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September 17, 1992

TO: Daron Haddock, Permit Supervisor

FROM: Randy Harden

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

Summary:

In accordance the with Stipulation under Docket 91-001, AMAX Coal Company has submitted revised plans for the Sowbelly Canyon Area. These plans were received by the Division on August 18, 1992.

The following review 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 Sowbelly Canyon 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:

Information submitted for the Sowbelly Canyon area is specific only to that section of the plan. A new table of contents for section 3.2 of the plan has been provided.

Analysis:

With respect to section 3.2 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.

Deficiencies:

The organization and contents of the plan must be revised to comply with this section of the Division Order. This information should be provided with the information provided for the Remaining areas as part of the Settlement Agreement.

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.

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 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 was intended 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.

Analysis:

Exhibit 3.2-1A does not delineate the pre-SMCRA areas as indicated by the title of the exhibit or as discussed in the text of the plan. The drawing must be revised to sufficiently show the areas which were previously affected by mining operations (pre-SMCRA), and identify 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 operator has indicated that essentially all of the disturbed area shown with the exception of drainage controls, occurred prior to 1976. In context with the requirements of this section of the regulations, it can be assumed that these disturbances occurred prior to August 3, 1977, but the drawing must be revised to show the pre-SMCRA disturbed areas both within the disturbed area and adjacent areas.

The disturbed area boundary shown on Exhibit 3.2-1A does not coincide with the disturbed area boundary delineated on the operations contour map or the reclamation contour drawings. Disturbed area boundaries for all drawings should be made to coincide with each other.

Deficiencies:

1. Map 3.2-1A must be revised to delineate the areas previously disturbed by mining both within and adjacent to the disturbed area boundaries.

2. Disturbed area boundaries for all drawings must be made to coincide with each other.

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 Sowbelly Canyon 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:

The operator has indicated in section 3.2-5(1) that all structures have been removed except for the lower substation which will remain for the life of the mine complex. Upon final reclamation of all other mining facilities, the lower substation will be removed and disposed of accordingly.

The operator has stated that grading will we done in order to establish drainage. 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.

Design criteria for slope stability was conducted by EarthFax as found in Appendix 3.2F. Many of the existing cut slopes will be completely backfilled or buttressed at the base of the cuts to allow these areas to bend in with the surrounding area.

Roads inside of the disturbed area boundary will be removed as part of the reclamation plan.

Phases of reclamation are discussed in section 3.2-6 of the proposal. The timing of the reclamation activities calls for reclamation work to occur in Sowbelly Canyon in the fall of 1992.

Analysis:

Information found in the plan does not discuss the pre-mining nor the intended post-mining land use. The land use for the Sowbelly Canyon area should be incorporated into the text of the plan.

The reclamation timetable and the drawings do not clearly indicate the sequence and timing for the reclamation activities planned for the Sowbelly Canyon area. First, the extent of regrading and revegetation work to be accomplished on the site for the Sowbelly area and the substation area should be separately delineated on the drawings. Delineation of the two areas and a description of the separate activities within the timetable are needed for determination of bonding costs and criteria for bond release of those areas throughout the life of the mining operations. Second, the sequence and timing of the reclamation activities does not break out or identify the steps needed to install and remove sediment ponds, other sediment control measures, and regrading and revegetation of those areas aa standards for reclamation success have been met.

Deficiencies:

1. The operator needs to identify the pre- and post-mining land uses in the plan for the Sowbelly Canyon area.

2. The operator needs to proved more detail on the drawings and in the text of the plan to segregate reclamation activities based on reclamation treatments and timing for reclamation work.

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 3.2-5 of the mining and reclamation plan. The operator 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 3.2-4, 3.2-5 and 3.2-9.

The operator has indicated 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 3.2F 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°.

Analysis:

Areas shown on the Post Mining Reclamation Treatment Map, Exhibit 3.2-5, do not clearly depict all cut slope areas to remain within the disturbed area boundaries. Primarily, these areas include, but are not limited to, the fan portal highwall area and the cut slopes located to the north and east of the fan portal area. These areas were found to be at lopes greater than 2:1 and were not marked as cut slopes to remain.

The operator has indicated that there are no highwalls in the Sowbelly area. However, a highwall is found where two portals exist on a bench to the southeast of the main #5 mine access portal. One of these portals had a fan installed on it previously and can be identified by the concrete formed structure. The second portal is immediately to the north of the fan portal. The highwall consists of the area above and between these two portals. Based on the contour information found on Exhibit 3.2-5 and Exhibit 3.2-3, little or no backfilling or grading of this portal highwall area is shown as part of the reclamation plan. The Reclamation Grading Cut/Fill Grid as shown on Exhibit 3.2-9 further indicates that little or no backfilling of this area is planned to occur. The operator must incorporate the elimination of this highwall area into the reclamation plan. The Operations contour map and the Surface Facilities Map should show the locations of all three of the portals found within the disturbed area boundary.

Recontouring of the highwall area above the fan portals must be accomplished to backfill and eliminate to the extent possible, the highwall. Steep slopes which are not

shown as cut areas to remain should be reduced to slopes less than 2:1 or where applicable, marked as cut slopes to remain.

The operator has not requested a variance for any structures of 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 Sowbelly Canyon area have been proposed to be left in some areas and are included in the stability analysis previously described. The highwall area as described above was 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 does appear feasible and the most likely solution during reclamation rather than requesting a highwall variance.

The operator has provided maps and drawings for backfilling and grading of the area. Mass balance calculations indicate that there is a small excess of cut material 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 highwalls and cut slopes within the disturbed area. 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 operator 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 indicate that much of the area will be returned to approximate original contour, except that 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.

With the exception of identification and addressing the elimination of the highwall area above the fan portals, the operator is considered to have adequately addressed the requirements for this provision for a variance from AOC requirements. 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 the cut slopes must also be expanded in the plan to incorporate other reclamation treatments that are proposed in the plan. To date the current plan discusses the soiling, vegetation, and sediment control treatments for the backfilled areas only. The operator has committed to revise and rewrite Chapter IX, Revegetation, to add reclamation treatments, methods of monitoring, and evaluation of

the cut slope areas in conjunction with the midterm permit review. Discussion of these cut slope areas needs to be provided in the plan in conjunction with vegetation monitoring and the criteria used to measure the disturbed area for density and diversity prior to any final determination for AOC adequacy and to allow a highwall variance from AOC requirements. This information is currently being provided by the operator and is under review by the Division.

Deficiencies:

1. Detailed information needs to be presented in the plan for reclamation treatments of cut slope areas to remain on final reclamation. This information must address methods for monitoring and evaluating vegetation cover and diversity for the entire disturbed area, including the cut slopes. This information should be provided with the information for the remaining areas as part of the Settlement Agreement.

2. Highwall area located within the Sowbelly Canyon area must be identified and the elimination of these highwalls or suitable information providing for a variance from AOC requirements must be presented in the plans for reclamation.

3. Regraded slopes greater than 2h:1v must be identified as either cut slopes to remain or as fill areas where the natural conditions allow for steeper slopes (such as rock outcrop areas).

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.

Proposal:

In the Slope Stability Analysis, Appendix 3.2F, part 3.5, the operator has indicated that there are no highwalls in Sowbelly Canyon. No discussion is found in section 3.2-5 of the plan regarding the elimination of highwalls.

Analysis:

The operator has failed to locate and identify the highwall associated with the No. 5 Mine fan portal and adjacent portal located to the southeast of the main No. 5 Mine portal access. The operator need to incorporate this highwall area into the text of the mining and reclamation plan and discuss the elimination of this highwall 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 the highwall can be completely eliminated by backfilling of the area and that no request for a highwall variance would be necessary. However, the operator must either indicate sufficient backfilling and grading of the highwall area or request a variance as appropriate for this area.

In the event of highwall mitigation, reclamation contours and the backfilling and grading plans will need to be revised to allow for the elimination of the highwall by backfilling. Present contour information shows insufficient backfilling of the area for elimination of the highwall.

Deficiencies:

1. The operator shall locate and identify highwalls associated with the No. 5 Mine portals. Designs and plans must be revised to meet the regulatory requirements pertaining to highwalls.

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:

Bonding information previously found in section 3.2 has been eliminated.

Analysis:

It is anticipated that the bonding information previously provided for Sowbelly Canyon 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 in June 15, 1992. Mass

balance calculations, especially in regard to Gravel Canyon cannot be completed until all topsoil distribution requirements are determined for the entire permit area.

Reclamation costs associated with the reclamation planned for the Sowbelly Canyon area must be factored into the bond amount until such time as Phase I bond release is accomplished and approved by the Division. Until such time, the reclamation costs associated for the work planned must be incorporated into the bond amount. Bond cannot be reduced and adjusted by reclamation work accomplished without following bond release criteria. Costs associated with each phase of reclamation should be segregated and identifiable to ease in the implementation of phased bond release for each separate area.

Deficiencies:

1. The operator will need to provide revised bonding calculations in conjunction with the submittal of information for the remaining areas as required in the Settlement Agreement.

RECOMMENDATIONS:

Deficiencies found within the review of the Sowbelly Canyon area are not considered to be significant in light of the regulatory requirements, but must be addressed and approved by the Division prior to the implementation of reclamation activities for the site.

Some of the outstanding items in regard to the Sowbelly Canyon area also reflect information which needs to updated or provided to address deficiencies for all areas in general and will be incorporated into the submittal of information for the remaining areas as part of the Settlement Agreement.