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## State of Utah

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January 5, 1993

TO: Daron Haddock, Permit Supervisor

FROM: Randy Harden 

RE: Castle Gate Area Submittal, AMAX Coal Company, Castle Gate Mine, ACT/007/004-92B, Folder #2, Carbon County, Utah

**Summary:**

In accordance with Stipulation under Docket 91-001, AMAX Coal Company has submitted revised plans for the Castle Gate Area. These plans were received by the Division on May 1, 1992, with supplemental information received on May 5, 1992. Based on a review of these plans, additional information was requested by the Division. This information was received on September 8, 1992. The following review is in consideration of the outstanding information as a result of the Division Order issued to AMAX and the information incorporated into those proposed changes to the mining and reclamation plan.

Comments and completeness of the information within the text of this review is in regard only to those areas described in Castle Gate Area unless noted otherwise in the comments. Determination of completeness of the response to the Division Order and Compliance of those requirements for approval cannot be made until such time that all of the required information has been submitted as required by the Division Order.

**Analysis:**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.*

**Proposal:**

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Information submitted for the Castle Gate Area is specific only to that section of the plan. A new table of contents for section 3.4 of the plan has been provided.

**Analysis:**

With respect to section 3.4 of the plan, the operator has revised the plan. However, requirements of this section of the Division Order apply to the plan in its entirety.

The current cross reference to the coal mining rules is not in detail and not sufficiently detailed to locate information which is meant to address specific regulatory requirements. Many of the rules listed within the cross reference are listed as not applicable when they need to be addressed in the plan. This cross reference should be presented in the plan as part of the mid-term permit review process. However, organization of the plan with regard to consistent map numbering, table of contents, and referencing within the text of the plan is considered as part of this Division Order.

The operator has committed to provide a cross reference between the permit documents and the R645 rules by December 1, 1992.

**Deficiencies:**

None.

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.*

**Proposal:**

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

**Analysis:**

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 adequacy of the information submitted as required by this Division Order are found under other sections of this review as they apply.

**Deficiencies:**

None.

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.*

**Proposal:**

The operator 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.

Exhibit 3.4-1 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 Castle Gate Area.

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 been depicted on the same drawings.

**Analysis:**

Exhibit 3.4-1 shows the areas which were previously affected by mining operations (pre-SMCRA), and identifies those areas 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 operator has indicated that essentially all of the disturbed area shown with the exception of drainage controls, occurred prior to 1977. In context with the requirements of this section of the regulations, it can be assumed that these disturbances occurred prior to August 3, 1977.

The exhibits in the plan have been revised to 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.

Exhibit 3.4-3A has further been revised to show the cut slope areas which will be left in conjunction with the reclamation activities. The operator has also delineated various reclamation revegetation treatments which are to be applied for the preparation plan area.

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 operator 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. This will need to be provided in conjunction with the submittal of information required for other areas as scheduled in the Settlement Agreement.

Previous concerns regarding reclamation treatment areas, permit area boundaries and disturbed area boundaries appear to have been addressed by the operator.

**Deficiencies:**

None.

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.*

**Proposal:**

This Division Order was not specifically addressed as part of the Castle Gate Area submittal.

**Analysis:**

The requirements of this section of the Division Order apply to the plan in its entirety.

**Deficiencies:**

This information should be provided with the information provided for the Remaining areas as part of the Settlement Agreement.

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.*

**Proposal:**

Existing hydrology information and reclamation operations are shown on Exhibits 3.4-2 and 3.4-2A respectively.

The operator has stated that grading will be done in order to establish drainage and stabilize highwalls and cutslopes. The operator states that the disturbed areas are to be graded to approximate the original contours by blending into the surrounding area and creating landforms which resemble the surrounding terrain. Cutslope areas which are left, resemble the cliffs in the surrounding topography and were analyzed for slope stability.

The operator's plan states that during the grading process, berms and temporary diversions will be eliminated, grading will establish surface overland flow drainage where possible, culverts will be removed, sediment ponds will be removed, and paved surfaces will be removed prior to the placement of soil. The operator will construct permanent stream channels and provide for alternative sediment control practices following reclamation construction.

Phases of reclamation are discussed in section 3.4-4 of the proposal. Phase I activities include demolition, grading, soil preparation and soil amendments, and sediment control measures. Phase II activity is listed as removal of the sediment ponds, ditches and berms with seeding and mulching activities for these areas. Phase III work includes reclamation monitoring of water and vegetation.

The timing of the reclamation activities is provided in section 3.4-5.

The operator has indicated that the post mining land use for the Castle Gate Area is wildlife and grazing.

**Analysis:**

The operator has incorporated the closure and sealing of the underground injection wells which are used in conjunction with the coal processing facility, and, monitoring wells associated with the refuse disposal facility. The location of the injection wells is referenced on drawing 3.4-2A to Exhibit 3.10-1. The text of the plan has been revised to incorporate these injection and monitoring holes into the operation and reclamation plans.

The operator has revised the plan to incorporate monitoring requirements for the School House Canyon refuse facility is discussed in the text of the Mining and Reclamation Plan in section 3.4-2. The operator has committed to quarterly inspections

of the refuse facilities and submittal of a certified annual reports to the Division. The operator has also indicated that the installed piezometers will be checked during inspections for water depth, which is considered critical to maintain the stability of the refuse structure as discussed in the consultant's report by Golder and Associates in Appendix 3.4A.

The configuration of the top of the refuse pile has been changed to reflect the original design parameters. Additionally, contours now show sufficient slope for water to drain off of the top of the pile.

Details of the unit train loadout are found on Exhibit 3.8-5, Unit Train Loadout, Elevation and Drainage Controls. At this time no detailed review by the Division of the information contained within chapter 3.8 has been made. This information will be reviewed in conjunction with the review for the remaining areas as mentioned in the schedule for the Settlement Agreement.

Some structures are proposed to remain as part of the final reclamation configuration. These primarily include culverts which will remain to protect utility water lines within and adjacent to the disturbed area boundary, and culverts to remain to pass water beneath the adjacent railroad right-of-way. Additionally, the operator has identified a utility corridor within the disturbed area boundary, which is adjacent to the railroad right-of-way. These facilities to remain are identified on Exhibit 3.4-3. The culvert structures and the utility corridor associated with the buried waterlines in the property are not considered as an alternate post mining land use, but rather as reasonable structures to protect adjacent and existing facilities and utilities.

**Deficiencies:**

None.

**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.*

**Proposal:**

Information regarding backfilling and grading is found in section 3.4-4 of the mining and reclamation plan. The operator has indicated that backfilling and grading will be done in order to establish overland flow drainage and approximate original contour. The operator indicates that AOC is achieved by blending the spoil into the surrounding area and creating landforms which 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 cut slope are precludes the option of backfilling that slope to the top of the exposed cut.

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.

**Analysis:**

The operator 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 operator 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 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 in general, 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. Specific 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 steeper than the 2h:1v maximum backfill slopes as proposed by the operator. The operator has indicated that treatments for reclamation of those areas is also discussed in Chapter 9 of the plan.

The drawings have been revised to incorporate several of the disturbed areas which were not delineated on the drawings into 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 in the previous review of this section of the plan.

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 operator 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.

**Deficiencies:**

None.

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 remaining operation and any other reasonably available spoil shall be used to backfill the area. Reasonably available spoil in the immediate vicinity of the remaining 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.*

**Proposal:**

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 permit area, two, mines, the old preparation plant facilities, and the historic town of Castle Gate.

**Analysis:**

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, cutslopes found within the Castle Gate area. 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. Refer to comments 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.

**Deficiencies:**

None.

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.*

**Proposal:**

No comments regarding the above division order are part of this review.

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.*

**Proposal:**

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Bonding information previously found in section 3.4 has been eliminated from the plan.

**Analysis:**

It is anticipated that the bonding information previously provided for the Castle Gate Area will be incorporated into the final plan and that calculations will be provided on or before the due date for the submittal of all remaining areas. Mass balance calculations, especially in regard to Gravel Canyon cannot be completed until all topsoil distribution requirements are determined for the entire permit area.

**Deficiencies:**

1. The operator will need to provide revised bonding calculations in conjunction with the Remaining Areas.

**RECOMMENDATIONS:**

Outstanding concerns and deficiencies found for the Castle Gate Area are considered minor with regard to the engineering aspects of the Mining and Reclamation Plan. Some deficiencies within the plan are noted which will need to be addressed by the Operator prior to approval but in conjunction with submittal of information noted as the Remaining areas under the Settlement Agreement. These deficiencies deal primarily with reclamation cost estimates for determining the bond amount and reclamation treatments which are considered general to all areas of the Mining and Reclamation Plan. No specific engineering deficiencies were found or noted in this review in regard to the Castle Gate Area.

cc: BTEAM