurring slopes formed by erosion or geologic features found in the steep canyon areas where the mine facilities are found. The visual impact of allowing these cut slopes to remain has been found to be insignificant by the Division in comparison to the benefits of providing more moderate slopes, a more stable drainage configuration, and the enhanced likelihood of overall revegetation success. Accordingly, the Division finds that the Permittee has adequately demonstrated that all reasonably available spoil will be used in backfilling the slopes within the permit area and that cutslopes will be eliminated to the extent technically feasible.

The nature and extent of the pre-SMCRA disturbances within the permit area can only be evaluated and approved to the extent that such impacts are currently known. Information provided in the plan demonstrates that reclamation can be accomplished to meet AOC requirements. During actual reclamation activity, additional considerations or constraints due to actual site conditions may require adjustments to the designs proposed in the plan. Evaluation of the site based on as-built designs showing where field modifications were made will be necessary for final determination and demonstration of compliance with AOC requirements prior to Phase I bond release.

Accordingly, the Division finds the permittee to be in compliance with the requirements of this section of the regulations and Division Order 18 with the exception of those requirements as made in 5) **R645-301-500. Engineering**. Any additional information which may be required subject to deficiencies found is in regard to the submittal of plans and designs for the Crandall Canyon area unless otherwise noted.

Division Order 19)

R614-301-553.500. Previously Mined Areas. The PERMITTEE shall demonstrate in writing, that the volume of all reasonably available spoil material is insufficient to completely backfill the reaffected or enlarged highwalls to be retained throughout the mine facilities. The PERMITTEE must also demonstrate that the remaining highwalls shall be eliminated to the maximum extent technically practical in accordance with the following criteria: (1) All spoil generated by the remining operation and any other reasonably available spoil shall be used to backfill the area. Reasonably available spoil in the immediate vicinity of the remining operation shall be included within the permit area. (2) The backfill will be graded to a slope which is compatible with the approved

postmining land use and which provides adequate drainage and long term stability. (3) Any highwall remnant shall be stable and not pose a hazard to the public health and safety or to the environment. The PERMITTEE shall demonstrate, to the satisfaction of the regulatory authority (DIVISION), that the highwall remnant is stable. (4) Spoil placed on the outslope during previous mining operations shall not be disturbed if such disturbances will cause instability of the remaining spoil or otherwise increase the hazard to the public health and safety or to the environment. This information shall be provided on or before June 1, 1991.

Analysis:

Castle Gate Area

Discussion of previously mined areas is found in section 3.4-2 of the plan and is indicated on Exhibit 3.4-1. Within the Castle Gate area, two mines, the old preparation plant facilities, and the historic town of Castle Gate lie within the disturbed area boundaries.

While much of the mining activity within and adjacent to the permit area is historic, essentially all of the mining operations as they exist, with the exception of the unit train loadout facilities, are part of an ongoing mining operation which was active prior to and continued operation through the implementation of SMCRA. The unit train loadout area was added to the permit as a minor permit modification.

No "highwalls" exist within the Castle Gate area. Mining operations within this area consist of coal preparation and loadout facilities. No underground mining operations are proposed within this area.

There are however, cut slopes found within the Castle Gate area resultant from the construction of roads, pads, and other surface facilities. The Division has determined that, in some cases, cut slope areas can remain when they are found to be stable, compatible with the post mining land use and meet AOC requirements. Further discussion of these cut slopes area is discussed under the analysis provided under Division Order 18.

Exhibit 3.4-1 does not conform closely to the disturbed area boundaries shown on other drawings within the mining and reclamation plan due primarily to distortion of the orthophoto. However the general location and the extent of the disturbed areas and those areas which have been previously disturbed within the permit area are considered to be sufficient to meet the requirements of the regulations.

Crandall Canyon Area

All facilities and mining activities within the Crandall Canyon area are considered to be post-SMCRA disturbances. Accordingly the delineation of the pre-law disturbed areas and the requirements as ordered under this section of the regulations do not apply to the Crandall Canyon area. As part of the conditions of approval of the settlement agreement and

stipulation for order of dismissal, the Division has separately ordered that deficiencies in the plan regarding the Crandall Canyon area be addressed.

Gravel Canyon and Adit #1 Areas

Gravel Canyon is a source for resoiling materials to be used to cover the refuse materials. The area was disturbed prior to coal mining and reclamation activities by utilization of the canyon as a source of materials for road construction. Castle Gate claims valid existing rights to mine within 100 feet of US Highway 6 & 50 since the property was acquired to conduct coal mining activities prior to the enactment of SMCRA. The pre-mining disturbances for the Gravel Canyon area are shown on Exhibit 3.6-1.

The Adit #1 area was first opened and mined in 1888 and essentially all of the area within the disturbed area boundary was previously affected by pre-law mining operations. As shown on Exhibit 3.5-1, the previously disturbed area is shown to encompass the entire disturbed area and also extends primarily to the south of the area shown on that drawing.

Technically, the disturbances within Gravel Canyon prior to SMCRA were not caused by coal mining activities prior to SMCRA, but were affected by gravel operations within the area. However, the permittee has not prepared the reclamation design that would require application of "previously mined areas" provisions of the regulations to this portion of the plan. Accordingly, no request for any variance in regard to backfilling and grading or to highwalls has been made in this section of the plan. Based on the information presented in the plan, Gravel Canyon meets AOC requirements in accordance with the general backfilling and grading requirements.

The Adit #1 area was previously disturbed by coal mining operations. The permittee has not requested nor does the reclamation plan indicate any request for highwall retention or from a variance from AOC requirements.

Hardscrabble Canyon Area

Section 3.3-5 of the proposal discusses a request for highwall variance from approximate original contour (AOC). The permittee has indicated that the highwalls created to access the coal outcrops in Hardscrabble Canyon were created during the early 1960's prior to the advent of SMCRA and were not reaffected after SMCRA. The location and extent of the highwalls in which the permittee is requesting a variance are found on Exhibit 3.3-2 and are the No. 3 portal highwall, the No. 4 portal highwall and the No. 5 mine return air shaft.

The permittee has concluded in their plan that the highwalls in the Hardscrabble Canyon area are not significantly greater in height or length than the dimensions of existing cliffs in the surrounding area. The highwalls are similar in structural composition to the preexisting cliffs in the surrounding area and are compatible with the visual attributes and geomorphic processes of the area. Demonstration of slope stability analysis and an evaluation of the highwalls proposed to be retained is provided in Appendix 3.3D in a consultant's report

entitled Slope Stability Analyses, Hardscrabble Canyon, Carbon County, Utah, prepared by EarthFax Engineering, Inc., dated February 14, 1992.

The permittee has stated in the plan that spoil material is unavailable in Hardscrabble Canyon for several reasons. When the highwalls were cut in the 1960's, most of this material was pushed onto the sideslopes of the canyons. The permittee has stated that this material has since settled into a stable and vegetated condition and if disturbed, will create unstable slope conditions. There has been no additional spoil material generated during the remining operations because remining did not reffect or enlarge the existing highwalls.

The permittee has indicated that any available spoil materials as a result of stream channel excavation will be used to create talus slopes at the base of the highwalls. No other reasonably available spoil material exists in the immediate vicinity of the remining operations.

In accordance with section R645-301-600, the permittee has requested a variance for the retention of highwalls. Information found in Appendix 3.3D has been provided by the permittee to address the specific requirements for highwall retention, and to demonstrate that slopes left upon the completion of backfilling and grading operations will be stable and meet a static factor of safety of 1.3.

The permittee has demonstrated by design that the "retained" highwalls and cut slopes proposed within the disturbed area boundary are not significantly greater in height or length than the dimensions of existing cliffs in the surrounding areas. It was found that cliffs adjacent to and within the surrounding area varied from 200 to greater than 1,000 feet in length with heights varying from 5 to 200 feet. Highwalls and cut slopes within the disturbed area measure from 250 to 300 feet in length and to 60 feet in height. These measurements and the documentation found in Appendix 3.3D indicate that the highwalls and the cut slopes to be retained within the disturbed area are not significantly greater in height or length than the surrounding cliffs found in the area.

The retained highwalls and cutslopes within the disturbed area boundary are of similar structure and composition in comparison to the surrounding natural cliffs and ledges. Many of these highwalls are partially or nearly completely composed of sandstone rock which is part of the cliff forming members of the region. Other cut slopes and highwalls are similar to stream downcutting and erosion which can be found within and adjacent to the disturbed areas. This colluvial material was found in most cases to be reasonably well cemented with sufficient cohesion to remain as stable cut slopes. These highwalls are geomorphically comparable to the cliffs and downcut slopes found throughout the area. In comparison, disturbed fills and regraded areas lack the cohesive structure of these undisturbed soils within the cut slopes, and must be maintained at a more moderate slope than that of the cut slopes.

Approval for incomplete elimination of highwalls in previously mined areas can be accomplished in accordance with R645-301-553.500. The permittee has requested a variance from AOC requirements for incomplete elimination of highwalls. Based on the design

information presented in the proposal, the permittee provides a demonstration to show that the "retained" highwalls are not significantly greater in height or length than the dimensions of existing cliffs in the surrounding areas. Information presented in the EarthFax slope Stability Analysis indicates that: the residual highwalls have been shown by the permittee to be similar in structural composition to the preexisting cliffs in the surrounding area and is compatible with the visual attributes of the area; and, the residual highwall is compatible with the geomorphic processes of the area. Backfilling and grading to meet AOC requirements is further discussed above under Division Order 18.

Sowbelly Canyon Area

In the Slope Stability Analysis, Appendix 3.2F, part 3.5, the permittee has incorporated discussion and analysis of the highwalls in Sowbelly Canyon. The permittee has proposed complete elimination of these portal highwalls.

The permittee has identified the highwalls associated with the No. 5 Mine fan portal and adjacent portal located to the southeast of the main No. 5 Mine portal access. The permittee has incorporated these highwall areas into the text of the mining and reclamation plan and discusses the elimination of these highwalls as part of the reclamation activities.

Based on the current information found in the plan regarding backfilling and grading of the Sowbelly Canyon area, the Division considers that these highwall can be completely eliminated by backfilling of the area and that no request for a highwall variance is necessary.

Reclamation contours and the backfilling and grading plans have been revised to allow for the elimination of the portal highwalls by backfilling. Present contour information in the reclamation maps and designs shows sufficient backfilling of the area for elimination of the highwalls.

Findings:

The revised information proposed by the permittee meets the general requirements for previously disturbed areas as required under this section of the regulations. Although information has not been updated for the Crandall Canyon area, this area is not subject to the specific design and performance standards for previously mined areas.

The permittee has not requested a variance from AOC requirements except in regard to the partial retention of pre-SMCRA highwalls for three areas found within the Hardscrabble Canyon area. The Division has evaluated and found that retention of portions of these pre-SMCRA highwalls is warranted and in accordance with the requirements of this R645-301-553.600. The Division will allow for a variance from AOC requirements for preexisting highwalls based on the design information presented in the plan. The permit will need to be revised to indicate that such a variance has been allowed for. An AOC Variance For Preexisting Highwalls will be incorporated into the permit as "Attachment C" following completion of the public notice and comment period required for this permit revision. A

draft copy of this exhibit has been attached to this TA. Final approval for this variance will be upon successful completion of the public notice and comment period and issuance of a revised permit by the Division.

Accordingly, the Division will make written findings and, by permit revision, provide a variance for highwall retention for the previously disturbed highwalls. These written findings are to be incorporated into the permit and the permit will be clearly marked indicating that such a variance has been provided for in the approved plan.

Division Order 21)

R614-301-731. Operation Plan. General Requirements. The operational plan must be specific to the local hydrologic conditions and will contain steps to be taken during coal mining and reclamation operation through bond release. The PERMITTEE needs to correct the MRP to include monitoring plans specific to ground water and surface water during reclamation through bond release. These monitoring plans should reflect the requirements of R614-301-731.200, and must reflect the language of R614-301-731.212, R614-301-731.233, R614-301-731.214, and R614-301-731-224. The PERMITTEE shall submit a reclamation plan for all phases of reclamation indicating how the relevant requirements for R614-301-730. through R614-301-760. will be met. This shall be required on or before June 1, 1991.

Analysis:

The original plan provided each of the surface facility areas with a sediment-control plan based on diversion ditches and berms to route flow around the disturbed area's sediment ponds, sediment sumps, and straw bale dikes. These structures are all currently existing. Berms surround the perimeter on the facility areas and are constructed to a height of approximately 2 feet. These serve to direct runoff from the adjacent hillsides away from the facilities, reducing the required sediment pond size. At the same time, they prevent the uncontrolled discharge of flow from the facility areas into the hydrologic regime. Required peak flow capacities were originally calculated from the "rational formula" method, which tends to provide figures that are higher in comparison with checks against the SCS method for small watersheds. The runoff coefficient, i , was estimated to be 0.4 for small watersheds and overland flow and 0.5 for larger drainage areas. The rainfall intensity parameter, i , was calculated from the time of concentration (t_c) for each watershed and the amount of precipitation that would occur at that time for an hour. Parameters utilized in the rational formula for each watershed were given in tables 7-4 and 7-5, chapter VII of the permit application.

A re-evaluation of the hydrologic design parameters for the mine area was provided by the permittee. Diversion ditches were originally designed to carry flow from a 10-year, 24-hour storm. The exception is the refuse pile diversion at Castle Gate which is designed to carry the 100-year, 24-hour storm peak since it is designed as a permanent structure. Design

information regarding diversions has been revised in the plan to accommodate 6-hour storm events as are now allowed under the current regulations.

Permanent diversions, especially in regard to Sowbelly and Hardscrabble Canyon areas have been relocated to more closely resemble pre-mining drainage. During mining operations these drainages were pushed up against the sides of the canyons, often undercutting existing cut slopes and were found unsuitable to remain as post mining channels. Evaluation of the drainage patterns in the canyons indicated that retention of the existing sediment ponds and impoundments was not feasible for reclamation activities. Reconfiguration of these drainages has been made in an effort to maintain drainage patterns in a manner that suits the post mining land use of wildlife and grazing. Additionally, the establishment of these designed drainages indicated that all cut slopes and steep areas could not be returned precisely to the original premining contours without establishing steep fill slopes which were not conducive to revegetation, and were subject to accelerated surface erosion. Drainage restoration and sediment control were found to considerably influence limitations on the amount and type of backfilling and grading that could be accomplished in those areas.

Sediment pond volume is calculated from the 10-year or 25-year, 24-hour storm peak flow and the sediment volume that can be expected from the disturbed area. In response to a Division violation, the permittee revised the sediment control plans for both Sowbelly Gulch and Hardscrabble Canyon. Generally, sediment ponds in both areas are now designed to act in series with the most downstream ponds provided with emergency spillways. Pond volumes for the most part, are sufficient to contain water and sediment runoff resulting from the 10-year, 24-hour precipitation event. Pond volumes for those in Castle Gate area are sufficient to hold the 25-year storm runoff but are simultaneously discharging reservoir storage. Sediment values were originally calculated at 0.035 acre feet per acre of disturbed area. These figures have more recently been adjusted using soil losses calculated with the Universal Soil Loss Equation (Chapter VII, of the permit application). Sediment ponds at the mine site are generally excavated, although several are supplied with freeboard dikes, or berms, to increase the storage size.

Operationally, pond sizes were found to be suitable with the exception of those ponds within the Hardscrabble Canyon area. Based on the current sequence and timing of reclamation activities for the area, the permittee has committed to upgrade the capacity of the ponds in the event that reclamation requiring the reconfiguration of the drainage control system in the pond does not occur before 1995. Due to the return frequency of an event occurring within that two-year period, the likelihood of having a storm event greater than the current configuration of those facilities is considered unlikely.

Ponds are not receiving discharge from the inflows of mine openings. Only one portal is currently discharging, the Utah Fuel Portal, and that discharge point has an individual NPDES permit. A general NPDES permit covers all other potential sediment pond discharge points at the mine site.

The revised sediment control plans for Sowbelly Gulch and Hardscrabble Canyon are focused primarily on the their function required during phased reclamation activity. All mining has ceased within these areas and scheduled reclamation is occurring. Sowbelly Gulch will have sediment pond for primary sediment control during Phase I reclamation activity for most of the disturbed area. Due to the limiting configuration of the site, some alternate sediment controls areas are also provided in disturbed areas which cannot effectively report to sediment ponds. Hardscrabble Canyon is more narrow and restrained in its configuration and the use of sediment ponds for even Phase I reclamation design were found impractical. In the re-establishment of the drainages for the canyon, the disturbed areas on either side of the drainages were long and narrow. Ephemeral drainages from side canyons and other small drainage areas also bisect the disturbed area making the areas which could potentially report to sediment ponds insignificantly small in relation to the size of the ponds that would need to be constructed. The permittee has proposed alternate sediment control practices such as increased mulching, increasing the roughness of the regraded areas, and the installation of silt fences and straw bales to achieve adequate sediment control on those areas.

Hydrologic designs and for the Crandall Canyon area remain to be updated by the permittee. The plan must be specific to the local hydrologic conditions and must contain designs and steps to be taken during coal mining and reclamation operations and throughout all phases of bond release. Hydrologic maps and supporting calculations for the Crandall Canyon facilities and the access road must be provided which show the surface hydrology, drainage and sediment control facilities to be used throughout all phases of operations and reclamation.

Monitoring plans required for both surface and groundwater for the entire permit area are not specific especially in regard to their requirements through all phases of reclamation activity. These plans need to be updated to accurately reflect the detailed water monitoring plan to be utilized throughout all phases of mining and reclamation activities.

Findings:

The permittee must submit a revised reclamation plan for all phases of reclamation indicating how the relevant requirements for R645-301-730. through R645-301-760. will be met. The permittee must revise the plan for the entire permit area to include monitoring plans specific to ground water and surface water during reclamation through final bond release. These monitoring plans should reflect the requirements of R645-301-731.200, and must reflect the language of R645-301-731.212, R645-301-731.233, R645-301-731.214, and R645-301-731-224. Additional requirements, especially in regard to the anticipated changes in the reclamation design for the Crandall Canyon area will require re-evaluation of the hydrologic designs for reclamation when they are provided.

The requirements of this section of the regulations are considered to be adequate subject to the following requirements for the Crandall Canyon area. Accordingly, the permittee is hereby ordered to comply with the following requirements:

- 6) **R645-301-700. Hydrology.** The operational plan must be specific to the local hydrologic conditions and will contain steps to be taken during coal mining and reclamation operation through bond release. Hydrologic maps and supporting calculations for the Crandall Canyon facilities and the access road must be provided which show the surface hydrology and drainage and sediment control facilities to be used throughout all phases of operations and reclamation. The Permittee shall submit a reclamation plan for all phases of reclamation indicating how the relevant requirements for R645-301-730. through R645-301-760. will be met. The Permittee must correct the plan to include monitoring plans for ground water and surface water during reclamation through final bond release. These monitoring plans should reflect the requirements of R645-301-731.200, and must reflect the language of R645-301-731.212, R645-301-731.233, R645-301-731.214, and R645-301-731-224.

Division Order 25)

R614-301-800. Bonding and Insurance. *The PERMITTEE shall provide to the DIVISION, the Certificate of Liability Insurance Form which is incorporated into the Reclamation Agreement. Bonding calculations do not include the following information: a map specifying each area of land for which bond will be posted; mass balance calculations presented in sufficient detail to show backfilling and grading requirements for distribution and disposal of excess spoil and mine development waste, backfilling to meet AOC requirements, subsoil, topsoil and substitute topsoil distribution and quantities for each sub area of the permit; calculations for determination of quantities, equipment selection and productivity used in determining the bond amount which reflect the quantities determined in the mass balance calculations; determination of Phase I and Phase II reclamation activities including a map showing those facilities to be constructed and/or removed during each phase of reclamation. This information shall be required on or before June 1, 1991.*

Analysis:

Updated reclamation costs for bonding calculations have not been submitted by the permittee to date. These changes to the plan are anticipated in conjunction with submittal of the revised information required in the new Division Order resulting from this TA.

The underground permit areas (lease areas) have been added to show the extent of those permitted areas. It is intuitive that where the disturbed areas pass outside of the underground permitted areas that the disturbed area boundary and the permit boundary become one in the same. For bonding purposes, the permittee will need to determine the acreages for each sub area and the total area for the surface disturbed area, the area affected by surface and underground mining operations, and, the total mining and reclamation permit area which incorporates all areas to be affected by both surface and subsurface mining and reclamation operations. This information should be tabled and incorporated into Chapter 1 of the Mining and Reclamation Plan.

Backfilling and grading requirements, mass balance calculations and topsoil distribution requirements cannot be completed until such time as the revised information for the Crandall Canyon area is provided. Cost estimates for reclamation treatments for the entire permit area to determine the bond amount will need to be provided in conjunction with the submittal of information required for Crandall Canyon area.

Findings:

While the permittee has submitted adequate information to meet the requirements of the intent of the Stipulation agreement, information regarding bonding is outstanding and should be submitted in conjunction with the information required for the Crandall Canyon area and other information that is required by the Division subject to this order.

Accordingly, the permittee is hereby ordered to comply with the following requirements:

- 7) **R645-301-800. Bonding and Insurance.** The Permittee shall incorporate a copy of the Certificate of Liability Insurance Form into the revised Reclamation Agreement. Bonding calculations do not include the following information: a map specifying each area of land for which bond will be posted; mass balance calculations presented in sufficient detail to show backfilling and grading requirements for distribution and disposal of excess spoil and mine development waste, backfilling to meet AOC requirements, subsoil, topsoil and substitute topsoil distribution and quantities for each sub area of the permit; calculations for determination of quantities, equipment selection and productivity used in determining the bond amount which reflect the quantities determined in the mass balance calculations; determination of Phase I and Phase II reclamation activities including a map showing those facilities to be constructed and/or removed during each phase of reclamation. Cost information must be provided for all reclamation activities, whether proposed or actually accomplished, for all areas within the Permit Area and a reduction in the bond amount required cannot be reduced until such time as phased bond release is approved by the Division. This cost information must, at a minimum, be provided prior to any application for bond release. This requirement is for the entire permit area and is not limited to the Crandall Canyon area.

SUMMARY:

Castle Gate Coal Company has substantially performed under the terms of the Stipulation agreement. Although there are some elements of the 1990 Division Order which remain to be satisfied as noted in these analysis, those requirements primarily involve providing complete and adequate reclamation plans for the Crandall Canyon area. Other deficiencies such as bonding cost estimates will require completion of the Crandall Canyon area reclamation designs prior to their submittal. All issues regarding design and performance standards pertaining to previously disturbed areas, which was the essence of the appeal resulting in the Stipulation agreement have been met to the satisfaction of the Division. Those remaining elements are being segregated from the 1990 Division Order, the NOV and

the Stipulation into a new Division Order based on this Technical Analysis. Upon issuance of the new Division Order mandating compliance with outstanding deficiencies as found in these analysis, the Permittee will be considered in compliance with the requirements of the Utah Coal Regulatory Program.

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AOC VARIANCE FOR PREEXISTING HIGHWALLS

In accordance with R645-301-553.500, the Division has reviewed and accepted a variance from Approximate Original Contour (AOC) requirements for incomplete elimination of highwalls in previously mined areas in accordance with the following findings:

1. Remining operations on previously mined areas, or underground mining operations conducted prior to August 3, 1977, and continued after that date, that contain the preexisting highwall(s) comply with the requirements of R645-301-537.200, R645-301-552 through R645-301-553.230, R645-301-553.260 through R645-301-553.900, and R645-302-234, except as provided in R645-301-553.500.
2. The requirements of R645-301-553.110 and R645-301-553.120, requiring that elimination of highwalls do not apply to remining operations or underground mining operations conducted prior to August 3, 1977, and continued after that date where the volume of all reasonably available spoil is demonstrated in writing to the Division to be insufficient to completely backfill the reaffected or enlarged highwall. The highwall(s) will be eliminated to the maximum extent technically practical in accordance with the following criteria:
 - A. All spoil generated by the remining operation and any other reasonably available spoil will be used to backfill the area;
 - B. The backfill will be graded to a slope which is compatible with the approved postmining land use and which provides adequate drainage and long-term stability;
 - C. Any highwall remnant will be stable and not pose a hazard to the public health and safety or to the environment. The operator has demonstrated, to the satisfaction of the Division, that the highwall remnant is stable; and
 - D. Spoil placed on the outslope during previous mining operations will not be disturbed if such disturbances will cause instability of the remaining spoil or otherwise increase the hazard to the public health and safety or to the environment.

SPECIFIC CONDITIONS OF VARIANCE

This variance from Approximate Original Contour for Preexisting Highwalls is issued in conjunction with the Coal Mining and Reclamation Permit. This AOC variance is specific to the following locations and conditions:

1. Variance from AOC for Preexisting Highwalls shall include only those areas which have been identified in the plan and approved by the Division and are as follows:
 - A. The location and the extent of the highwalls as delineated on Exhibit 3.3-2, as the No. 3 portal highwall, the No. 4 portal highwall and the No. 5 mine return air shaft.
 - B. (Other maps and highwall references for other mine facilities area may be included in the highwall variance upon review and approval by the Division.)
2. The terms and conditions of this permit may be modified at any time by the Division, if it determines that more stringent measures are necessary to ensure that the operations involved are conducted in compliance with the requirements of the State Program.