0011

STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

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March 18, 1986

CERTIFIED RETURN RECEIPT REQUESTED
P-592-429-532

FILE COPY

Mr. C. H. Gent
P. O. Box 330
Honaker, Virginia 24260

Dear Mr. Gent:

Re: Mid Term Permit Review, Genwal Coal Company, Crandall Canyon Mine, ACT/015/032, Emery County, Utah

The Crandall Canyon Mine is presently undergoing a mid-term permit review and the attached review document represents the Division's concerns with Genwal's failure, to date, to provide the Division with a technically accurate updated and reorganized Mining and Reclamation Plan. The Division of Oil, Gas and Mining (DOGM) and representatives of Genwal Coal met November 1, 1985 and formulated a three fold strategy for compliance at Crandall Canyon:

a. Establishment of a mid-term permit review schedule with all deficiencies to be addressed and approved by May 1, 1986.

b. Resolution of NOV N85-4-5-2, 2 of 2 by a successful completion of the mid-term permit review process and subsequent operations to be conducted on site.

c. Establishment of temporary stabilization measures that allowed Genwal to operate through the winter with reduced potential for environmental degradation during the period prior to construction according to plans to be approved in the mid-term review process (as stated in the above).

The above strategy was designed to avoid issuance of a Cessation Order resulting from Genwal's failure to satisfy NOV abatement dates in 1985 for the above referenced Notice of Violation.

My present concern is for Genwal's ability to submit complete and approvable plans for the mid-term permit review by May 1, 1986. The approval process will require two (2) weeks review time by DOGM. While I do not wish to preclude Genwal's ability to submit adequate plans, the length of the enclosed deficiency document suggests a renewed effort on Genwal Coal Company's part must be made to ensure approval on or before May 1, 1986. Cessation of mining operations is not an action that I like to recommend, but that may be the only option available to the Division of Oil, Gas and Mining if the approval date of May 1, 1986, is not met. I look forward to working with you and your permit staff prior to this date in order to avoid exercising that option.

Sincerely,

L. P. Braxton

L. P. Braxton
Administrator
Mineral Resource Development
and Reclamation Program

jvb
Enclosure
cc: A. Klein
C. Gent, Jr.
A. King
L. Witkowski
K. May
J. Leatherwood
S. Linner
0198R-16

Genwal Coal Company, Inc.
Crandall Canyon Mine, Tract 1
Mid-Permit Review
ACT/015/032
Emery County, Utah

March 18, 1986

DETERMINATION OF COMPLETENESS

UMC 771.23 Permit Applications - General Requirements for Format and Contents - SCL

The application cannot be considered complete until a regulation by regulation index to the document, as previously requested is submitted.

In addition the application cannot be considered clear and concise until the following items are rectified:

Many of the chapters contained no cover page for the Appendices, so it is difficult to tell where they start.

All chapters contain incorrect references to appendices (for example Appendix V-1 referred to as Appendix 5-1).

In chapter IV plate 4-1 is referred to repeatedly as plate 3-1, which is very confusing.

UMC 782.13 Identification of Interests - SCL

.13(g) The applicant still has not addressed whether or not it has interests in lands which are contiguous to the area covered by the permit. This should be on page II-5, part 2.2 of the application.

UMC 783.13 Description of Hydrology and Geology - General Requirements - DC & DD

The applicant must submit an analysis and summary of all previously collected ground and surface water quantity and quality data. Appendices 7-2 and 7-3 should be displayed graphically with a narrative explaining the results of all water quantity and quality data.

The applicant shall describe in detail the geologic formations present in the vicinity of the mine area and regional area. The geologic description shall include formation characteristics, lithofacies changes, thickness and extent of formations, location (distance) of formations and relationship to the mine area.

The mine plan shall include a diagram showing the stratigraphic column for mine plan and adjacent areas.

UMC 783.14 Geologic Description and Ground Water Information - DD

Although no water has been contacted from mining over the Starpoint Sandstone, the Starpoint Sandstone is considered an aquifer in the mining area. The applicant shall provide information and data that defines the location, the extent, the quality and piezometric surface of the aquifer. This information is necessary to evaluate the aquifer and calculate any adverse impacts from future mining and to correlate this aquifer to springs in the area.

UMC 783.14 Geology Description - DC

The applicant must resubmit Items VI-4 and VI-3 and replace them with a legible and readable Figure. Item VI-4 is not a stratigraphic cross section as stated in the text; this discrepancy must be clarified. Item VI-1 must be referenced in the text as to where the cross sections are located. A plan view map must be included showing the locations of these cross sections. The applicant states on Page VI-3 that the Starpoint Sandstone is 700-900 feet thick. This information must be referenced as it conflicts with the work performed by Doelling, 1972. Item VI-5 that is referenced to on Page VI-3 cannot be found in the document. The applicant must clarify this discrepancy.

Item VI-1 shows the upper coal seam to be 10 feet thick. This conflicts with information provided by the operator that this seam is not of mineable thickness. Item V1-2 is not a coal isopach and overburden map as stated on Page VI-5 but rather an acid-base accountability report. This discrepancy must be clarified.

UMC 783.15 Ground Water Information - DC

The applicant must submit site specific information that describes the regional aquifer in the vicinity of the mine permit area. This information should include a lithologic description of the aquifer, thickness of the aquifer, the conditions under which water occurs in the aquifer (confined or unconfined), elevation of the water table or potentiometric surface, gradient of the water table or potentiometric surface, uses of water in the aquifer and quality of the water. Additionally, information should be submitted that describes the recharge, storage and discharge characteristics of the aquifer. This information should be site specific and not regional in nature.

The statement on Page VI-5 that the mine is dry needs to be revised to coincide with Section 7.1.3.1. The statement in Section 6.5.3 that the aquiferous potential of the formations in Crandall Canyon has been described in other documents submitted to DOGM needs clarification. These documents need to be identified and the pertinent information from these documents should be included as part of this MRP. Item number 2 in Section 6.5.3 conflicts with Section 7.1.2.1 This conflicting information must be clarified. Item number 3 on Page VI-6 contains information on the permeability of the shales in the Blackhawk Formation and interconnection of the sandstones. This information needs to be referenced. Additionally, the statement in Item number 3 on page VI-6 that faults and fractures do not increase water yielding characteristics in the Blackhawk Formation conflicts with Section 7.6.2.1 and 7.1.2.2.

UMC 783.16 Surface Water Information - DC

The applicant must summarize Appendix 7-2 and identify minimum, maximum and average discharge conditions in Crandall Creek. The applicant must also summarize Appendix 7-3 and identify seasonal variations of dissolved solids, suspended solids, acidity, pH, total and dissolved iron and total manganese.

UMC 783.17 Alternative Water Supply Information - DC

The applicant must identify the alternative sources of water supply that could be developed to replace the existing sources in the event that contamination, diminution or interruption occurs due to mining. Page III-18 states that Genwal has purchased 20 shares of Huntington-Cleveland Irrigation Company water and that the paperwork is included in Chapter 7. This paperwork has not been included in Chapter 7. The applicant must submit the documentation.

UMC 783.19 Vegetation Information - LK

In chapter IX the applicant has proposed to use the baseline data for the success standard for areas of less than 30% slope. However, in chapter III, it is indicated that cover and productivity for the entire area will be compared with the reference area for success determination. This discrepancy needs to be clarified. If the baseline data is to be used, please submit the raw data sheets to the Division.

On page IX-5, the applicant refers to a letter from the Soil Conservation Service (SCS) which certifies the range condition of the reference area. This letter must be included as part of the plan.

On page IX-6, a reference is given to shrub studies that were to be conducted. The reference cited does not contain any data or information about shrub studies, please correct.

The disturbed area on Plate 9-3 and Plate 2-1 was planimetered several times, with an average disturbed area of 8.44 acres. Yet, on pages IX-3 & IX-4, it states that only 6.1 acres are disturbed, and the reclamation plan, states that only 4.55 acres will be reclaimed and 1.2 acres of road will not be reclaimed. This totals 5.75 acres total disturbance, not the 6.1 acres indicated in Chapter IX or the 8.44 acres planimetered by the Division staff. Please correct these figures.

Plate 9-1 show the area of potential disturbance overlaying the vegetation types. Since the potential disturbed area does not reflect what was (or will be) actually disturbed it will be necessary to show the actual disturbed area overlaying the vegetation types. However, this map may be delayed until all approved changes for the surface facilities are constructed. Also, the boundaries of the reference area must be shown on this map as well as permanently marked in the field (not just the transects from baseline sampling).

UMC 783.21 Soil Resources Information - JSL

The operator should include a statement in Part 1.2, 3.4.4.1, and 8.1 describing the pedogenic processes and physio-chemical changes that will occur to the soil resource. The submitted soil mass - balance table is insufficient. The anticipated depth of topsoil and subsoil removal, and the volume of previously stockpiled soil material must be represented for each soil series. The topsoil/subsoil replacement depth can be calculated from the potential salvaged soil volumes. The applicant has committed to remove soil equal to a redistribution depth of 14.8 inches, yet the permit application states that a depth of 0.75 feet will be redistributed. Please clarify. All calculations should be submitted.

UMC 783.24 Maps: General Requirements - DD

The applicant shall submit a current geologic map that depicts all geologic formations on and adjacent to the mine plan area. The map shall also show any fracture zones or faults in the area. A legend should be used to depict all symbols or abbreviated material.

UMC 783.24(g) Maps: General Requirements - RS

The applicant has not addressed this section. The applicant must submit a map depicting the location of all water supply intakes for Crandall Creek and Huntington Creek for a distance of one (1) mile downstream from the confluence of Crandall and Huntington Creeks.

UMC 783.24 Maps: General Requirements - JRH

A listing of the deficiencies in maps, plans, tables and exhibits is given below. Comments with respect to these data refer to the adequacy of the maps and plans with respect to scale, certification, readability, and clarity. Technical deficiencies with respect to the information contained on the drawings and exhibits is made under the appropriate regulation concerning the information.

The table of contents and the respective exhibits and drawings are not consistent throughout the plan. Some of the plates and exhibits switch between numeric and roman numbers. For consistency, the articles should be numbered in either one format or the other. The listing below has revised some of the numbers from roman to numeric.

The exhibits, tables and figures listed in the tables of contents for each chapter do not include page numbers for reference. The Operator should include page numbers of tabbed pages for reference to these materials.

EXHIBITS:

1-2 EIS Location Map - the EIS Location map is illegible. The Operator shall resubmit a clear copy of this exhibit.

1-3 Cross Reference - The Cross Reference referred to under Chapter 1 of the permit application is missing.

2-7 Negative Unsuitability Determination - This item was found in the plan. However, this item is only a portion of the document and a reference as to the source and date of the publication should be included with item II-7.

3-1 Pillar Recovery and Roof Control Plan - Portions of this document are not legible, the copy included in the plan from the edited draft copy submitted to the Division previously. The Operator shall locate a legible copy of the Pillar Recovery Plan and insert it into the plan.

3-3 USGS Letter of Approval - This document is not legible, the copy included in the plan from the edited draft copy submitted to the Division previously. The Operator shall replace the copy with a suitable one.

3-4 Letter Confirming PE Registration - This letter confirming certification of the mine site plan design is dated December 8, 1981. Considerable changes in the surface design has been made in the plan. All supplemental information, revisions and amendments to the plan should bear their own certification.

3-5 Ventilation Plan - This document is not legible, the copy included in the plan from the edited draft copy submitted to the Division previously. The Operator shall replace the copy with a suitable one. Page 9 of the ventilation control plan requires the signature of the Company Official. The copy provided does not have a signature on it.

3-7 Fire Prevention Plan - The fire prevention plan submitted by the Operator does not include approval by the BLM. The Operator shall provide proof of approval of the coal fire prevention plan.

3-9 Waste Removal Plans - The information provided in the correspondence does not address all the conditions required for waste removal. The Operator shall revise the mine operation plan to incorporate non coal waste removal into the text of chapter 3.

3-10 Waste Storage Removal Agreement - This item was found in the plan and is considered adequate. However, disposal of sediment pond materials was specifically excluded in September 23, 1985 and October 24, 1985 letters to the Operator, from off site disposal to landfills. The Operator shall revise the non coal waste disposal plan in accordance with these conditions. The conditional approval from State Health is not required in the mine plan.

3-11 Revegetation Cost Monitoring Agreement - This item contains comments written on it from the edited copy of the draft submittal sent to the Division. This item should be replaced with a clean copy.

3-12 Bond Estimate - This item contains comments written on it from the edited copy of the draft submittal sent to the Division. This item should be replaced with a clean copy. The submittal is

not adequate and does not contain sufficient information to determine the bond amount. The bond estimate provided does not correspond to the revisions in the operation and reclamation plan and is not considered complete or adequate.

4-1 Emery County Zoning Regulations - This item contains comments written on it from the edited copy of the draft submittal sent to the Division. This item should be replaced with a clean copy. Also, the table of contents lists the item as "Emery County Zoning Regulations" and the label on the actual document is "Emery County Zoning Ordinance". These should be revised to read the same.

5-4 Cultural Resource Report, Sherman Shelter - Portions of this document are not legible. The Operator shall replace the copy with a suitable one.

6-1 Geological Cross Section - Portions of this document are not legible. The Operator shall replace the copy with a suitable one.

6-5 Drilling Results - This item is not labeled correctly. The label shows this as item 5-5 instead of 6-5. The Operator shall replace this item with a correctly labeled one.

Exhibits 7-1 through 7-9 are found in Chapter 7 but are not found in the table of contents for Chapter 7. The Operator shall include these in the table of contents.

7-9 Letter From the U.S. Soil Conservation Service Concerning Alluvial Valley Floors in the Crandall Canyon Area - This is already included in Chapter 8 where it belongs. The Operator should remove this item from chapter 7.

8-4 Letter, Disposal of Oil Contaminated Soil - The text of this letter should be incorporated into the operation and reclamation plan in Chapter 3 and into the text of the Chapter 8. The response to the violation does not incorporate all of the information and commitments required for the mine plan and therefore this is not adequate.

10-3 Vegetation and Terrestrial Wildlife Report, included originally as item 9-1 - Pages 1 through 40 of this report are not included with the item. The Operator shall locate and reference these sections of the report located elsewhere in Chapter 10, or shall include those pages as part of item 10-3.

12-6 Slope Stability Investigation Portal Pad - Page 5 and Figure 7 of this report contain hand written comments from the edited draft copy of the MRP, these pages need to be replaced with clean copies.

12-7 Correspondence - This correspondence contains hand written comments from the edited draft copy of the MRP, those pages need to be replaced with clean copies.

12-8 Slope Stability-Access Road - This stability investigation does not contain the certification of a registered professional engineer. The Operator shall obtain such certification for approval of this report and include it in the MRP.

TABLES:

7-8 Extended surface water analysis list - The table of contents has mislabelled the table as 7-7. The table of contents should be corrected.

PLATES:

2-1 Permit Area Map - The permit area map indicates disturbed area boundaries outside of the permit area boundaries. The operator must include all disturbed areas within the permit area boundaries. In this case, it would appear that Genwal will have to request an increase in the USFS Special Use area in order to be in compliance. The facilities indicated on this drawing conflict with those given on other drawings throughout the mine plan. The Operator should revise and resubmit those drawings to coincide with each other. The drawing and the mine plan will have to be amended accordingly.

The outline of the surface facilities shown on Plate 2-1 does not correspond to the amended facilities such as those shown on Plate 7-3. All features on all maps should be updated to correspond with the currently proposed MRP.

3-1 Proposed Surface Facilities - This item does not have the disturbed area boundaries delineated or the acreages for the disturbed area. Portions of the drawing are shaded but no key or information was provided to indicate the purpose of the shading. The permit boundaries should be located on the drawing for reference. This item is not considered adequate.

3-3 Hiawatha Mine Plan - This item does not have PE Certification, does not show overburden contours through the Tract 2 area and is considered inadequate.

3-4 Proposed Surface Facilities, Cross Sections - The plan view drawing referred to in the key of the drawing could not be found in the plan. The Operator shall provide a plan view of the site showing where these sections were taken. The drawing does not have PE Certification. This item is not considered adequate.

3-5 Typical & Reclamation Reference Cross Section - This plate provides typical sections of the site but does not reference where the sections were taken with respect to a plan view of the site. The drawing also shows details of the upper portal pad which have been revised from the original plan. The Operator shall provide a plan view of the site showing where these sections were taken. This item is considered inadequate.

3-6 Plan & Profile Haul Road - This item does not have PE certification and is not considered adequate.

3-8 Contemporaneous and Final Reclamation Areas - This item was not found in the plan as Plate 3-8. The Operator shall provide the drawing which was included in the table of contents, but which was not found in Chapter 3.

3-9 Topsoil Cross Sections - Contemporaneous and Final Reclamation Areas - This item was not found in the plan as Plate 3-9. The Operator shall provide the drawing which was included in the table of contents, but which was not found in Chapter 3.

6-1 Geologic Map - This drawing shows the earlier version of the proposed surface facilities. This map must be changed to correlate to the specific facilities to be implemented for the operation.

6-2 Overburden and Coal Isopach - This drawing does not show the location or the relationship to the coal seam located in the overburden. This information must be included in order to make a determination for coal recovery. The Operator shall resubmit this drawing.

7-1 Crandall Creek Plan and Profile - This drawing is not listed in the table of contents for Chapter 7. Plate 7-1 has no grid or reference with which to tie the stream location into the permit area. The drawing does not indicate the date in which the aerial survey was flown. This item is considered inadequate and should be revised and resubmitted.

7-2 Crandall Creek Cross Sections - This drawing is not listed in the table of contents for Chapter 7. This Plate is also considered inadequate for the reasons given for Plate 7-1.

7-3 Boundaries of Undisturbed Watersheds Draining to the Crandall Canyon Mine Site - This drawing is not listed in the table of contents for Chapter 7. This item was found in the plan and is considered adequate.

7-4 Sedimentation Pond Details - This drawing is not listed in the table of contents for Chapter 7. Contour lines shown in this drawing do not correspond to those provided on other drawings provided in the mine plan. The Operator shall resurvey or determine which contours are in fact correct for the site and correct and revise the drawings accordingly.

9-4 Vegetation Map from Tract 2 - The facilities shown on this map conflict with the plan and other drawings. The operator shall resubmit this drawing with correct reference information. This item is considered inadequate.

.24(c) Boundaries and locations of all areas proposed to be affected throughout the life of the mine are inadequate. Several of the drawings and facility maps included in the plan conflict with respect to the location and extent of the disturbed area. The Operator is not in compliance with this Section and the plans are not adequate.

.24(d) A map of all buildings in and within 1000 feet of the proposed permit area has not been submitted by the applicant and must be submitted prior to technical review of the permit application package. A map must be provided showing the permit area boundary and a secondary boundary located a distance of 1000 feet outside the permit area boundary. All buildings and structures that are within this area shall be identified as required in the regulations.

UMC 783.25 Cross Sections, Maps and Plans - RS

a. The applicant must submit a map depicting the location and elevation of drill hole CH-2 and any other test borings and core samples in the mine plan adjacent area (i.e. Crandall Canyon).

i. The applicant must submit a map depicting the sumps proposed in Chapter XI (pgs. 6 & 8).

UMC 783.25 Cross Sections, Maps and Plans - DC/DD

The applicant must submit a comprehensive map that depicts all water monitoring (ground and surface stations and all rain gauge locations). Item VI-2 is not a coal and overburden isopach as stated on Page VI-3 but rather an acid-base accountability report. This discrepency must be clarified.

The applicant shall provide elevations and depth of test borings.

The applicant shall supply geologic cross sections that correlate information gathered from drill holes 1 and 2.

Submit cross sections depicting the thickness of all coal seams and lithofacies changes.

All map and cross sections must be approved by a registered professional engineer or professional geologist.

UMC 783.25 Cross-Sections, Maps, and Plans - JRH

.25(c) The Operator has not adequately delineated the nature, depth and thickness of the coal seams to be mined, any coal or rider seams above the seam to be mined, each stratum of the overburden, and the stratum immediately below the lowest coal seam to be mined. Details of the Hiawatha seam presented in the plan are adequate, however the information on the Blind canyon seam is not sufficient to determine adequacy or compliance with this Section. An isopach of the Blind Canyon seam should be included with the isopach of the Hiawatha seam. The Operator is not in compliance with this Section.

.25(e) The Operator has not provided the location and extent of known workings within the proposed mine plan and adjacent areas. The Operator should provide to the Division, a copy of the mine development progress maps which are required by MSHA to show the location and the extent of the current mine workings as close to the date of the MRP submittal as is available. The Operator shall delineate and clearly show the location and the extent of the previously mined workings, and the approximate dates in which the mining occured on the drawings. The Operator is not in compliance with this Section.

.25(i) The applicant has provided on Plate 3-1, the locations and dimensions of the surface facilities within the permit area. Conflicting information as to the location and extent of the facilities (pads, roads, embankments etc.) is found throughout the plan on other drawings contained within the plan. The Operator shall revise and replace all such drawings with conflicting information. The Operator is not in compliance with this Section due to conflicting information within the plan.

The Operator shall provide to the Division, on all maps and plans, true and correct contour and surface features. Map accuracy shall be in accordance with National Map Accuracy Standards. All maps shall be of an appropriate size and scale for their respective use so as to provide sufficient detail of such features and facilities.

.25(k) The applicant has not provided adequate information for technical review of the requirements under this section. Slope measurements as required under this section have been provided in the form of topographic maps and cross-sections. However, substantial discrepancies in contours and sections exist throughout the plan. For example, the contours provided near the sediment pond and through the stream channel notably differ between drawings 2-1,3-1 and 7-3. The Operator is not in compliance with this Section and shall provide to the Division, on all maps and plans, true and correct contour and surface features. Map accuracy shall be in accordance with National Map Accuracy Standards. All maps shall be of an appropriate size and scale for their respective use so as to provide sufficient detail.

UMC 784.12 Operation Plan: Existing Structures - JRH

Existing facilities from previous mining within the permit area boundaries are described in part 3.4.2 of the Operation and Reclamation Plan, which also refers to the archeological information contained in Chapter 5. The only portion of the previously existing facilities that are incorporated into the mining plan are the mine portals. The Operator should include a description of the nature and the condition of the portals that were incorporated into the mining plan and the measures to ensure that the performance standards, and that health and safety standard are (were) met during construction.

UMC 784.13 Reclamation Plan General Requirements - RS/JRH

.13(b)(1) The applicant's reclamation timetable (pg. III-38) must reflect the removal of the sedimentation system (i.e. sediment pond and associated diversions) after compliance with the requirements of UMC 817.46(u). See comments under UMC 784.14 for details required for this determination.

.13(b)(2) The Operator has provided a detailed cost estimate as Item 3-12 of the Operation and Reclamation Plan. However, the information provided in this estimate is outdated. The disturbed area, surface facilities, earthwork and configuration of the site upon reclamation deviate considerable from the information found in the cost estimate. The Operator must submit a

detailed cost estimate which reflects the proposed modifications and changes to the facilities since the original proposal. This Section is considered inadequate.

.13(b)(3) The maps, plans and cross sections required for the earthwork are not adequate to show the final configuration of the site. The Operator has not met the requirements of this section.

.13(b)(4) Due to conflicts of information regarding the disturbed area acreage and the configuration of the site, topsoil storage and redistribution requirements cannot be determined. The Operator is not in compliance with this section.

.13(b)(6) The description of the measures used to maximize the use and conservation of the coal reserves is not adequate. The operator has not provided sufficient information with regard to the potential coal reserves within the permit area. The Operator needs to provide more information with respect to the nature and reserves found in the Blind Canyon seam and justification for exclusion of this coal from production. The Operator comments in part 3.3.1.2 that if economics appear to be favorable to develop the Blind Canyon(upper seam), a combination of slopes and portals will be used. This indicates that the Blind Canyon seam may be considered mineable, and that the Operator will have to provide information regarding the protection of these reserves, or, justification for wasting the seam where the Hiawatha seam is mined and pillared below the Blind Canyon seam. See also comments under UMC 817.59.

.13(b)(7) The Operator includes in the Operation and Reclamation Plan in part 3.4.9, plans for waste disposal. These plans conflict with the conditions given by the Division concerning the disposal of sediment pond waste material. The Operator shall revise the waste disposal plans to be in compliance with the conditions of the September 23, 1985 letter from the Division to Genwal Coal Company. Other requirements or deficiencies in the waste disposal plan are found in the technical comments.

UMC 784.13(b)(5) Revegetation Plan - LK

Section 3.4.5.2 states that the entire area will be reclaimed. Please correct this to show that the road will remain as part of the postmining land use.

There are several references made in chapter III to a reclamation map (Plate 3-8). Please submit. This map is not currently in the plan.

Section 3.5.4.4 - How will regraded areas be treated to "eliminate slippage and promote root penetration?"

Seeding & Planting Plan

Section 3.5.5.2 has a seed mix identified for seeding the topsoil piles that was not in the original approved plan. Please replace this mix with what was originally approved, that being:

SPECIES	lbs. PLS/Acre
Agropyron smithii	4
Agropyron trachycaulum	4
Bromus marginatus	3
Elymus junceus	2
Melilotus officinalis	2

A statement on page III-34 indicates that areas not actively needed for operations will be seeded with the contemporaneous seed mix. Is this the same mix used for topsoil protection? If so, this needs to be made clear. On page III-33, it states that some areas of the slopes that are greater than 1:1 will be gouged to create small basins for shrub planting. What species will be used for this, and at what rate? Also, the total area where this will be done must be identified.

The applicant has identified the tree species to be planted on areas of less than 30% slopes. Will this be the entire "less than 30% slope" area? At what rate will each species be planted?

With regards to "wooded area" (see top of page III-34) will these species be seeded or planted? At what rate (lbs. PLS/acre or # plants/acre)? Why are there no forbs planned for this area? Also, what is the aerial extent (acreage) of this area? As suggested earlier, please make a seed/plant list for this area in table form, listing the species to be used and either the seeding rate as lbs. PLS/acre or the planting rate as # of plants/acre.

Concerning the tree planting plan how will the applicant plant 610 seedings/acre and not plant more than 100 trees of any 'one' species when only 5 tree species are on the list?

The last sentence in the second paragraph on page III-34 should be corrected to read "610 seedlings per acre. When considering a normal mortality, this would establish the required 90% of the USFS recommended density standard of 550 trees per acre."

The applicant has stated (middle of page III-34) that shrubs and trees would be randomly spread over the entire area rather than clumped. While its true that clumping will not give a uniform seed dispersal over the entire area it would enhance wildlife habitat at little or no additional cost. Also, one should not count on any significant increase in shrub density during the liability period from natural seeding from planted trees and shrubs. Please reconsider the clumping alternative as additional wildlife mitigation.

Please explain the statement on page III-35, "A plan for planting shrubs will be developed at a rate consistent with the revegetation standard." When will this plan be developed and implemented?

Mulching

On page III-33, the applicant states that slopes steeper than 1:1 will be mulched with burlap netting. This contradicts the plan on page III-30, to hydromulch, using 1 ton per acre of a wood fiber mulch. The use of burlap netting has not been successful in past reclamation in similar sites. Therefore, please eliminate the plan to use burlap netting as mulch.

Page III-30 lists several mechanical methods and the use of an emulsion as possible alternatives to anchor mulch (straw). Please be specific as to which method (or methods showing areas on the Reclamation Map) will be used.

Monitoring & Success Standards

The applicant intends to compare reclaimed areas to the original (vegetation) survey for vegetative compliance (Middle of page III-37). Please note, data from reclaimed areas must be compared with the data collected the same year from the reference area to determine vegetative compliance. The reclaimed area must meet the success criteria during years 9 and 10 of the liability period.

The applicant has proposed a standard for the riparian area (second to last paragraph on page III-37). This is a diversity standard and should be identified as such.

UMC 784.14 Reclamation Plan: Protection of the Hydrologic Balance - DC

The applicant must submit a plan of the measures to be taken to insure the protection of Crandall Creek during reclamation construction activities. The applicant must submit a plan for the collection, recording and reporting of ground and surface water quality and quantity data during and after reclamation of the minesite. This monitoring program should adhere to the DOGM Guidelines for the Establishment of Surface and Ground Water Monitoring Programs. The applicant must also include a plan that will demonstrate that the requirements of UMC 817.46(u) are met before removal of the sedimentation pond. The reclamation monitoring plan should include the following:

1. A map showing proposed sampling points including a point at the entrance of the sediment pond.

2. Sample frequency and parameter list.

3. Procedure of recording and reporting of sampling data (including dates of submittal of the results to DOGM).

4. Commitment and bond for sampling until requirements of UMC 817.46(u) are met.

UMC 784.16 Reclamation Plan: Ponds, Impoundments, Banks, Dams and Embankments - RS

.16(a)(1)(i) A certification statement by a registered professional engineer for the proposed sediment pond (including all calculations) must be submitted.

(ii) The sediment pond details presented on Plate 7-4 are not adequate. It is suggested that cross sections be enlarged in order to be more usable. Cross sections A-A' must depict the design water level elevation (10-year, 24-hour and 25-year, 24-hour event), the slopes of the outer embankment and the north embankment, and the surveyed elevation of the "natural embankment contact." Cross-section B-B' must depict design water elevations (10-year, 24-hour and 25-year, 24-hour event), elevation of spillway inlet, elevation of junction of spillway riser and barrel, and elevation of spillway outlet. See also the requirements of 30 CFR 77./216-2(a)(7).

.16(b)(2) The applicant has not addressed this requirement completely. The applicant must submit the information required under 30 CFR, 77.216-1 and 30 CFR 77.216-2. These requirements are enclosed for the applicant's reference. To facilitate the review the applicant should respond to each item in sequential order.

UMC 784.18 Relocation or Use of Public Roads - JRH

The mine haul road and facilities are on USFS properties. The Forest Service is working with the Operator concerning right of entry and special use permits. The Operator has committed to comply with the conditions of the Forest Service, therefore the Operator is in compliance with this section. As part of the mid-term review of the mine plan, the Operator shall obtain from the Forest Service, a comment letter indicating the performance and compliance with respect to the conditions originally addressed by the Forest Service.

UMC 784.22 Diversions - RS

The applicant has not adequately addressed this section. See Comments under UMC 817.43 and UMC 817.44 of this document.

UMC 784.23 Operation Plan: Maps and Plans - JRH

.23(a) The maps and plans submitted by the Operator do not clearly show, conflict with the text in the plan, or conflict with other drawings within the plan with regard to facilities or features in the proposed operations. The Operation is not in compliance with this Section and the submittal is not considered adequate.

.23(b) (2) The Operator has not provided a map of the area to be affected with respect to the proposed modifications and changes found in the mine plan.

(3) The Operator has not provided a map delineating the area of land for which bond will be posted.

(8) No drawings of such proposed facilities for the protection of fish and wildlife are found within the proposal.

(9) The locations for explosives storage and handling facilities can not be found on Plate 3-1. The operator currently has surface explosives storage

facilities and must show the location of the existing or the proposed locations for explosives storage and handling facilities.

(13) No facilities are expected to remain on the site as a permanent feature, however, the Operator shall provide a post reclamation map showing the final contours of the disturbed areas.

.23(c) Refer to comments made for each drawing under UMC 783.24 regarding certification of drawings.

UMC 784.23 Operation Plan: Maps and Plans - RS

.23(b)(6) The applicant must submit maps, plans and cross-sections for the proposed in-mine sumps. See also comments under UMC 784.16, 817.43, 817.44 & 817.49 of this document.

UMC 784.24 (a) Transportation Facilities - RS

.24(a) The applicant must submit designs and plans for all road culverts and drainage ditches for the road on the permit area. Page III-8, section 3.2.10, states that the road in the permit area is a Class III road . The Division has made a determination that the road is a Class I road and therefore plans, maps, cross-sections and designs (w/assumptions) must be presented demonstrating compliance with UMC 817.151(d), 817.152(c)(3) through (c)(15), 817.153, and 817.156(a)(2), (5), (7). The Division has determined that the roads to the office facilities and upper portal pad are Class II roads and must comply with UMC 817.160 and 817.166. The road to the substation is a Class III road and plans must be submitted to address UMC 817.170-.176. Details are referenced to on page 53, Chapter 3, Section 203.07 and 203.13 but are not found. The applicant must reference specific drawing numbers.

.24(d) The applicant has not addressed this section. The applicant must submit plans for headwall protection for all proposed road culverts on the permit area.

UMC 784.24 Transportation Facilities - JRH

.24(a) Item 12-8 is the slope stability analysis for the coal mine access road. This item does not have the certification of a P.E. The Operator must include certification on all applicable maps, plans, designs and reports pertaining to stability analysis and water impounding structures as required.

Part 12.5 of the mine plan states, "No surface structures are required for Tract II. All earthen surface structure stability is addressed in the original Tract I permit proposal." This and other sections of the mine plan contain conflicting information included from various plans and submittals to the Division. The idea of the mid-term review is to consolidate the information submitted by the Operator and eliminate conflicting information. The Operator shall correct such conflicting information and present the plan in consolidated and coherent manner prior to the plan being determined either adequate or complete.

.24(b) Refer to comments under UMC 817.150-.176.

.24(c) Refer to comments under UMC 817.150-.176.

.24(d) Refer to comments under UMC 817.150-.176.

UMC 784.25 Return of Coal Processing Waste to Abandoned Underground Workings -JRH

This Section applies under UMC 817.71(m), refer to comments made under that Section.

TECHNICAL DEFICIENCIES

UMC 805 Amount and Duration of Performance Bond - JRH

The Operator's information regarding bond cost estimates for reclamation is not adequate. The information found in the plan is from the original submittal and does not reflect the changes or revisions in the plan that have occurred since then.

The Operator must supply sufficient information in order for the Division to determine adequacy of the bond. Such information required shall include estimated quantities for earthwork and unit quantities for other activities, calculations for selection of equipment and productivity, and manpower selection and cost estimates. The Division uses Blue Book Rental Rates for estimation of equipment rental and operating costs and the Means Site Work Cost Data book to determine labor costs. Items such as revegetation costs and portal closures are determined from vendors and contractors in the area. Additionally, the Division shall allow for contingency and inflation when final bond estimates are considered. The applicant shall provide sufficient information for completeness of their bond estimate in order to determine technical adequacy of the plan.

UMC 817.13-.15 Casing and Sealing of Exposed Underground Openings - JRH

The Operator has indicated in part 3.5.3 that exposed underground openings will be closed either temporarily or permanently as required by this Section. However the details and plans for permanently casing and sealing the openings are not sufficient to determine this Section as technically adequate.

The Operator needs to provide drawings and sections of the mine openings to show their existing configuration and the expected final disposition of the portals after sealing. These details will also show the final configuration of the portal bench highwall. This information will be used to determine the cost of sealing the mine openings and highwall reduction, and adequacy of the method of closure under this Section.

UMC 817.22 Topsoil: Removal - JSL

As pursuant to UMC 783.21, the total depth of topsoil and subsoil removal must be clarified. The operator states that the topsoil will be removed in one lift, but the lift depth is undefined. The operator must commit to a removal depth. The operator has committed to monitor the topsoil/subsoil removal operation. What monitoring techniques will be utilized?

UMC 817.23 Topsoil: Storage - JSL

The applicant states that the substitute topsoil will be placed adjacent to the topsoil stockpile "as shown on Plate 3-1." Plate 3-1 only displays a stockpile location. It does not identify the two individual soil materials or their corresponding volumes. Each soil material must be distinguished. The operator has not submitted any short term topsoil/substitute topsoil information. Where will this stockpile be located during the pads final grading? This location must be delineated on the surface map. Will the two soil materials (i.e. topsoil and substitute topsoil) be stockpiled separately? What protective measures will be employed? Will the short term stockpile site be located off the permit area? The applicant must define the location of the previously salvaged topsoil in a narrative and graphic form. The narrative must include: A) stockpile identification, B) volume, C) location, D) protective measures against erosion, E) time of potential redistribution and F) redistribution plan. Graphs should include: A) location, B) cross sections and C) volumes.

The cross-sectional views of the topsoil and subsoil stockpile, plate 3-9, was not submitted. Please amend. As shown on Plate 3-1, the topsoil cross-section E - E' delineates the topsoil stockpile going under the pad surface, thereby being buried. This is not permissible. All topsoil and substitute topsoil must be stockpiled on the surface.

UMC 817.24 Topsoil: Redistribution - JSL

The operator has not submitted the postmining topography map. Plate 3-8. A postmining topography map shall be submitted. On page VIII-8 the operator commits to treat the area of disturbance to "lessen the chance of slippage and promote root growth." Define the applicable treatment. The operator also commits to a "monitoring system" to ensure the even distribution of topsoil. The operator shall submit an explicit narrative of the monitoring system.

UMC 817.25 Topsoil: Nutrients and Soil Amendments - JSL

The second sentence of Part 8.5, page VIII-4, Volume II of the permit application leads one to believe that if required, the soils will be tested prior to redistribution. Testing the soil is required prior to redistribution. Applying nutrients to the topsoil stockpile is unacceptable prior to redistribution. All nutrients and amendments must be incorporated after redistribution. How will the nutrients be placed (i.e. broadcast, till, etc)? What equipment will be used to distribute the fertilizer? The Division recommends that one ton of alfalfa be incorporated into the redistributed topsoil and substitute topsoil for increased fertility and physical structure enhancement.

UMC 817.41 Hydrologic Balance: General Requirements - DC/RS

The applicant states in Section 3.5.1 that all surface areas which are disturbed during the construction phase and will not be needed for mining operations will be revegetated. The Division feels that the area proposed for public parking across from the coal loadout should be reclaimed and revegetated. Since this area is being abandoned by Genwal as a part of the surface facility for mining operations this area should be reclaimed.

GENERAL

The following comments pertain to hydrology in a general nature and deficiencies found in the MRP.

1. Page III-6, Section 3.2.3. What is the size of berm to be placed around the fuel tanks?

2. Page III-8, Section 3.2.10. The applicant states the road to the upper pad will have limited maintenance, the applicant must have a regular program of maintenance which will minimize and correct erosion problems before they become extensive.

3. The applicant is requested to reclaim the area across from the coal stockpile if the area is no longer needed for operations or submit a letter from the USFS accepting responsibility for this area. Regardless, drainage from this area must be routed to and treated at the sediment pond.

4. Page III-15, section 3.3.9.2. The applicant states that solid waste will be disposed of at a state approved landfill. The proposed landfill should be specifically identified in the MRP.

5. Page III-18, Section 3.4.3.1. The applicant states a copy of the ownership of water rights is included in Chapter 7. The material could not be found in that Chapter.

6. Page III-21, Section 3.4.6.2. The applicant states monitoring will be conducted according to previously submitted ground and surface water monitoring plans . These plans should be included in the MRP.

7. Page III-22, Section 3.4.7. The size of berm around the diesel storage tank should be stated.

8. Page III-23, Section 3.4.9. The applicant states delay from DOGM approval could interfere with operations (relative to disposal of development waste). Perhaps then it would be advisable to propose a contingency disposal area, at this time and not risk interfering with the applicants operation in the future.

9. Page III-27, Section 3.5.3.2. The applicant states that the only facility to remain intact following reclamation will be the sediment pond. This should read sedimentation system and include all necessary diversions required to insure routing of all disturbed area drainage to the pond and diversions required to maintain the integrity of the pond.

10. Page III-38, Section 3.5.6.1. A reclamation map must be submitted depicting this system. This section should reflect the proposal to leave the sedimentation system intact at the site until the requirements of UMC 817.46(u) are met.

11. Page IV-2, Section 4.3.1.4. The applicant states that a special use permit will have to be obtained from the USFS for surface facilities adjacent to the permit area. This permit must be obtained and included in the MRP Chapter 8, 10-8-85 letter, item #8. Genwal must obtain and submit a letter from the USFS agreeing with this concept.

12. Chapter 11, Page 4. The applicant states in paragraph 3 that two sediment ponds will be implemented at the site and have a capacity to contain the 100-year storm event. This conflicts with other sections in the MRP. The applicant should correct this discrepancy.

13. Chapter 11, Page 12-15. The applicant states that two Class II roads are proposed for the site. This conflicts with other information (albeit incorrect) in the MRP that states all roads are Class III. See comments under 784.25 for required clarification.

14. Chapter 12, Table of Contents. The applicant has not included page numbers for this table.

15. Chapter 12, Page 6, Delta Engineering report. Design details for the recommended diversions and culverts discussed on this page must be submitted.

16. Chapter 12, October 3, 1985 letter. The applicant states SP-30 will be monitored as described on Page VII-22. The page number reference is incorrect, VII-22 does not discuss any such monitoring.

17. Chapter 12, R & M Report, last page. The applicant should submit design details for the diversion. (10-year, 24-hour event).

UMC 817.42 Hydrologic Balance: Water Quality Standards and Effluent Limitations - DC

The Division has determined that the upper pad area (power substation pad) must meet the requirements of UMC 817.42 (3) as a small area exemption. Since this area is disturbed and runoff will not be diverted to a treatment facility the applicant must request a small area exemption for this area.

The Division feels that a method of treatment for runoff from the highwall area behind the power substation pad should be included in the runoff and sediment control plan. The Division recommends constructing a stilling basin in the undisturbed diversion at the junction of the upper pad diversion channel and the head of the undisturbed diversion channel above the main pad area.

UMC 817.43 Hydrologic Balance: Diversions and Conveyance of Overland Flow, Shallow Groundwater Flow and Ephemeral Streams - RS

The following comments must be addressed by the applicant.

1. The applicant has provided design information for three diversions (WS-1, WS-2, and WS-4 combined, WS-3 and WS-4) at the site. The applicant must delineate the proposed diversions with a separate label on Plate 3-1. The location and proposed extent of each diversion must be clear. Reference in the Appendix should refer to a specific Plate or map and not simply "see site map."

   Cross-sections drawn to scale (UMC 784.22 and 784.23 (b)(6)) must be submitted for these diversions. It is requested that the cross section for diversion WS-1, WS-2 and WS-4 be drawn to include the existing upslope for a horizontal distance of 8 to 10 feet.

2. The applicant has not submitted designs for the remaining diversions noted below. The diversions were summarized from Plate 3-1 and may not be inclusive of all diversions planned or required at the site. The applicant must submit plans for each diversion including peak flow value with assumptions, calculated velocities and required channel lining location of diversion (with distinct label), typical

cross-sections depicting flow depth and channel geometry. The applicant may use a worst case flow value and diversion design for all diversions onsite if the information provided demonstrates all other diversions are conservative (i.e. diversion slopes depicted and drainage area apparent).

The Diversions are:

a. Behind the bathhouse and office warehouse.
b. Access road to substation pad.
c. Access road to portal pad.
d. Diversion from access road to stockpile area.
e. Diversion south of loadout and north of USFS road.
f. Diversion above truck turnaround.
g. Diversion into sediment pond (see plate 7-4).

3. Plate 3-1 depicts two culverts from the portal pad to the sediment pond. No designs or details have been submitted for these culverts. Please submit.

4. Based on on observations onsite by Division staff, concern has been raised relative to the grade and drainage near the existing 24" CMP north of the sediment pond. Disturbed area drainage has been reported to bypass the sediment pond and flow down the access road. The applicant must propose measures to correct this problem. Alternatives to consider are installing a slotted drain, rolling dip or regrading to insure free drainage to the pond.

UMC 817.44 Hydrologic Balance: Stream Channel Diversions - DC

The applicant must submit a watershed map for the Crandall Creek flood flow calculations on page 1 of Appendix 7-5. The Division feels that the SCS Type II rainfall distribution is more representative for a storm duration of 24 hours than the SCS Type B distribution. Therefore, the peak flow for the 100-year, 24-hour precipitation event should be calculated using the SCS Type II distribution. The applicant must reference the slope determination on page 7 of Appendix 7-5. The channel cross section of Crandall Creek on Page 8 of Appendix 7-5 needs to be certified by a professional engineer. Additionally, the applicant must submit reclamation plans for Crandall Creek in the vicinity of the sedimentation pond after removal of the pond.

UMC 817.46 Hydrologic Balance: Sedimentation Ponds - RS

.46(b) The areas referenced to on page 1 of Appendix 7-4 must be delineated on a site map. Plate 3-1 depicts areas within the site that are shaded but not labeled. Is this the area referred to as undisturbed or reclaimed on Page 1? The

applicant is referred to UMC 817.42 (a)(2) which states that all disturbed area drainage, "including disturbed areas that have been graded, seeded or planted shall be passed through a sedimentation pond or a treatment facility before leaving the permit area." The applicant must insure and clearly depict that all areas drain to the pond.

The applicant must delineate on Plate 3-1 the boundaries of the disturbed area, the undisturbed area and reclaimed areas. This area must include the sediment pond and embankment area, the access road to the northeast of the sediment pond, and the area where the current surface facilities are located. There exist several discrepancies in the plan concerning the extent of the disturbed area. The applicant must insure the disturbed area corresponds to the boundary drawn on Plate 3-1 and is consistent throughout the plan. Additionally, the applicant must insure that the drainage controls that define the boundaries are depicted on Plate 3-1 and labeled (i.e. berms and diversions). The Division requests that a predicted sediment volume for reclaimed areas be included in the pond design as sediment contribution will be considerable from these areas until fully reclaimed and stabilized (i.e. a period of 3-10 years).

.46(c) The applicant is requested to delineate on Plate 3-1 each subwatershed used to conduct the calculations on pages 6-10 of Appendix 7-1. The applicant must submit a narrative discussing the Sedimot II output included on Appendix 7-1. Concern is raised over the following results of the output:

1. The predicted sediment and settable solids concentrations.
2. The predicted detention times.

The applicant must state if the proposed sediment pond volumes discussed are with the 12" clay liner and 18" cobble marker in place. If not, the applicant must account for these volumes in the design.

.46(e) The decant discussed on page 11 of Appendix 7-1 needs more detail. What type of decant is proposed? What is the operating procedure for the decant? How doe the decant affect detention time?

.46(h) The applicant must propose a sediment marker in the pond to delineate the elevation at which the sediment pond requires sediment removal. Location of the stake should be depicted on Plate 7-1. The stake should be located midway between the inflow and outflow points of the pond. The riser

detail on Plate 7-1 shows the oil-skimmer to be non-functional (the inlet is located below the 18" cobblestone marker). Please clarify this situation. Additionally what elevation was used to develop the discharge relationships (the elevation of the 36" collar or the elevation of the 24" riser)?

.46(i) The applicant must submit plans showing that the emergency spillway is capable of discharging the required event from the sediment pond crest to Crandall Creek. A spillway only at the crest (Plate 7-1) is not sufficient as drainage is being routed to an undefined channel and erosion is highly probable when flow is routed to an area that has not been developed to handle such flows.

.46(r) The applicant must commit to submitting the certification required under this subsection and 817.49(h)(1-5) by July 31, 1986.

.46(t) The applicant must commit to conducting the inspection of the sediment pond embankment as required by this subsection. The Division hereby grants approval for quarterly inspections until such time that weekly (30 CFR 77.216-3) inspections may be required. The applicant must commit to submitting the reports required by 30 CFR 77.216-3 (enclosed for reference) to the Division including dates of submittal. The applicant is additionally requested to submit a copy of the information required by subsections (c) and (e) of 30 CFR 77.216-3. The applicant must also state where the records of inspections required by subsection (c) will be located at the minesite.

UMC 817.46 Hydrologic Balance: Sedimentation Ponds - JRH

.46(m) Variance from the combined upstream and downstream side slopes of the embankment of less the 1v:5h is requested by the Operator. Design of slopes are to be stable in all cases in order to accept a variance from this Section. The Operator has not provided sufficient design information to determine this Section technically adequate.

The Operator provides no information in their submittal that the fill materials shall be compacted. More specific details as to the requirements of the compaction should be proposed and committed to in the design and construction of compacted fills, including the maximum height of each lift to be compacted, the type and specifications for the equipment used, and the relative density that is to be obtained through compaction.

The Division requires a static safety factor of 1.5 and a seismic safety factor of 1.1 before a variance to side slope requirements can be granted. This requirement is especially emphasized due to the environmentally sensitive location of the proposed pond. A new geotechnical analysis of the proposed pond must be conducted and submitted. Analysis must be based on samples from the existing embankment, underlying natural material and the expected fill material. The analysis must assume empty and full pond conditions. A pezometric line from the water elevation at design depth to the toe of the slope must be determined for both full and empty pond conditions. Information obtained from the installation of the piezometer must also be incorporated into the design.

UMC 817.47 Hydrologic Balance: Discharge Structures - RS

The applicant has not completely addressed this section. Plates 7-1 and 3-1 depict the following energy dissipators for which complete plans have not been submitted.

1. Discharge point from primary spillway.

2. Discharge point at Crandall Creek for diversion for WS-1, WS-2, and WS-4.

3. Discharge point of the 18" CMP located at the bottom of the access road to the portal pad.

4. Discharge point of the 24" CMP located northeast of the sediment pond.

Additional discharge points that require energy dissipators apparent from the above two plates are as follows:

1. The two unlabeled culverts from the portal pad to the access road and sediment pond (Plate 3-1).

2. Discharge point at the emergency spillway outlet and Crandall Creek.

The only designs included for these dissipators are found in page 9/13 of Appendix 7-1. How was this information determined? The applicant must insure the following designs and calculations (including inputs) are submitted for each dissipator:

1. The exit velocity of discharge

2. Proposed riprap size with filter blanket.

3. Exact dimensions and extent of dissipator.

4. Expected velocities off the dissipator.

5. Construction maps.

UMC 817.49 Hydrologic Balance: Permanent and Temporary Impoundments - RPS

.49(c) The applicant should propose protection measures for the excavated north sideslope of the sediment pond.

.49(h) The applicant must address each subsection of this regulation, and commit to the required certification statement.

UMC 817.49 Hydrologic Balance: Permanent and Temporary Impoundments - JRH

.49(c) Excavations that will impound water during or after the mining operations shall have perimeter slopes that are stable and shall not be steeper than 2v:1h. Where surface runoff enters the impoundment area, the side slopes shall be protected against erosion.

The operator has provided a slope stability analysis of the sediment pond. It is apparent that the slope stability of the structure is marginal with respect to the requirements set forth in the regulations and those requirements of the U.S. Forest Service. Additionally, based on field observations of the existing sediment pond, it is questionable as to whether or not the structure can be constructed as per the specifications and drawings presented in mine plan.

To obtain approval for the sediment pond structure, additional information will have to be provided to the Division. A detailed contour map and sections of the area where the sediment pond will be constructed must be provided to ensure that necessary physical constraints of the design are met. If the physical size of the pond and the embankment change through revisions and modifications to the surface facilities or hydrologic criteria, re-evaluation of the pond size and location may be necessary. The Division and The Forest Service concur that Genwal may want to consider the possibility of using culverts to protect Crandall Creek to reduce slopes or meet the physical constraints of the sediment pond location.

Groundwater that may be present in the contact between bedrock and the soil beneath the sediment pond may cause stability problems with the embankment regardless of the effectiveness of the clay liner.

Unless stability design for the sediment pond can be established with a static factor of safety of 1.5 or greater under saturated conditions, monitoring will have to be established to ensure stability. Such monitoring may have to include piezometers. If the phreatic line of the embankment rises to the point where the static factor of safety is less than 1.5, the operator would have to develop and follow a mitigation plan to regain the required factor of safety.

If the pond design and construction are modified such that the pond can meet design stability requirements of 1.5 and 1.1 factors of safety for static and seismic conditions respectively while under saturated conditions, installation of piezometers will not be required for the embankment.

The operator did not include designs for channel protection of Crandall Creek. As previously mentioned, this protection may be in the form of culverts, or may be as initially proposed using riprap armor where the disturbed area encroaches on the stream channel. This protection must be designed for the 100-year, 24-hour event.

Additionally, with respect to slope stability, more specific details of the stream channel embankments along the outslopes of the sediment pond, roads and pads must be provided. The soil parameters used in the analysis were changed from a cohesion less soil to a cohesive type material. No soil analysis or sampling results are included with the design. Based on the nature of the soils in the area as being cohesion less, with an internal angle of friction of 35 degrees as shown in the data provided by the sediment pond analysis, it is apparent that some of these slopes will be unstable based on their current layout and design. All applicable requirements for insuring a static factor of safety of 1.5 and protecting the hydrologic balance of the surrounding terrain as specified in the regulations shall be met.

The operator must provide sufficiently detailed maps and plans to show the slopes and configuration of all earthwork accomplished on the site and include the stability analysis for those areas which are not within the acceptable limits for slopes as they apply within the regulations.

The plans and modifications provided are not adequate to meet the requirements for sediment pond design, stream channel design and slope stability as required in the Regulations. The operator must develop revised plans for the sediment pond design so that the structure meets the requirements of the regulations. Protection of the stream channel with riprap material (bottom and both sides) may be considered in conjunction with diversion of the stream channel similar to that currently proposed by the operator. A more suitable alternative to riprap may be the installation of a culvert in the stream channel and backfill over the culvert to the extent as required. In either case the stream channel must be designed to pass the 100-year, 24-hour precipitation event.

UMC 817.52 Hydrologic Balance: Surface and Ground Water Monitoring - DC

The applicant must state when the proposed surface and ground water monitoring programs will commence. The applicant must also submit monitoring programs for surface and ground water during and after reclamation of the minesite.

UMC 817.57 Hydrologic Balance: Stream Buffer Zones - DC

The applicant must submit a plan for sediment control during construction activities of the new surface facilities. The Division feels sediment control should occur before sediment enters Crandall Creek. Strawbales or other sediment control measures should be placed along the entire perimeter of the disturbed area and be designed so sediment will be trapped before entering the Creek. Additionally, the area that is currently being used for the trailer and generator should be reclaimed with a natural riparian vegetation in order to create a buffer zone between mining operations and Crandall Creek.

UMC 817.59 Coal Recovery - DD

The applicant shall submit the complete plans and calculations for coal recovery along with an approval letter from the U. S. Geological Survey.

UMC 817.61-.68 Use of Explosives - JRH

The Operator's commitment to comply with the Federal and State regulations pertaining to surface blasting activities incidental to underground mining operations is not technically adequate. The Operator must submit plans which meet the requirements included in the regulations. The Operator should also indicate that there are no dwellings or structures within one-half mile of the blasting activity if there are no such features, and that there is no public

concern or conflict with the public interest for the surface blasting that will occur on the site if this is the case. Approval shall also be obtained from the Forest Service with respect to surface blasting indicating acceptability of the plans and procedures to be used during surface blasting.

Plate 3-1 of the mine plan does not include the location of the explosives to be stored on the surface as indicated by the Operator in part 3.3.5.4. The Operator shall include such facilities on the drawings of the operation plan and provide for the removal of such facilities in the reclamation plan.

UMC 817.71-.74 Disposal of Underground Development Waste and Excess Spoil and Non-Acid and Nontoxic-Forming Coal Processing Waste - JRH

The Operator may return mine development waste and excess spoil to underground workings if the Operator is in accordance with UMC 784.25 and a plan is approved by the Division and MSHA. If the waste rock is to be gobbed underground the applicant must formulate a plan for backfilling and shall be in accordance with State UMC 784.19, UMC 784.25 and Federal 30 CFR regulations. Such plans shall be submitted to and approved by MSHA as part of the operation plan for the mine. The Operator has not provided in the mine plan, a design proposal and approval by MSHA for the proposal.

Under the general requirements for the disposal of excess spoil and underground development waste, the Operator must show that any leachate from the material will not degrade surface or ground waters or exceed the effluent limitations of Section UMC 817.42. The Operator has not provided this information.

UMC 817.89 Disposal of Non-Coal Wastes - JRH

The Operator has accounted for the disposal of noncoal waste including timber, oil and grease, trash, debris, and toxic materials generated at the site. A description of these plans is found in part 3.4.9 of the mine plan.

The Operator indicates that the designated location for the onsite waste storage facilities is included as Item 3-1. This information is actually found on Plate 3-1. The Operator should correct the reference error.

The Operator includes a letter from the Department of Health regarding the disposal of sediment pond sludge in the Sinbad Construction landfill. This letter satisfies the condition that no liquid waste material may be disposed of in the landfill. However, this does not meet the requirement of the Division that the sediment pond sludge is to be treated under the same conditions as coal spoils and coal processing waste.

Disposal of the sediment pond material must be provided for within the permit area boundary as required under UMC 817.71(a). Until the Operator includes in the plan a method for disposal of the sediment pond sludge within the permit area, this Section will be determined technically inadequate. The Conditions found within the letters dated September 23, 1985, and October 24, 1985, included in the mine plan as Items 3-9, must be met for approval. Conditional approval for the off site disposal to the landfill was a temporary and singular approval. The Operator must develop permanent operation and reclamation plans to handle these materials.

UMC 817.91-.93 Coal Processing Waste - JRH

The Operator has stated in part 3.4.9 of the mine plan that no coal processing facilities will be used at the mining facility in Crandall Canyon. This Section does not apply except where such conditions are required for return of mine spoils to underground workings and/or the treatment and handling of sediment pond sludge. Determination of technical adequacy will be made upon submittal of information regarding the above.

UMC 817.97 Protection of Fish, Wildlife & Related Environmental Values - LK

Part of the mitigation plan for the Tract II lease included an employee education and awareness plan, utilizing a film prepared by the Utah Division of Wildlife Resources. This mitigation is appropriate for, and should be included as part of the overall mine plan. Please add this to the wildlife mitigation section.

UMC 817.99 Slides and Other Damage - JRH

The Operator has not provided a commitment in the mine plan to notify the Division at any time a slide or other damage occurs which may have potential adverse effects as specified under this Section. The Operator shall include in the plan such a commitment. This section is not considered to be technically adequate.

UMC 817.101 Backfilling and Grading: General Requirements - JRH

The Operator has not provided sufficient information to technically determine that the conditions and the requirements of this Section are met. The Operator shall submit plans and drawings for the backfilling and grading requirements of the site which address the conditions of this Section.

UMC 817.103 Backfilling and Grading: Covering Coal and Acid and Toxic Forming Materials - JSL

On page VIII-4, the operator states that the "...proposal has not identified the presence of acid- or toxic-forming materials that would warrant the protective measures required by section UMC 817.48, nor have such materials been encountered at other coal mines in the region." This statement is erroneous. How does a "proposal" identify? What information was applied to develop the conclusion that there is no acid- or toxic-forming material at other mines? Please submit the data used to formulate your theory. On what data is the operator basing the conclusion that the Genwal coal mine has no acid- or toxic-forming materials? Item VI-2 does not include coal as a sample. Sampling of the coal seam must occur prior to any hypothetical judgment. According to the data in Item VI-2, sample 5605 (sandstone) and 5607 (mudstone) have acid-base potentials less than 5 tons $CaCO_3$/1000 tons material. These two sample are classified as acidic- and toxic-forming materials. The low acid-base potential indicates that the adjacent coal material may also be acid- or toxic-forming. The coal resource must have an acid-base potential analysis prior to a permit approval. The coal resource must be sampled in the roof, mid section and floor of the coal seam. The applicant must commit to an acid-base potential analysis of the soil material underlying the coal stockpile if the sampled coal proves to be an acid- or toxic-forming material. A minimum of three potentially contaminated soil sample sites, at six inch depth intervals to a two foot depth must be incorporated into the reclamation plan. This analytical data must be submitted to the Division prior to soil redistribution.

UMC 817.131 - .132 Cessation of Operations - SCL

The applicant does not address the entirely of those regulations, only the sealing of portals. The applicant must commit in Part 2.6 of the application to comply with the requirements of these regulations.

UMC 817.150-.176 Roads - JRH

The Operator has provided a description of the roads in part 3.2.10 of the mine plan. The Operator has incorrectly classified the roads on the site. Referring to the definitions for roads in the regulations; Class I Road means a road that is utilized for transportation of coal; Class II Road means any road, other than a Class I Road, planned to be used over a 6 month period or longer; Class III Road means any road, other than a Class I Road, planned to be used over a period of less than 6 months, or very infrequently over the life of the mine. By these definitions, Class I Road designation should be given to the main road on the site up to and including the truck turnaround. All other roads on the site should

be considered as Class II Roads with the possible exception of the access road to the substation. The Operator shall reclassify and comply with the requirements for roads under this Section.

Roads to be constructed and or maintained by the operator must be described in detail in the mine plan. Such details shall include road profiles, culvert and drainage design, and primary function of each road.

The Operator has not provided sufficient information to determine the mine plan technically adequate. Information required to determine this Section complete includes Design and construction, drainage, surfacing, maintenance and restoration details for the roads.

UMC 817.180 Other Transportation Facilities - JRH

This Section is considered technically incomplete. In correspondence with the Department of Health provided by the Operator as Item XI-1, condition 4 of that letter states that, "All conveyors shall be covered and equipped with water sprays which shall be operated as dry conditions and materials moisture warrant or as determined necessary by the Executive Secretary." The conveyor from the portal to the surface storage stockpile is not covered as is required under this condition. The Operator shall obtain approval from the Department of Heath to leave the conveyor uncovered or shall submit and implement a plan to cover the conveyor as required.

The Operator shall also include in the plan, procedures for the removal of those facilities and the disposition of waste or other materials generated from the removal.

UMC 817.181 Support Facilities and Utility Installations - JRH

The applicant shall address the requirements as contained in this section of the regulations. Commitments to protection of the environment should be considered and made in the application. Such items would include the use of raptor proof power lines, and erosion control methods used to prevent surface erosion and siltation in and around support facilities and surface utilities.

The Operator shall include a description as to the disposition of the support facilities and utility installations during reclamation construction. This should account for the disposal of waste materials generated from the removal of the facilities, removal of concrete and foundations and the removal of machinery and equipment from the site.

The applicant shall also indicate whether or not any utility installations as described in part (b) of this section currently exist or are planned as part of the mining plan.

[40 FR 41776, Sept. 9, 1975]

§ 77.216–1 Water, sediment or slurry impoundments and impounding structures; identification.

A permanent identification marker, at least six feet high and showing the identification number of the impounding structure as assigned by the District Manager, the name associated with the impounding structure and name of the person owning, operating, or controlling the structure, shall be located on or immediately adjacent to each water, sediment or slurry impounding structure within the time specified in paragraph (a) or (b) of this section as applicable.

(a) For existing water, sediment or slurry impounding structures, markers shall be placed before May 1, 1976.

(b) For new or proposed water, sediment, or slurry impounding structures, markers shall be placed within 30 days from the start of construction.

(Secs. 101, 508, Pub. L. 91-173, 83 Stat. 745, 803 (30 U.S.C. 811, 957))

[40 FR 41777, Sept. 9, 1975]

§ 77.216–2 Water, sediment, or slurry impoundments and impounding structures; *minimum plan requirements;* changes or modifications; certification.

(a) The plan specified in § 77.216, shall contain as a minimum the following information:

(1) The name and address of the persons owning, operating or controlling the impoundment or impounding structure; the name associated with the impoundment or impounding structure; the identification number of the impounding structure as assigned by the District Manager; and the identification number of the mine or preparation plant as assigned by MSHA.

(2) The location of the structure indicated on the most recent USGS 7½ minute or 15 minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available.

(3) A statement of the purpose for which the structure is or will be used.

(4) The name and size in acres of the watershed affecting the impoundment.

(5) A description of the physical and engineering properties of the founda-

tion materials on which the structure is or will be constructed.

(6) A statement of the type, size, range, and physical and engineering properties of the materials used, or to be used, in constructing each zone or stage of the impounding structure; the method of site preparation and construction of each zone; the approximate dates of construction of the structure and each successive stage; and for existing structures, such history of construction as may be available, and any record or knowledge of structural instability.

(7) At a scale not to exceed 1 inch=100 feet, detailed dimensional drawings of the impounding structure including a plan view and cross sections of the length and width of the impounding structure, showing all zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the measurement of the minimum vertical distance between the crest of the impounding structure and the reservoir surface at present and under design storm conditions, sediment or slurry level, water level and other information pertinent to the impoundment itself, including any identifiable natural or manmade features which could affect operation of the impoundment.

(8) A description of the type and purpose of existing or proposed instrumentation.

(9) Graphs showing area-capacity curves.

(10) A statement of the runoff attributable to the probable maximum precipitation of 6-hour duration and the calculations used in determining such runoff.

(11) A statement of the runoff attributable to the storm for which the structure is designed and the calculations used in determining such runoff.

(12) A description of the spillway and diversion design features and capacities and calculations used in their determination.

(13) The computed minimum factor of safety range for the slope stability of the impounding structure including methods and calculations used to determine each factor of safety.

(14) The locations of surface and underground coal mine workings including the depth and extent of such workings within the area 500 feet around the perimeter, shown at a scale not to exceed one inch=500 feet.

(15) Provisions for construction surveillance, maintenance, and repair of the impounding structure.

(16) General provisions for abandonment.

(17) A certification by a registered engineer that the design of the impounding structure is in accordance with current, prudent engineering practices for the maximum volume of water, sediment, or slurry which can be impounded therein and for the passage of runoff from the designed storm which exceeds the capacity of the impoundment; or, in lieu of the certification, a report indicating what additional investigations, analyses, or improvement work are necessary before such a certification can be made, including what provisions have been made to carry out such work in addition to a schedule for completion of such work.

(18) Such other information pertaining to the stability of the impoundment and impounding structure which may be required by the District Manager.

(b) Any changes or modifications to plans for water, sediment, or slurry impoundments or impounding structures shall be approved by the District Manager prior to the initiation of such changes or modifications.

(Secs. 101, 508, Pub. L. 91-173, 83 Stat. 745, 803 (30 U.S.C. 811, 957))

[40 FR 41777, Sept. 9, 1975]

§ 77.216–3 Water, sediment, or slurry impoundments and impounding structures; inspection requirements; correction of hazards; program requirements.

(a) All water, sediment, or slurry impoundments which meet the requirements of § 77.216(a) shall be examined by a qualified person designated by the person owning, operating or controlling the impounding structure at intervals not exceeding seven days for appearances of structural weakness and other hazardous conditions. All instruments shall be monitored at inter-

vals not exceeding seven days by a qualified person designated by the person owning, operating, or controlling the impounding structure.

(b) When a potentially hazardous condition develops, the person owning, operating or controlling the impounding structure shall immediately:

(1) Take action to eliminate the potentially hazardous condition;

(2) Notify the District Manager;

(3) Notify and prepare to evacuate, if necessary, all coal miners from coal mine property which may be affected by the potentially hazardous conditions; and

(4) Direct a qualified person to monitor all instruments and examine the structure at least once every eight hours, or more often as required by an authorized representative of the Secretary.

(c) After each examination and instrumentation monitoring referred to in paragraphs (a) and (b) of this section, each qualified person who conducted all or any part of the examination or instrumentation monitoring shall promptly record the results of such examination or instrumentation monitoring in a book which shall be available at the mine for inspection by an authorized representative of the Secretary, and such qualified person shall also promptly report the results of the examination or monitoring to one of the persons specified in paragraph (d) of this section.

(d) All examination and instrumentation monitoring reports recorded in accordance with paragraph (c) of this section shall include a report of the action taken to abate hazardous conditions and shall be promptly signed or countersigned by at least one of the following persons:

(1) The mine foreman;

(2) The assistant superintendent of the mine;

(3) The superintendent of the mine;

(4) The person designated by the operator as responsible for health and safety at the mine.

(e) Before May 1, 1976, the person owning, operating, or controlling a water, sediment, or slurry impoundment which meets the requirements of § 77.216(a) shall adopt a program for carrying out the requirements of paragraphs (a) and (b) of this section. The program shall be submitted for approval to the District Manager. The program shall include as a minimum:

(1) A schedule and procedures for examining the impoundment and impounding structure by a designated qualified person;

(2) A schedule and procedures for monitoring any required or approved instrumentation by a designated qualified person;

(3) Procedures for evaluating hazardous conditions;

(4) Procedures for eliminating hazardous conditions;

(5) Procedures for notifying the District Manager;

(6) Procedures for evacuating coal miners from coal mine property which may be affected by the hazardous condition.

(f) Before making any changes or modifications in the program approved in accordance with paragraph (e) of this section, the person owning, operating, or controlling the impoundment shall obtain approval of such changes or modifications from the District Manager.

(g) The qualified person or persons referred to in paragraphs (a), (b)(4), (c), (e)(1), and (e)(2) of this section shall be trained to recognize specific signs of structural instability and other hazardous conditions by visual observation and, if applicable, to monitor instrumentation.

(Secs. 101, 508, Pub. L. 91-173, 83 Stat. 745, 803 (30 U.S.C. 811, 957))

[40 FR 41777, Sept. 9, 1975]

§ 77.216–4 Water, sediment or slurry impoundments and impounding structures; reporting requirements; certification.

Every twelfth month following the submission of information specified in § 77.216-2(a) the person owning, operating, or controlling a water, sediment, or slurry impoundment and impounding structure that has not been abandoned in accordance with an approved plan, shall submit to the District Manager a report describing any changes in the geometry of the impounding structure; instrumentation; average and maximum depths and elevations

of the impounded water, sediment, or slurry; storage capacity of the impounding structure; the volume of water, sediment, or slurry impounded; and any other aspect of the impounding structure affecting its stability which has occurred during such reporting period. The report shall also contain a certification by a registered engineer that all work was performed in accordance with the approved plan.

(Secs. 101, 508, Pub. L. 91-173, 83 Stat. 745, 803 (30 U.S.C. 811, 957))

[40 FR 41778, Sept. 9, 1975]

§ 77.216-5 Water, sediment or slurry impoundments and impounding structures; abandonment.

Prior to abandonment of any water, sediment, or slurry impoundment and impounding structure which meets the requirements of § 77.216(a), the person owning, operating, or controlling such an impoundment and impounding structure shall submit to and obtain approval of the District Manager a plan for abandonment based on current, prudent engineering practices which shall contain provisions to preclude the probability of future impoundment of water, sediment, or slurry, provide for major slope stability, and include a schedule for the plan's implementation.

(Secs. 101, 508, Pub. L. 91-173, 83 Stat. 745, 803 (30 U.S.C. 811, 957))

[40 FR 41778, Sept. 9, 1975]

§ 77.217 Definitions.

For the purpose of §§ 77.214 through 77.216-5, the term:

(a) "Abandoned" as applied to any refuse pile or impoundment and impounding structure means that work on such pile or structure has been completed in accordance with a plan for abandonment approved by the District Manager.

(b) "Area-capacity curves" means graphic curves which readily show the reservoir water surface area, in acres, at different elevations from the bottom of the reservoir to the maximum water surface, and the capacity or volume, in acre-feet, of the water contained in the reservoir at various elevations.

(c) "Impounding structure" means a structure which is used to impound water, sediment, or slurry, or any combination of such materials.

(d) "Probable maximum precipitation" means the value for a particular area which represents an envelopment of depth-duration-area rainfall relations for all storm types affecting that area adjusted meteorologically to maximum conditions.

(e) "Refuse pile" means a deposit of coal mine waste which may contain a mixture of coal, shale, claystone, siltstone, sandstone, limestone, and related materials that are excavated during mining operations or separated from mined coal and disposed of on the surface as waste byproducts of either coal mining or preparation operations. "Refuse pile" does not mean temporary spoil piles of removed overburden material associated with surface mining operations.

(f) "Safety factor" means the ratio of the forces tending to resist the failure of a structure to the forces tending to cause such failure as determined by accepted engineering practice.

(Secs. 101, 508, Pub. L. 91-173, 83 Stat. 745, 803 (30 U.S.C. 811, 957))

[40 FR 41778, Sept. 9, 1975]

Subpart D—Thermal Dryers

§ 77.300 Thermal dryers; general.

On and after July 1, 1971 dryer systems used for drying coal at high temperatures, hereinafter referred to as thermal dryers, including rotary dryers, continuous carrier dyes, vertical tray, and cascade dryers, multilouver dryers, suspension or flash dryers, and fluidized bed dryers, shall be maintained and operated in accordance with the provision of § 77.301 to § 77.306.

[36 FR 9364, May 22, 1971, as amended at 36 FR 13143, July 15, 1971]

§ 77.301 Dryer heating units; operation.

(a) Dryer heating units shall be operated to provide reasonably complete combustion before heated gases are allowed to enter hot gas inlets.

STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

March 4, 1986

Mr. Allen Klein, Administrator
Office of Surface Mining
Brooks Towers
1020 15th Street
Denver, Colorado 80202

Dear Mr. Klein:

Re: Draft Decision Document, Genwal Coal Company, Crandall Canyon Mine, Lease Tract 2, ACT/015/032, Folder No. 2 and 4, Emery County, Utah

Enclosed is Utah's Draft Decision Document for the above-referenced mine. The Division of Oil, Gas and Mining has found that, with the addition of one stipulation, the applicant's proposal is adequatae to comply with the requirements of SMCRA and the Utah Program.

To date, DOGM has not received letters of concurrence from the U. S. Fish and Wildlife Service or the U. S. Forest Service. Please contact Lowell Braxton or Susan Linner as soon as questions or concerns are identified.

Best regards,

Dianne

Dianne R. Nielson
Director

SCL:jvb
cc: R. Holbrook
A. King
L. Braxton
D. Cline
D. Darby
L. Kunzler
S. Linner
0028R-75

CONTENTS

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FINDINGS

Genwal Coal Company
Crandall Canyon Mine
Lease Tract 2
ACT/015/032
Emery County, Utah

February 21, 1986

1. The application for the Tract 2 permit, updated through January 7, 1986 is accurate and complete and all requirements of the Surface Mining Control and Reclamation Act, and the Utah State program have been complied with (as required by UMC 786.19(a)). However, the Tract 2 application relies upon information present in the Mining and Reclamation Plan (MRP) for Tract 1. Tract 1 is currently undergoing a mid-term review. A new updated MRP has been submitted, but has not yet been approved.

2. The DOGM has performed a Technical Analysis (TA) and concluded that:

   A. No additional surface reclamation is required since the new lease will be mined as an underground extension of the existing mine. There will be no new surface facilities (UMC 786.19[b]).

   B. A cumulative hydrologic impacts assessment by DOGM for the Tract 2 Lease reveals that the operations have been designed to prevent damage to the hydrologic balance outside the permit area (see Cumulative Hydrologic Impact Assessment [CHIA] attached). The details of the type and extent of impacts are included in the CHIA (UMC 786.19[c]).

3. After reviewing the description of the proposed permit area and the application (Sections 1.2 and 2.5), the DOGM has determined that the area is:

   A. Not included within an area designated unsuitable for coal mining operations.

   B. Not within an area under study for designating lands unsuitable for coal mining operations.

   C. Not on any land subject to the prohibitions or limitations of 30 CFR 761.11(a) (national parks, etc.), 761.11(f) (public buildings, etc.) and 761.11(g) (cemetery).

   D. Not within 100 feet of the outside right-of-way of public roads.

E. Not within 300 feet of an occupied building (UMC 786.19[d]).

4. The issuance of a permit and the Secretarial decision on the Mineral Leasing Act plan are in compliance with the National Historic Preservation Act and implementing regulations (October 2, 1984 letter from SHPO, and personal communication, Jim Dykman, Divsion of State History, February 14, 1986) (UMC 786.19[e]).

5. The applicant has the legal right to enter and begin underground mining activities in the permit area. The applicant has provided information required by UMC 782.15(b) (MRP Section 2.4) (UMC 786.19[f]).

6. The applicant has submitted proof and the DOGM records indicate that prior violations of applicable laws and regulations have been corrected (DOGM NOV/CO Status Report, personal communication, Dave Lof, February 21, 1986) (UMC 786.19[g]).

7. The OSM records confirm that all fees for the Abandoned Mine Reclamation Fund have been paid (personal communication, John Sender, OSM Fee Compliance Officer) (UMC 786.19[h]).

8. The DOGM records show that the applicant does not control and has not controlled mining operations with a demonstrated pattern of willful violations of the Act of such nature, duration and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the provisions of the Act (UMC 786.19 [i]).

9. Coal mining and reclamation operations to be performed under the permit will not be inconsistent with other underground mines in the general vicinity. The only adjacent mine is the Huntington #4 Mine which has been closed and reclaimed (UMC 786.19 [j]).

10. The applicant has posted a surety bond for the Crandall Canyon Mine in the amount of $136,729.00. No additional Surety will be required for this modification since there is no additional surface disturbance proposed (UMC 786.19[k]).

11. The applicant has provided evidence and the DOGM has found that there are no prime farmlands in the permit area (MRP Section 2.5) (UMC 786.19[l]).

12. The DOGM has determined that there are no Alluvial Valley Floors (AVF) existing within the proposed permit area. There are no AVF's which may be negatively impacted by mining of Tract 2 (UMC 786.19[l]).

13. The proposed postmining land-use for the permit area has been approved by the DOGM and is the same as the premining land use (UMC 786.19[m]).

14. All specific approvals required by the Act, the Utah State Program and the Federal Lands Program have been made (UMC 786.19[n]).

15. The proposed operation will not affect the continued existence of threatened or endangered species or result in the destruction or adverse modification of their critical habitats. No surface disturbance will occur (UMC 786.19[o]).

16. All procedures for public participation required by the Act, and the approved Utah State Program have been complied with (UMC 786.23[a][2]).

Prior to the permit taking effect, the applicant must forward a letter stating its acceptance of the special stipulations in the permit.

Susan C. Linner
Permit Supervisor

Lowell P Braxton
Administrator, Mineral Resource
Development and Reclamation Program

Leonard E. Mey
Associate Director
Division of Oil, Gas and Mining

Barbara W. Roberts
Approved as to Form
Assistant Attorney General

Dianne R. Nielson
Director
Division of Oil, Gas and Mining

0688R

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT
Genwal Coal Company
Crandall Canyon Mine
ACT/015/032
Emery County, Utah

February 25, 1986

I. Introduction

The purpose of this report is to provide a Cumulative Hydrologic Impact Assessment (CHIA) for Genwal Coal Company's Crandall Canyon Mine located in Emery County, Utah. The assessment encompasses the probable cumulative impacts of all anticipated coal mining in the general area on the hydrologic balance and a determination of whether the operations proposed under the application have been designed to prevent damage to the hydrologic balance outside the proposed mine plan area. This report complies with federal legislation passed under the Surface Mining Control and Reclamation Act (SMCRA) and subsequent Utah and federal regulatory programs under UMC 786.19(c) and 30 CFR 784.14(f), respectively.

Genwal Coal Company's Crandall Canyon Mine is located along the eastern margin of the Wasatch Plateau Coal Field approximately 15 miles west of Huntington, Utah (Figure 1). The eastern margin of the Wasatch Plateau forms a rugged escarpment that overlooks Castle Valley and the San Rafael Swell to the east. Elevations along the eastern escarpment of the Wasatch Plateau range from approximately 6,500 to over 9,000 feet.

Outcropping rocks of the Wasatch Plateau Coal Field range from Upper Cretaceous to Quaternary in age. The rock record reflects an overall regressive sequence from marine (Mancos Shale) through littoral and lagoonal (Blackhawk Formation) to fluvial (Castlegate Sandstone, Price River Formation and North Horn Formation) and lacustrine (Flagstaff Formation) depositional environments. Oscillating depositional environments within the overall regressive trend are represented by lithologies within the Blackhawk Formation. The major coal-bearing unit within the Wasatch Plateau Coal Field is the Blackhawk Formation.

Precipitation varies from 40 inches at higher elevations to less than 10 inches at lower elevations. The Wasatch Plateau may be classified as semiarid to subhumid.

Vegetation varies from the Sagebrush/Grass community type at lower elevations to the Douglas Fir/Aspen community at higher elevations. Other vegetative communities include Mountain Brush, Pinyon-Juniper, Pinyon-Juniper/Sagebrush and Riparian. These communities are primarily used for wildlife habitat and livestock grazing.

Crandall Creek which flows past the Crandall Canyon Mine is a perennial tributary to Huntington Creek which is a tributary to the San Rafael River. The upper drainage of Huntington Creek encompasses about 200 square miles of mountainous country in the Wasatch Plateau. About 90 percent of the area is higher than 8,000 feet. The average channel gradient along Huntington Creek is about 100 feet per mile. The lower reaches of the tributaries to Huntington Creek typically have surface relief between the stream channels and tops of adjacent canyon walls of 2,000 feet or more.

II. Cumulative Impact Area (CIA)

Figure 2 delineates the current Crandall Canyon Mine operations and CIA. The CIA includes the Crandall Canyon drainage and a portion of Huntington Creek. The CIA boundary is defined on the north, south and west by the Crandall Canyon drainage divide and on the east by Huntington Creek. A first level analysis was conducted using these boundaries to determine hydrologic impacts. Completion of the review at this level indicated that cumulative hydrologic impacts did not exist within these limits. Therefore, further analysis was not conducted beyond these limits and the CIA was determined to be complete. The CIA encompasses approximately 4,565 acres.

III. Scope of Mining

Genwal Coal Company controls approximately 162 acres in Emery County, Utah, 77.53 acres of which is a new lease and will be referred to as Tract 2. Mining was conducted historically near this site from November, 1939 to September 1955. Mining in Tract 1 began in 1983. Approximately 811,000 tons of coal in place are estimated to exist in the Hiawatha Seam within the Tract 2 area. Production during the first year will be approximately 327,000 tons, with an average yearly production of 360,000 tons per year.

Access to the Tract 2 area will be by extending the existing Tract 1 North Main entries into the new permit area. All existing surface facilities on Tract 1 will be utilized to mine the Tract 2 lease and no new surface facilities will be constructed. Existing surface breakouts from the seam in Tract 1 for ventilation and haulage are made in Crandall Canyon and will be utilized for Tract 2 as well.

The current method of room and pillar mining in use on Tract 1 will be continued into Tract 2. Pillars will be removed upon abandonment of sections. Overall, an advance-retreat mining system is projected for Tract 2 with retreat mining employed prior to abandonment of each section.

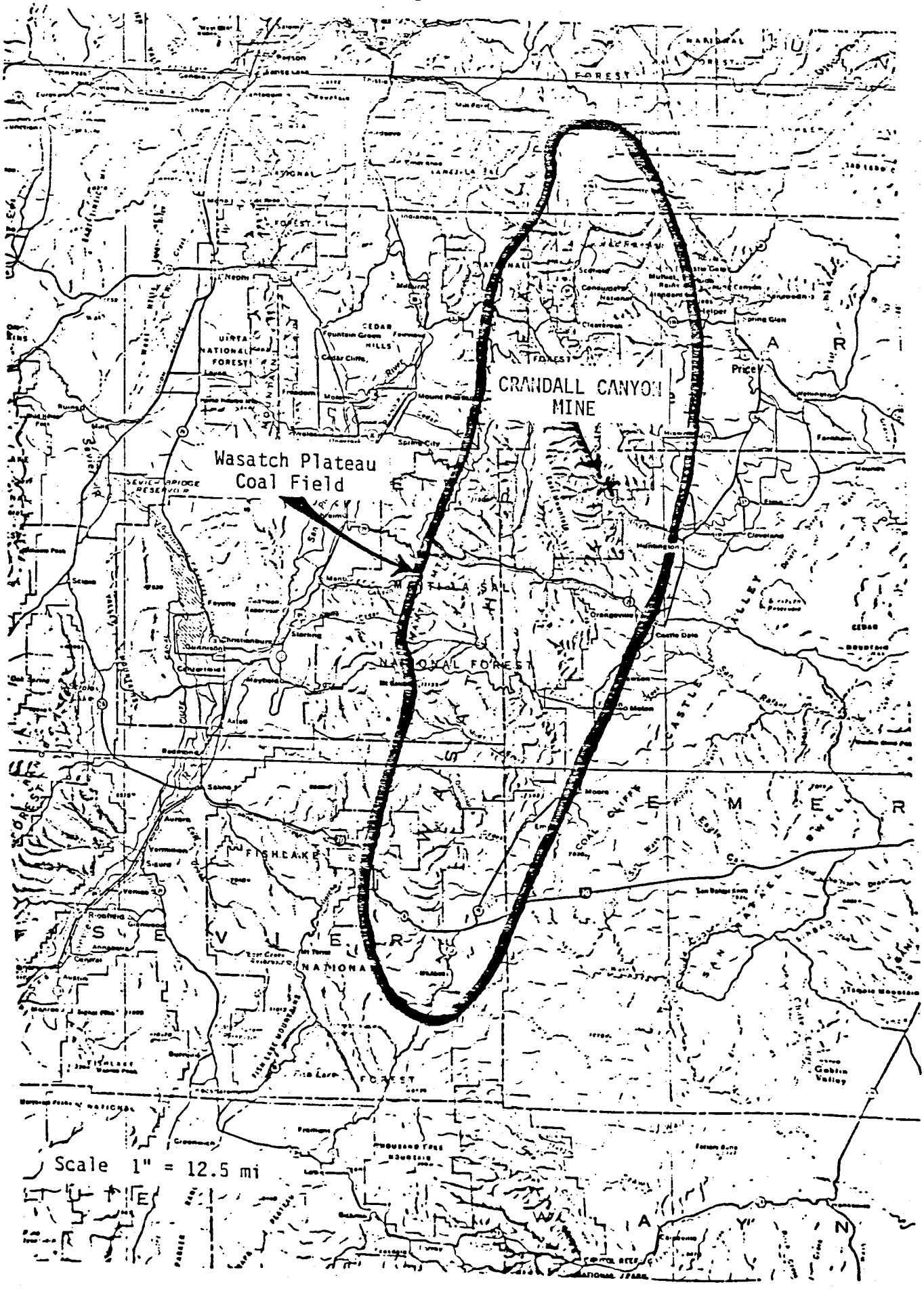

Figure 1. Wasatch Plateau Coal Field

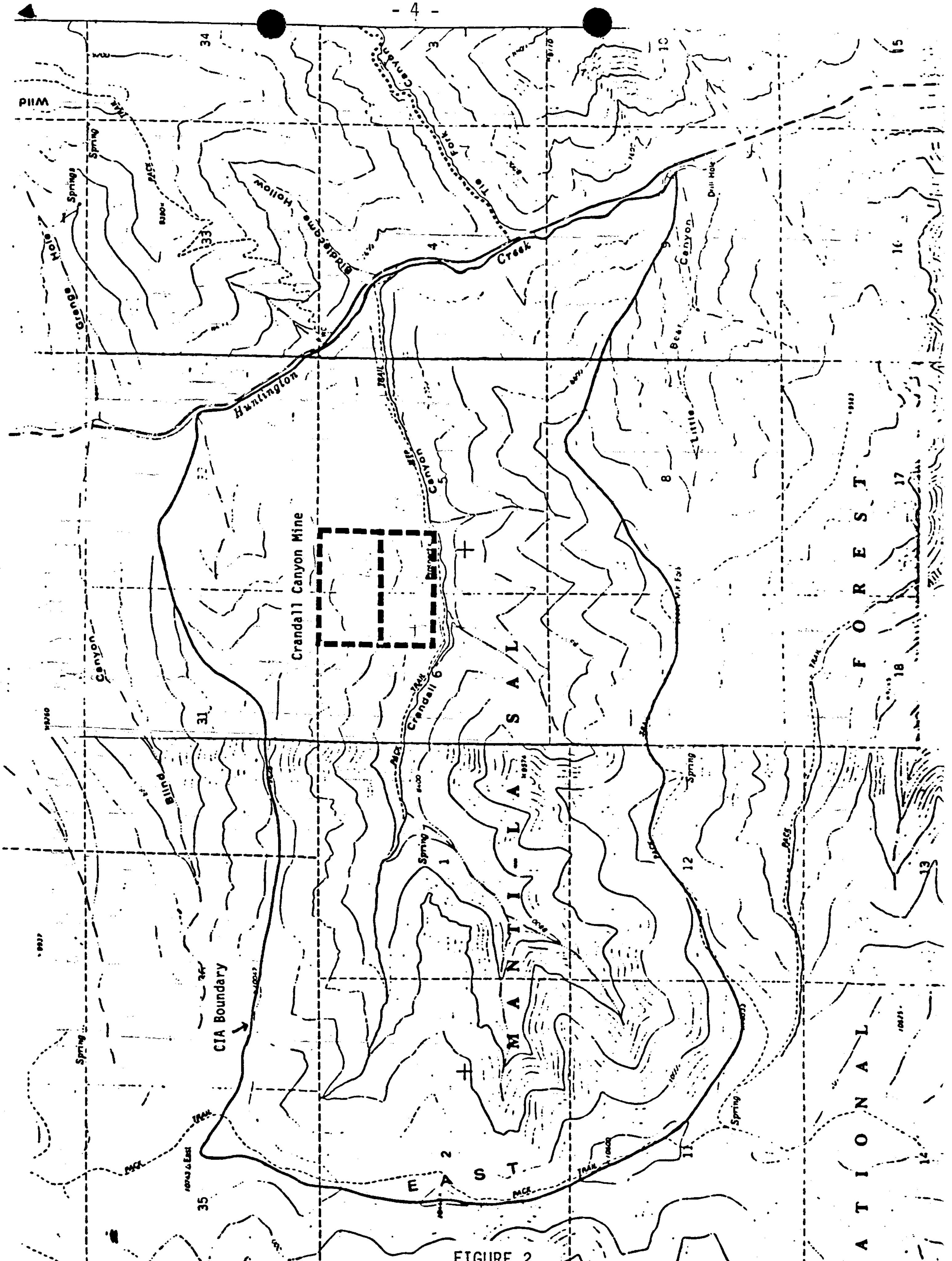
Crandall Canyon Mine
CIA Boundary
Huntington
Creek
Crandall
Canyon
Blind
Canyon
Bear
Canyon
Little
Grange
Hole
Springs
Spring
Hollow
Wild
EAST
MANTI-LA SAL
NATIONAL FOREST

FIGURE 2

The permit area is comprised of coal lands leased by Genwal Coal Company from the United States Bureau of Land Management, under lease SL-062648. The surface lands are controlled by the United States Forest Service, Manti-LaSal National Forest.

The amount of reserves within the permit area is mineable within two years, however, access will be maintained through this permit area until all future reserves to the northwest and west are mined. At the present time Genwal Coal Company holds no further leases, however, an emergency lease application has been submitted for an additional 256 acres.

IV. Study Area

A. Geology

The formations exposed in the Wasatch Plateau are Tertiary and Cretaceous-aged sedimentary units. These formations are of both continental and marine origin and are comprised principally of shale and sandstone. Siltstone, mudstone and limestone occur in lesser amounts. The formations in the Wasatch Plateau area generally dip one to three degrees westward off the west flank of the San Rafael Swell. Superimposed over the region are numerous synclines, anticlines and fault zones. The syncline and anticline areas have predominant east-west orientation, while the fault zones are generally oriented north-south.

Stratigraphic units outcropping within the study area include, from oldest to youngest, the Masuk Shale Member of the Mancos Shale, Starpoint Sandstone, Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation and Quaternary deposits. Lithologic descriptions and unit thicknesses are shown in Figure 3.

The Hiawatha Coal Seam, which is the coal seam to be mined in the Tract 2 area, occurs at the base of the Blackhawk Formation. The Hiawatha Coal Seam has been mined in the Tract 1 Lease and is exposed at an approximate elevation of 7900 feet. Maximum overburden is approximately 1500 feet in the northwest corner of the Tract 2 Lease with an average overburden of approximately 800-900 feet. The entire permit area is underlain by the Starpoint Sandstone.

B. Topography and Precipitation

Topography in the area is generally very steep and rugged with elevations ranging from approximately 7,200 feet to over 10,000 feet above sea level. Slopes vary from vertical cliffs to less than 2 percent. The CIA is characterized by Crandall Canyon Creek, which originates above 10,000 feet and drains east into Huntington Creek. The CIA also includes an unnamed ephemeral drainage to the west of the permit area that also drains to the east into Huntington Creek.

System	Series	Stratigraphic Unit	Thickness (feet)	Lithology and water-bearing characteristics
Quaternary	Holocene and Pleistocene	Quaternary deposits	0-100	Alluvium and colluvium; clay, silt, sand, gravel, and boulders; yields water to springs that may cease to flow in late summer.
Tertiary	Paleocene	North Horn Formation	800±	Variegated shale and mudstone with interbeds of tan-to-gray sandstone; all of fluvial and lacustrine origin; yields water to springs.
Cretaceous	Upper Cretaceous	Price River Formation	600-700	Gray-to-brown, fine-to-coarse, and conglomeratic fluvial sandstone with thin beds of gray shale; yields water to springs locally.
		Castlegate Sandstone	150-250	Tan-to-brown fluvial sandstone and conglomerate; forms cliffs in most exposures; yields water to springs locally.
		Blackhawk Formation	600-700	Tan-to-gray discontinuous sandstone and gray carbonaceous shales with coal beds; all of marginal marine and paludal origin; locally scour-and-fill deposits of fluvial sandstone within less permeable sediments; yields water to springs and coal mines, mainly where fractured or jointed.
		Star Point Sandstone	350-450	Light-gray, white, massive, and thin-bedded sandstone, grading downward from a massive cliff-forming unit at the top to thin interbedded sandstone and shale at the base; all of marginal marine and marine origin; yields water to springs and mines where fractured and jointed.
		Mancos Shale	600-800	Dark-gray marine shale with thin, discontinuous layers of gray limestone and sandstone; yields water to springs locally.

Figure 3. Stratigraphy of the Crandall Canyon Mine Area (modified from Danielson, et al 1981).

Precipitation in the Wasatch Plateau ranges from 10 inches to 40 inches annually. Average annual precipitation in the CIA is approximately 20 inches (Simons 1984).

C. Vegetation

There are five vegetative communities in the CIA including Sagebrush, Mountain Shrub/Grassland, Mixed Mountain Shrub, Conifer/Aspen and Spruce/Fir. Aspen are found on the north facing south slopes and higher up on the north slopes, on ridge tops. Spruce/Fir is also found on the north slopes and appears to be tied to both a moister site as well as areas with less sunlight. Mixed Mountain Shrub and Mountain Shrub/Grassland appear to be transitional and are predominant on the open exposed ridges at approximately mid-slope. The Sagebrush community follows primarily along the ridges and is more than likely climax in nature to the shrub grass associations.

V. Hydrologic Resources

A. Ground Water

The principle factor controlling the occurences and availability of ground water in any area is geology. The ground water regime within the CIA is dependent upon geologic and climatic parameters that establish systems of recharge, movement and discharge.

Snowmelt at higher elevations provides most of the groundwater recharge, particularly where permeable lithologies or faults/ fractures are exposed at the surface. Vertical migration of ground water occurs through permeable rock units and/or along zones of faulting and fracturing. Lateral migration initiates when ground water encounters impermeable rocks and continues until either the land surface is intersected (and spring discharge occurs) or other permeable lithologies or zones are encountered that allow further vertical flow.

A seep and spring survey conducted by Earthfax Engineering in June and October of 1985 revealed the following information concerning the geology and aquifer characteristics in the vicinity of the mine.

Six formations outcrop in and adjacent to the Tract 2 area. According to Doelling (1972), the Masuk Shale Member of the Mancos Shale is a light gray to blue-gray marine sandy shale in the mine vicinity. This unit is exposed at the mouth of Crandall Canyon and in adjacent areas along Huntington Creek. The Masuk Shale Member yields water locally to seeps and springs but does not serve as a regionally important aquifer (Danielson et al., 1981).

The Star Point Sandstone is predominantly a light gray massive sandstone with minor interbedded layers of shale and siltstone near its base (Doelling, 1972). In the vicinity of the mine, the Star Point Sandstone is approximately 300 feet thick. The Star Point serves as an important regional aquifer (Danielson et al., 1981), yielding water to several minor and some major springs where fractured and jointed.

The Blackhawk Formation is the principal coal-bearing unit in the region (Doelling, 1972). This formation consists of interbedded layers of sandstone, siltstone, shale, and coal, all of marine origin. The Blackhawk is approximately 700 feet thick in the mine area, with the principal coal seam (the Hiawatha seam) occurring near the bottom of the formation. The formation yields water to springs and coal mines when fractured. Where it is locally interbedded with the Star Point Sandstone, the lower portion of the Blackhawk Formation is considered an aquifer (Danielson et al., 1981).

The Castlegate Sandstone overlies the Blackhawk Formation and consists of tan to brown cliff-forming sandstones of fluvial origin. The sandstones are massive and medium- to coarse-grained. In the area of the mine, the Castlegate yields water locally to seeps and springs but does not serve as an important regional aquifer because it is commonly drained within short distances from its recharge area due to deeply incised canyons (Danielson et al., 1981).

The Price River Formation consists predominantly of friable limey sandstone interbedded with pebbly conglomerates and shales. It forms steep receding slopes and reaches a maximum thickness of about 500 feet in the mine area (Doelling, 1972). This formation yields water locally to seeps and springs (Danielson et al., 1981). However, like the Castlegate Sandstone, deeply incised canyons in the area prevent the Price River Formation from being an important regional aquifer.

The uppermost formation that outcrops within the area adjacent to the mine plan area is the North Horn Formation. This formation consists of interbedded limestones, sandstones, and shales (Doelling, 1972). Due to high topographic presence, the North Horn Formation in the CIA serves primarily as a recharge unit to underlying formations rather than as an important source of water itself.

Investigations by Danielson et al. (1981) indicated that most, if not all, ground water in the region is derived from snowmelt. Recharge tends to be limited in areas underlain by the Price River Formation and older rocks (relative to recharge in areas underlain by younger rocks) due to slope steepness and relative imperviousness (both of which promote runoff rather than infiltration of snowmelt).

Detailed potentiometric surface data are not available for the CIA, however, the deeply incised canyons interrupt the flow of ground water in much of the area. Danielson et al. (1981) suggest that goundwater generally moves from high areas of recharge to low areas of drainage, principally along stream channels. This flow pattern is altered locally where geologic structure plays a dominant role.

The predominant chemical constituents in most springs in the region are calcium and bicarbonate (Danielson et al., 1981). Dissolved solids concentrations generally range from about 50 to 750 milligrams per liter. Regionally, the concentrations of major dissolved constituents in water from individual geologic units is highly variable, due to the complex lithologic nature of the area (Danielson et al., 1981).

Over 50 percent of the seeps and spring discovered during the June inventory issued from the Blackhawk Formation. However, flow rates at these points were normally minimal (less than one gallon per minute), with seepage issuing predominantly at the interface between sandstone lenses above and less permeable shale layers below. Most of these seeps and springs had dried up prior to the October survey. Useage at these points of seepage is minimal, due to the low flow rate and inaccessibility of the seeps.

The low seepage rates measured in most of the seeps and springs issuing from Blackhawk Formation are due to the low hydraulic conductivity of the formation in its unfractured state. Laboratory permeability data provided by Lines (1985) from a core sample collected in Section 27, T. 17 S., R. 6 E. (approximately 10 miles south of the mine permit area) indicate that sandstone units within the Blackhawk Formation have an average horizontal hydraulic conductivity of 1.3×10^{-2} feet per day and an average vertical hydraulic conductivity of 3.8×10^{-3} feet per day. Shales and siltstones within the Blackhawk Formation were found to have maximum horizontal and vertical hydraulic conductivities of 1.0×10^{-7} and 1.2×10^{-6} feet per day, respectively.

The relatively large hydraulic conductivity of the sandstones of the Blackhawk Formation compared with the siltstone and shales indicates that the fine grained sediments of the formation serve as barriers to the downward movement of water. In simple terms, as water recharges the Blackhawk Formation (either through snowmelt, rainfall, or subsurface seepage from an adjacent formation), it is permitted to percolate downward within the sandstone beds. However, upon reaching a less permeable siltstone or shale layer, the water is forced to flow horizontally to the surface, issuing at the interface between the two units.

Notable exceptions to the above generality concerning the Blackhawk Formation occur at a few springs that issue from fractured sandstone within the formation. Examples of this phenomenon were found in the western portion of the survey area, where flow rates of up to 15 gallons per minute were encountered during both the June and October inventories. Travertine deposits are common at these springs, suggesting that the recharge area for these springs is dominated by limestone (probably the North Horn Formation on the ridges to the north and west). The Blackhawk Formation apparently serves more as a conveyance body rather than a significant source of water to these springs.

Several seeps and springs issue at the site from colluvium overlying sandstone of the Blackhawk Formation and the Castlegate Sandstone. These seeps normally occur in drainage bottoms where shallow subsurface water collects at topographic lows. Nearly all flows from seeps of this type were insignificant in both June and October, suggesting (together with the topographic position) that these seeps are intermittent in nature.

Most seeps and springs issuing within the survey area from the Castlegate and Star Point Sandstones flow from bedding planes within these formations. Flows issuing in this manner were generally low during the June inventory (less than one gallon per minute) and nonexistent during the October inventory.

As noted, flow rates measured during the October survey were generally significantly less than those found during the June survey. In June, a total of 80 seeps or springs were found, 34 of which had sufficient flow to sample (the remaining 46 were seeps that could not be sampled). In October, 55 of the sources originally discovered were dry. An additional 7 sources existed only as seeps, with only 18 of the original sources containing sufficient flow to sample.

The results of the seep and spring inventory tend to support the conclusion of Danielson et al. (1981) that groundwater occurs in most geologic formations at the site (all but the Masuk Shale Member of the Mancos Shale), but none of the units are saturated everywhere. No continuous zones of saturation appear to be present at the site, indicating that potentiometric surface maps would be difficult to prepare. Based on the conclusions of Danielson et al. (1981), it is assumed that groundwater within the permit and adjacent areas flows toward the main canyons (Crandall, Blind, and Huntington) and then along Huntington Canyon to the valley bottom.

The data indicates that the specific conductance of water issuing from springs in June generally increased with increasing stratigraphic depth. This is in agreement with findings of Danielson et al. (1981). Springs issuing from the Price River

Formation typically had a specific conductance during the June survey that varied from 150 to 450 umhos/cm at 25°C while those issuing from the Blackhawk Formation and Star Point Sandstone had a specific conductance varying from 500 to 1000 umhos/cm at 25°C. This increase in specific conductance is indicative of leaching of minerals by the groundwater as it flows through increasing distances of bedrock to the lower stratigraphic positions.

The pH of water issuing from springs in the survey area showed no trends within or between formations. Values varied from 6.80 to 8.57, averaging 7.74. Hence, spring water in the study area is slightly alkaline.

In those springs with sufficient water to sample, pH generally increased slightly between June and October. Increases normally amounted to 0.1 to 0.5 pH unit. Specific conductance showed no consistent pattern between the June and October data, with approximately as many increases as decreases between June and October.

Inflow to the existing underground workings amounts to approximately 100 gallons per minute. These inflows originate primarily in gob sections near the working face of the mine. Currently, water encountered in the mine is used underground in the mining process.

B. Surface Water

Crandall Canyon is an east-flowing tributary of Huntington Creek, one of the major tributaries of the San Rafael River. Huntington Creek had annual flows near Huntington ranging from 25,000 to 150,000 acre-feet during the period of October 1931 through September 1973, averaging 65,000 acre-feet per year (Waddell et al., 1981). Variations in the annual flow of Huntington Creek near Huntington are portrayed graphically in Figure 4.

Approximately 50 to 70 percent of streamflow in the mountain streams of the region occurs during May through July (Waddell et al., 1981). Streamflow during this late spring/early summer period is the result of snowmelt runoff. Such seasonal variations are common for streams in the area (Waddell et al., 1981).

The quality of water in Huntington Creek and other similar streams in the area varies significantly with distance downstream. Waddell et al. (1981) found that concentrations of dissolved solids varied from 125 to 375 milligrams per liter in reaches above major diversions to 1600 to 4025 milligrams per liter in reaches below major irrigation diversions and population centers. The major ions at the upper sites were found to be calcium, magnesium, and bicarbonate, whereas sodium and sulfate became more dominant at the

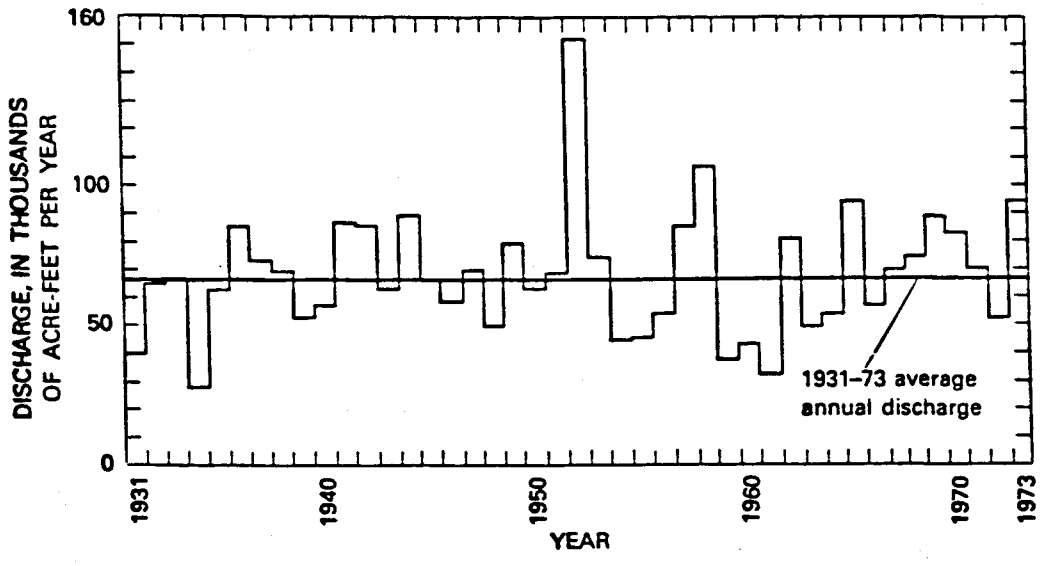

Figure 4 Annual discharge of Huntington Creek near Huntington (from Waddell et al., 1981).

lower sites. They attributed these changes to (1) diversion of water containing low dissolved solids concentrations, (2) subsequent irrigation and return drainage from moderate to highly saline soils, (3) groundwater seepage, and (4) inflow of sewage and pollutants from population centers.

Average annual sediment yields within the Huntington Creek drainage basin range from approximately 0.1 acre-feet per square mile in the headwaters area to about 3.0 acre-feet per square mile near the confluence with the San Rafael River (Waddell et al., 1981). Increases in sediment yield with increasing distance downstream is generally the result of increasing amounts of shale and sandstone in the downstream direction (Waddell et al., 1981).

The U. S. Geological Survey established a gaging station at the mouth of Crandall Creek in 1978. Flow data collected at the gaging station are not complete for the winter in most years, due presumably to data acquisition problems. However, the limited data indicate that most of the flow of Crandall Creek occurs in the period of May through July, in keeping with the conclusions of Waddell et al. (1981). Assuming an average of 30 acre-feet per month for the period of missing record, the average annual flow for the six year period of data was 2740 acre-feet.

Surface water quality data collected from Crandall Creek by Genwal for the Tract 1 Lease from 1985 indicate that the dominant ions in Crandall Creek ~~are calcium and bicarbonate.~~ Total dissolved solids concentrations in the stream have varied from 180 to 286 milligrams per liter, with lower concentrations normally occuring during the high flow season. Total suspended solids concentrations in Crandall Creek have varied during the period of record from /0.5 to 208.0 milligrams per liter. As expected, the highest suspended solids concentrations generally occur during periods of highest flow.

Vi. Potential Hydrologic Impacts

A. Ground Water

Dewatering and subsidence related to mining have the greatest potential for impacting groundwater resources in the CIA.

Dewatering

Inflow into the existing underground workings amounts to approximately 100 gallon per minute. These inflows originate primarily in gob sections near the working face of the mine. Currently, water encountered in the mine is used underground in the mining process. Continued interception of mine inflow may potentially dewater certain

localized aquifers not only during the first five year permit term but also throughout the life-of-mine as the workings are further developed.

Subsidence

Subsidence impacts are largely related to extension and expansion of the existing fracture system and upward propagation of new fractures. Inasmuch as vertical and lateral migration of water appears to be largely controlled by fracture conduits, readjustment or realignment in the conduit system may potentially produce changes in the configuration of ground-water flow. Potential changes include increased flow rates along fractures that have "opened" and diverting flow along new fractures or permeable lithologies. Subsurface flow diversions may cause the depletion of water in certain localized aquifers, whereas increased flow rates along fractures would reduce ground-water residence time and potentially improve water quality.

Therefore, mining in the Tract 2 Lease may dewater certain localized aquifers and affect flow rates along existing or new subsidence related fractures. However, these impacts will be localized near the mine permit area. No other ground water disturbances exist within the CIA and cumulative hydrologic impacts are not expected.

B. Surface Water

The main concern in terms of impact to surface water is water quality deterioration downstream from the minesite, primarily in the form of suspended sediments. Typically the suspended sediment concentration in Crandall Canyon Creek since 1983 varied from approximately 205 mg/l to 0.5 mg/l. The low suspended sediment values are associated with natural climatic and geologic process although a proportion may be attributed to surface disturbances from roads and the mine pad area. Sediment controls do exist for the disturbed surface areas. Therefore, the impact associated with mining in Crandall Canyon is minimized by surface controls (i.e., sediment pond, diversions, etc.). No other surface disturbances due to mining occur within the CIA and therefore cumulative hydrologic impacts are not expected.

The operational design proposed for the Crandall Canyon Mine is herein determined to be consistent with preventing damage to the hydrologic balance outside the mine plan area.

0689R

REFERENCES

Danielson, T. W., M.D. ReMillard, and R. H. Fuller. 1981 Hydrology of the Coal-Resource Areas in the Upper Drainages of Huntington and Cottonwood Creeks, Cental Utah. U. S. Geological Survey Water-Resources Investigations Open-File Report 81-539. Salt Lake City, Utah

Doelling, H. H. 1972. Central Utah Coal Fields: Sevier-Sanpete, Wasatch Plateau, Book Cliffs, and Emery. Utah Geological and Mineral Survey Monograph Series No. 3. Salt Lake City, Utah.

Lines, G. C. 1983. Water Resources Division, U. S. Geological Survey, Salt Lake City, Utah. Personal communication.

Simons, Li and Associates. 1984. Cumulative Hydrologic Impact Assessment Huntington Creek Basin, Emery County, Utah. Fort Colline, Colorado

Waddell, K. M., P. K. Contrato, C. T. Sumsion, and J. R. Butler. 1981. Hydrologic Reconnaissance of the Wasatch Plateau-Book Cliffs Coal-Fields Area, Utah. U. S. Geological Survey Water Supply Paper 2068. Washington, D. C.

STIPULATIONS

Genwal Coal Company
Crandall Canyon Mine
Lease Tract 2
ACT/015/032
Emery County, Utah

February 24, 1986

Stipulation 817.97-(1)-LK

1. Within 60 days of final approval, the applicant must finalize a mitigation plan for impacted seeps and springs that is acceptable to the DWR and submit this plan to DOGM for review and approval.

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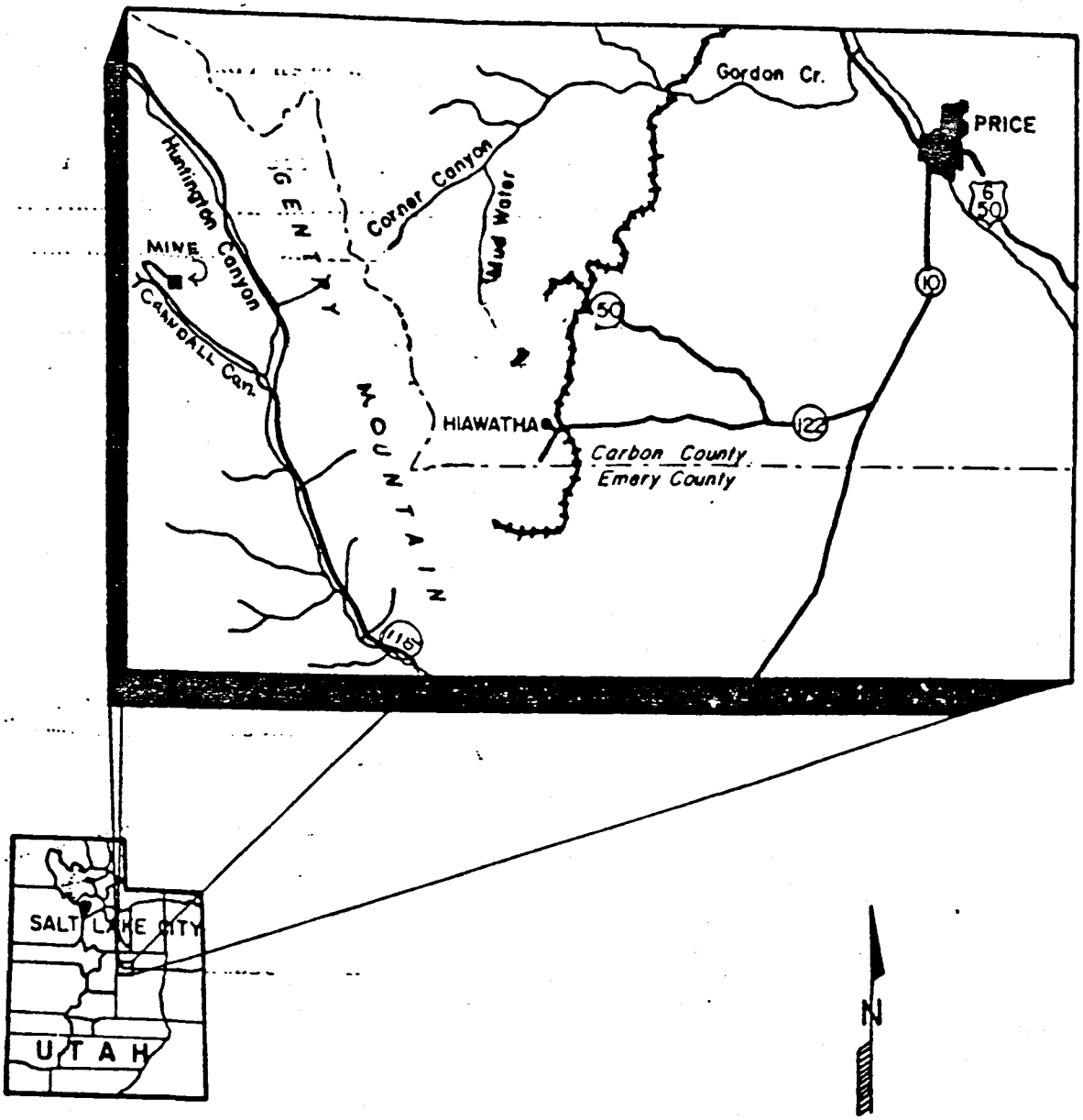

FIGURE 1-1

LOCATION MAP

Genwal Coal Company
Crandall Canyon Mine
Emery County, Utah

TECHNICAL ANALYSIS

Genwal Coal Company
Crandall Canyon Mine, Lease Tract 2
ACT/015/032, Emery County, Utah

February 24, 1986

Introduction

Genwal Coal Company proposes to add 77.53 acres to its currently approved permit area for the Crandall Canyon Mine. The additional acreage comprises a portion of Federal Lease SL-062648. The surface lands are controlled by the U. S. Forest Service (USFS), Manti-LaSal National Forest.

The Mining and Reclamation Plan (MRP) for the Crandall Canyon Tract 1 permit, which comprises the remainder of Federal Lease SL-062648, a small fee lease and a USFS Special Use Area for a total of 86.84 acres, was approved by the Office of Surface Mining (OSM) November 24, 1984 and by the Division of Oil, Gas and Mining (DOGM) May 13, 1983.

The new permit application area is estimated to contain 811,000 tons of coal in place in the Hiawatha seam. Access to this permit area will be gained by extending the North Main entries underground from the Tract 1 permit area. The current method of room-and-pillar mining will continue to be used. Mining of the new tract will be accomplished through use of the surface facilities built or approved to be built for the Tract 1 permit area. No additional surface disturbance will be required to mine Tract 2.

Genwal Coal Company (Genwal) submitted a permit application for Lease Tract 2 on July 18, 1984. Due to repermitting efforts, DOGM did not complete its Initial Completeness Review (ICR) until July 10, 1985. Genwal submitted a revised Lease Tract 2 application on August 16, 1985. DOGM responded with a Determination of Completeness (DOC) review on September 27, 1985. Genwal submitted additional information on November 6, 1985 which DOGM responded to with another DOC review letter on November 25, 1985. Genwal submitted additional information on December 26, 1985 and January 7, 1986. The plan was determined complete on January 10, 1986.

The following technical sections include an analysis of how Genwal Coal Company will comply with specific performance standards applicable to the MRP proposed for the Tract 2 permit area. Compliance with all other performance standards was determined to be the same as in the previously approved MRP and associated Technical Analysis (TA).

UMC 817.48 Hydrologic Balance: Acid-forming and Toxic-forming Materials - PGL

Existing Environment and Applicant's Proposal

The applicant stated on page 1-5 that development waste will not be brought to the surface. Therefore, no drainage from acid-forming and toxic-forming underground development waste will be exposed at the surface.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.50 Underground Mine Entry and Access Discharges - DC

Existing Environment and Applicant's Proposal

The applicant has stated that inflow to the existing underground workings in the Tract 1 Lease amounts to approximately 100 gallons per minute. The mine water inflow originates primarily in gob sections near the working face of the mine. Currently, water encountered in the mine is used underground in the mining process. The applicant is currently in the process of obtaining a NPDES permit to cover discharge from the mine in the event that larger quantities of ground water are encountered than can be utilized underground.

Compliance

The applicant's proposal meets the general requirements of this section.

Stipulations

None.

UMC 817.52 Surface and Ground Water Monitoring - DC

Existing Environment and Applicant's Proposal

Surface Water

The applicant has provided U. S. Geological Survey (USGS) surface water flow and quality data for Crandall Canyon Creek to establish baseline conditions for this area (Section UMC 783.16, items M and N, "Response to Apparent Completeness Review," September 1981).

Two 36-inch Parshall flumes were installed in July 1985 on Crandall Creek as indicated on Figure 7-7, Tract 2 MRP, August 16, 1985 (one upstream from the surface facilities and one downstream). These flumes have been equipped with Stevens Type-F water level recorders to allow the collection of continuous flow data.

Water quality samples will be collected from the flume locations quarterly (normally in January, April, July and October) and analyzed according to the list contained in Table 7-6, Tract 2 MRP, August 16, 1985. Every fifth year (1985, 1990, etc.), the samples collected during the low flow period will be analyzed according to Table 7-7 (Tract 2 MRP, August 16, 1985). Surface water monitoring data will be submitted to DOGM on a quarterly basis. At the end of each calendar year, an annual summary describing variations in flows and quality will be submitted.

Discharges from the sedimentation pond will be analyzed in accordance with the NPDES permit for the facility.

Compliance

The applicant's plan to monitor surface water in Crandall Creek will be adequate to identify significant changes and impacts to the existing surface water regime due to mining in the Tract 2 Lease. The surface facility configuration will not change due to the mining in the Tract 2 Lease. Additionally, the surface water monitoring program proposed by the applicant adheres to the Guidelines for Establishment of Surface and Ground Water Monitoring Programs as prepared by DOGM. Therefore, the applicant is in compliance with this section.

Stipulations

None.

Existing Environment and Applicant's Proposal

Ground Water

The applicant has proposed a ground water monitoring program based on the results of a seep and spring survey conducted in June and October of 1985, Tract 2 MRP, August 16, 1985. Only one spring was found during the June 1985 survey within the area of potential subsidence with a flow rate of at least one gallon per minute. This spring is located above the Tract 1 Lease and should not be affected by mining in the Tract 2 Lease. All major springs (flows of at least five gallons per minute) found during the June 1985 survey were located outside the area of potential subsidence.

Ground water monitoring for the Crandall Canyon Mine area will consist of collecting water quality and quantity data from six springs located within and adjacent to the mine permit area as well as points of significant inflow to the underground workings. The proposed locations of the springs are shown on Figure 7-2, Tract 2 MRP, August 16, 1985.

The monitoring points are located both within the area of potential subsidence and at a distance from the mine to serve as indicators of long-term changes in ground water issuing from the Blackhawk Formation. In addition, one spring issuing from the overlying Castlegate Sandstone will be monitored because of its close proximity to the mine workings and because a water right has been filed on this spring by the U. S. Forest Service (USFS).

Four samples will be collected from the monitored springs annually. With the exception of the spring located within the area of potential subsidence, each spring will be monitored at monthly increments during the accessible portion of the year (generally June through September). Samples will be analyzed according to the list of parameters on Table 7-3, Tract 2 Lease MRP, August 16, 1985. The spring located within the area of potential subsidence is accessible year-round and will, therefore, be monitored quarterly (January, April, July and October) according to Table 7-3, Tract 2 Lease MRP, August 16, 1985. Every fifth year (1985, 1990, etc.), samples collected during the low flow period will be analyzed according to the list of parameters contained in Table 7-4, Tract 2 Lease MRP, August 16, 1985.

On a quarterly basis (normally January, April, July and October) an inventory will be conducted of the active portion of the mine to identify the location and geologic occurrence of mine inflows that exceed three gallons per minute. In consultation with DOGM, certain of these inflows will be selected for continued monitoring. After selection of the inflow points to be monitored, data will be collected on a quarterly basis and analyzed according to Table 7-3, Tract 2 Lease MRP, August 16, 1985.

At the end of each year, ground water monitoring data will be summarized and submitted to DOGM. The report will include an analysis of mine working water balance, accounting for mine inflows, outflows, consumptive uses and sump storage.

Compliance

The applicant's plan to monitor ground water in the mine permit and adjacent areas will be adequate to identify significant changes or impacts to the existing hydrologic balance due to mining activities in the Tract 2 Lease area. Additionally, the ground

water monitoring program proposed by the applicant adheres to the Guidelines for Establishment of Surface and Ground Water Monitoring Programs as prepared by DOGM. Therefore, the applicant is in compliance with this section.

Stipulations

None.

UMC 817.59 Coal Recovery - PGL

Existing Environment and Applicant's Proposal

The applicant states that the mining recovery is projected to be greater than 50 percent of the total in-place coal (Section 3.3.3.1, page 3-3).

Compliance

The applicant outlined the projected 50 percent recovery of the in-place coal. The Bureau of Land Management (BLM) approved the mining plan and the Resource Recovery and Protection Plan on October 11, 1985 (See letter attached to TA).

Stipulations

None.

UMC 817.71 Underground Development Waste and Excess Spoil and Nonacid and Nontoxic-forming Coal Processing - PGL

Existing Environment and Applicant's Proposal

The applicant states that all underground development waste in Tract 2 will be disposed of underground (Section 3.5.9, page 3-1 and Section 1.2, page 1-5). Therefore, this section is not applicable.

UMC 817.97 Protection of Fish, Wildlife and Related Environmental Values - LK

Existing Environment and Applicant's Proposal

The Tract 2 area is on a south facing, steep slope in Crandall Canyon and major vegetation types occurring on the area include sagebrush, mountain shrub/grassland and aspen (Plate 9-1). The entire Tract is within high priority deer and elk summer range (Plate 10-1). Several springs occur within and adjacent to the Tract 2 area which have been identified as being of critical value to wildlife.

The applicant has identified that the only additional impacts to wildlife from mining this area will come from subsidence (no additional surface disturbance planned) (Chapter 10, page 1). Proposed mitigation includes an employee education program presenting potential wildlife impacts and admonishing employees to avoid unnecessary disturbance and harassment of wildlife. In addition, the applicant is currently working on a mitigation plan with the Utah Division of Wildlife Resources (DWR) to mitigate impacts for losses of critical springs due to subsidence (Chapter 10, page 2).

Compliance

The applicant has provided sufficient wildlife information to identify potential impacts and has proposed acceptable mitigation with the exception of impacted seeps and springs. Even though the applicant is currently working on a mitigation plan with DWR, until this plan is finalized and included in the plan, the applicant is not in compliance. Therefore, the following stipulation is necessary for compliance.

Stipulation 817.97-(1)-LK

1. Within 60 days of final approval, the applicant must finalize a mitigation plan for impacted seeps and springs that is acceptable to the DWR and submit this plan to DOGM for review and approval.

UMC 817.121 Subsidence Control: General Requirements - DD

Existing Environment and Applicant's Proposal

The applicant has submitted complete plans (MRP Chapter 12) consistent with known technology to prevent subsidence from causing material damage to surface features and renewable resources, to the extent technologically and economically feasible. Subsidence is planned and will be maintained in a controlled manner. No adverse effects from subsidence will occur. Subsidence will be monitored annually in accordance with the USFS subsidence monitoring schedule (Item 12-12, MRP).

Compliance

The applicant complies with this section.

Stipulation

None.

UMC 817.122 Subsidence Control: Public Notice - DD

Existing Environment and Applicant's Proposal

The mine is located on and adjacent to federal lands and leases. Information concerning the mining sequence and subsidence potential has been submitted to the respective federal agencies.

Compliance

The applicant complies with this section.

Stipulation

None.

UMC 817.124 Subsidence Control: Surface Owner Protection - DD

Existing Environment and Applicant's Proposal

The applicant has submitted plans to conduct subsidence in a controlled manner (Chapter 12 Tract 2 MRP) to prevent reduced value or loss of reasonable forseeable use of surface lands. A survey completed by the applicant shows no buildings or other facilities in the area that can be affected by subsidence.

Compliance

The applicant has not completely addressed remedial action needed in the event surface features such as springs and wildlife habitat should become affected.

Stipulation 817.124-(1)-DD

Same as Stipulation UMC 817.97-(1)-LK.

UMC 817.126 Subsidence Control: Buffer Zone - DD

Existing Environment and Applicant's Proposal

Subsidence plans submitted by the applicant allow for buffer zones adjacent to perennial streams or significant water sources (public water supply). Plans show that aquifers will not be disrupted by subsidence and that no buildings, impoundments or facilities exist on the area to be undermined.

Compliance

The applicant is in compliance with this section.

Stipulation

None.

FILE: ACT/015/032 #2,3,4

SCOTT M. MATHESON
GOVERNOR

STATE OF UTAH
DEPARTMENT OF COMMUNITY AND
ECONOMIC DEVELOPMENT

Division of
State History
(UTAH STATE HISTORICAL SOCIETY)

MELVIN T. SMITH, DIRECTOR
300 RIO GRANDE
SALT LAKE CITY, UTAH 84101-1182
TELEPHONE 801/533-5755

September 27, 1984

James W. Smith, Jr.
Administrator
Mineral Resource Development
And Reclamation Program
Division of Oil, Gas & Mining
4241 State Office Building
Salt Lake City, Utah 841114

Attn: D. Wayne Hedberg

RE: Permit Application for Genwal Coal Company's Crandall Canyon Mine, Lease Tract #2, ACT/015/032, Folder No. 2, Emery County

In Reply Refer To Case No. H407

Dear Mr. Smith:

The Utah Preservation Office has received your letter of September 12, 1984, regarding the permit application for the Genwal Coal Company's Crandall Canyon Mine, Lease Tract #2.

After review of the documentation provided concerning cultural resources in the project area, our office would advise the Division of Oil, Gas & Mining that the approved Forest Service report would be adequate to include as evidence of a survey being completed of the project area, and that this report is complete and could be transmitted to the Office of Surface Mining.

Since no formal consultation request concerning eligibility, effect or mitigation as outlined by 36 CFR 800 was indicated by you, this letter represents a response for information concerning location of cultural resources. If you have any questions or concerns, please contact me at 533-7039.

Sincerely,

James L. Dykman
Cultural Resource Advisor
Office of State Historic
Preservation Officer

JLD:jrc:H407/0885V

UT0067

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
UTAH STATE OFFICE
324 SOUTH STATE, SUITE 301
SALT LAKE CITY, UTAH 84111-2303

IN REPLY REFER TO
3482
SL-062648
U-921

October 11, 1985

Betty-file

To: Richard Holbrook, OSM Senior Project Manager, State of Utah, Denver

Attn: Ron Naton

From: Chief, Solid Minerals and Mining Law

Subject: Genwal Coal Company, Crandall Canyon Mine, Emery County, Utah, Approved Mining Plan

The following subject information has been received in this office for review:

Two volumes forwarded with your letter dated September 12, 1985, and identified as "Mining and Reclamation Plan, Tract 2, Crandall Canyon Mine."

Pages forwarded with your letter dated September 20, 1985, and identified as "09/05/85 UT DOGM Transmittal of MRP amendment plans to increase coal production."

The above information has been reviewed for compliance with 43 CFR 3482.1(c), particularly the resource recovery and protection plan (R2P2) or underground mining part of the subject plan. We were also requested to note any conflicts with future recovery of coal resources.

The two-volume submittal appears to be a complete resubmittal of the volume identified as Lease Tract 2, reviewed in this office and commented on by our memorandum dated October 30, 1984.

The following are our comments on the new submittals listed above:

1. The two new Tract 2 volumes provide adequate information for the requirements of 43 CFR 3482.1(c) rules and regulations and to satisfy the concerns of our subject memorandum dated October 30, 1984.

2. The mining plan as submitted does not conflict with future recovery of coal resources.

3. Plate 3-2, "Mining Sequence by Future Permit." This print is not approved as submitted. At this time, the only coal lands that Genwal Company has a legal right to mine coal from are Tract 1 and Tract 2 as shown. All other lands shown will require that additional coal leases be issued. The emergency lease has been filed and is being considered.

4. Plate 3-1, "Crandall Canyon Mine Tract 2 Mining Plan Hiawatha Seam." Property barriers as shown are too large. These discrepancies can be adjusted and approved by BLM as mining progresses.

5. Plate XII-5, "Subsidence Limit." The angles of draw used on this drawing are larger than the angle of draw generally accepted for this coal field. Minable coal reserves, that are reduced because of an angle of draw involment, must have BLM participation and approval.

We have determined that the total plan submission, Tracts 1 and 2, are adequate for BLM administration of the associated Federal coal lease(SL-062648) and that maximum recovery can be achieved within the limits of the equipment and technology presented in the plan. We recommend approval of the underground mining part of the permit application for Tract 2 and the included parts of Tract 1 with reservations to negotiate, if necessary, barrier pillar sizes and angle of draw.

Jackson W. Moffitt

STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Dianne R. Nielson, Ph.D., Division Director

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

March 4, 1986

Mr. Allen Klein, Administrator
Office of Surface Mining
Brooks Towers
1020 15th Street
Denver, Colorado 80202

Dear Mr. Klein:

Re: Draft Decision Document, Genwal Coal Company, Crandall Canyon Mine, Lease Tract 2, ACT/015/032, Folder No. 2 and 4, Emery County, Utah

Enclosed is Utah's Draft Decision Document for the above-referenced mine. The Division of Oil, Gas and Mining has found that, with the addition of one stipulation, the applicant's proposal is adequatae to comply with the requirements of SMCRA and the Utah Program.

To date, DOGM has not received letters of concurrence from the U. S. Fish and Wildlife Service or the U. S. Forest Service. Please contact Lowell Braxton or Susan Linner as soon as questions or concerns are identified.

Best regards,

Dianne

Dianne R. Nielson
Director

SCL:jvb
cc: R. Holbrook
A. King
L. Braxton
D. Cline
D. Darby
L. Kunzler
S. Linner
0028R-75

CONTENTS

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FINDINGS

Genwal Coal Company
Crandall Canyon Mine
Lease Tract 2
ACT/015/032
Emery County, Utah

February 21, 1986

1. The application for the Tract 2 permit, updated through January 7, 1986 is accurate and complete and all requirements of the Surface Mining Control and Reclamation Act, and the Utah State program have been complied with (as required by UMC 786.19(a)). However, the Tract 2 application relies upon information present in the Mining and Reclamation Plan (MRP) for Tract 1. Tract 1 is currently undergoing a mid-term review. A new updated MRP has been submitted, but has not yet been approved.

2. The DOGM has performed a Technical Analysis (TA) and concluded that:

   A. No additional surface reclamation is required since the new lease will be mined as an underground extension of the existing mine. There will be no new surface facilities (UMC 786.19[b]).

   B. A cumulative hydrologic impacts assessment by DOGM for the Tract 2 Lease reveals that the operations have been designed to prevent damage to the hydrologic balance outside the permit area (see Cumulative Hydrologic Impact Assessment [CHIA] attached). The details of the type and extent of impacts are included in the CHIA (UMC 786.19[c]).

3. After reviewing the description of the proposed permit area and the application (Sections 1.2 and 2.5), the DOGM has determined that the area is:

   A. Not included within an area designated unsuitable for coal mining operations.

   B. Not within an area under study for designating lands unsuitable for coal mining operations.

   C. Not on any land subject to the prohibitions or limitations of 30 CFR 761.11(a) (national parks, etc.), 761.11(f) (public buildings, etc.) and 761.11(g) (cemetery).

   D. Not within 100 feet of the outside right-of-way of public roads.

E. Not within 300 feet of an occupied building (UMC 786.19[d]).

4. The issuance of a permit and the Secretarial decision on the Mineral Leasing Act plan are in compliance with the National Historic Preservation Act and implementing regulations (October 2, 1984 letter from SHPO, and personal communication, Jim Dykman, Divsion of State History, February 14, 1986) (UMC 786.19[e]).

5. The applicant has the legal right to enter and begin underground mining activities in the permit area. The applicant has provided information required by UMC 782.15(b) (MRP Section 2.4) (UMC 786.19[f]).

6. The applicant has submitted proof and the DOGM records indicate that prior violations of applicable laws and regulations have been corrected (DOGM NOV/CO Status Report, personal communication, Dave Lof, February 21, 1986) (UMC 786.19[g]).

7. The OSM records confirm that all fees for the Abandoned Mine Reclamation Fund have been paid (personal communication, John Sender, OSM Fee Compliance Officer) (UMC 786.19[h]).

8. The DOGM records show that the applicant does not control and has not controlled mining operations with a demonstrated pattern of willful violations of the Act of such nature, duration and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the provisions of the Act (UMC 786.19 [i]).

9. Coal mining and reclamation operations to be performed under the permit will not be inconsistent with other underground mines in the general vicinity. The only adjacent mine is the Huntington #4 Mine which has been closed and reclaimed (UMC 786.19 [j]).

10. The applicant has posted a surety bond for the Crandall Canyon Mine in the amount of $136,729.00. No additional Surety will be required for this modification since there is no additional surface disturbance proposed (UMC 786.19[k]).

11. The applicant has provided evidence and the DOGM has found that there are no prime farmlands in the permit area (MRP Section 2.5) (UMC 786.19[l]).

12. The DOGM has determined that there are no Alluvial Valley Floors (AVF) existing within the proposed permit area. There are no AVF's which may be negatively impacted by mining of Tract 2 (UMC 786.19[l]).

13. The proposed postmining land-use for the permit area has been approved by the DOGM and is the same as the premining land use (UMC 786.19[m]).

14. All specific approvals required by the Act, the Utah State Program and the Federal Lands Program have been made (UMC 786.19[n]).

15. The proposed operation will not affect the continued existence of threatened or endangered species or result in the destruction or adverse modification of their critical habitats. No surface disturbance will occur (UMC 786.19[o]).

16. All procedures for public participation required by the Act, and the approved Utah State Program have been complied with (UMC 786.23[a][2]).

Prior to the permit taking effect, the applicant must forward a letter stating its acceptance of the special stipulations in the permit.

Susan C. Linner
Permit Supervisor

Lowell P Braxton
Administrator, Mineral Resource
Development and Reclamation Program

Leonard E. Heap
Associate Director
Division of Oil, Gas and Mining

Barbara W. Roberts
Approved as to Form
Assistant Attorney General

Dianne R. Nielson
Director
Division of Oil, Gas and Mining

0688R

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT
Genwal Coal Company
Crandall Canyon Mine
ACT/015/032
Emery County, Utah

February 25, 1986

I. Introduction

The purpose of this report is to provide a Cumulative Hydrologic Impact Assessment (CHIA) for Genwal Coal Company's Crandall Canyon Mine located in Emery County, Utah. The assessment encompasses the probable cumulative impacts of all anticipated coal mining in the general area on the hydrologic balance and a determination of whether the operations proposed under the application have been designed to prevent damage to the hydrologic balance outside the proposed mine plan area. This report complies with federal legislation passed under the Surface Mining Control and Reclamation Act (SMCRA) and subsequent Utah and federal regulatory programs under UMC 786.19(c) and 30 CFR 784.14(f), respectively.

Genwal Coal Company's Crandall Canyon Mine is located along the eastern margin of the Wasatch Plateau Coal Field approximately 15 miles west of Huntington, Utah (Figure 1). The eastern margin of the Wasatch Plateau forms a rugged escarpment that overlooks Castle Valley and the San Rafael Swell to the east. Elevations along the eastern escarpment of the Wasatch Plateau range from approximately 6,500 to over 9,000 feet.

Outcropping rocks of the Wasatch Plateau Coal Field range from Upper Cretaceous to Quaternary in age. The rock record reflects an overall regressive sequence from marine (Mancos Shale) through littoral and lagoonal (Blackhawk Formation) to fluvial (Castlegate Sandstone, Price River Formation and North Horn Formation) and lacustrine (Flagstaff Formation) depositional environments. Oscillating depositional environments within the overall regressive trend are represented by lithologies within the Blackhawk Formation. The major coal-bearing unit within the Wasatch Plateau Coal Field is the Blackhawk Formation.

Precipitation varies from 40 inches at higher elevations to less than 10 inches at lower elevations. The Wasatch Plateau may be classified as semiarid to subhumid.

Vegetation varies from the Sagebrush/Grass community type at lower elevations to the Douglas Fir/Aspen community at higher elevations. Other vegetative communities include Mountain Brush, Pinyon-Juniper, Pinyon-Juniper/Sagebrush and Riparian. These communities are primarily used for wildlife habitat and livestock grazing.

Crandall Creek which flows past the Crandall Canyon Mine is a perennial tributary to Huntington Creek which is a tributary to the San Rafael River. The upper drainage of Huntington Creek encompasses about 200 square miles of mountainous country in the Wasatch Plateau. About 90 percent of the area is higher than 8,000 feet. The average channel gradient along Huntington Creek is about 100 feet per mile. The lower reaches of the tributaries to Huntington Creek typically have surface relief between the stream channels and tops of adjacent canyon walls of 2,000 feet or more.

II. Cumulative Impact Area (CIA)

Figure 2 delineates the current Crandall Canyon Mine operations and CIA. The CIA includes the Crandall Canyon drainage and a portion of Huntington Creek. The CIA boundary is defined on the north, south and west by the Crandall Canyon drainage divide and on the east by Huntington Creek. A first level analysis was conducted using these boundaries to determine hydrologic impacts. Completion of the review at this level indicated that cumulative hydrologic impacts did not exist within these limits. Therefore, further analysis was not conducted beyond these limits and the CIA was determined to be complete. The CIA encompasses approximately 4,565 acres.

III. Scope of Mining

Genwal Coal Company controls approximately 162 acres in Emery County, Utah, 77.53 acres of which is a new lease and will be referred to as Tract 2. Mining was conducted historically near this site from November, 1939 to September 1955. Mining in Tract 1 began in 1983. Approximately 811,000 tons of coal in place are estimated to exist in the Hiawatha Seam within the Tract 2 area. Production during the first year will be approximately 327,000 tons, with an average yearly production of 360,000 tons per year.

Access to the Tract 2 area will be by extending the existing Tract 1 North Main entries into the new permit area. All existing surface facilities on Tract 1 will be utilized to mine the Tract 2 lease and no new surface facilities will be constructed. Existing surface breakouts from the seam in Tract 1 for ventilation and haulage are made in Crandall Canyon and will be utilized for Tract 2 as well.

The current method of room and pillar mining in use on Tract 1 will be continued into Tract 2. Pillars will be removed upon abandonment of sections. Overall, an advance-retreat mining system is projected for Tract 2 with retreat mining employed prior to abandonment of each section.

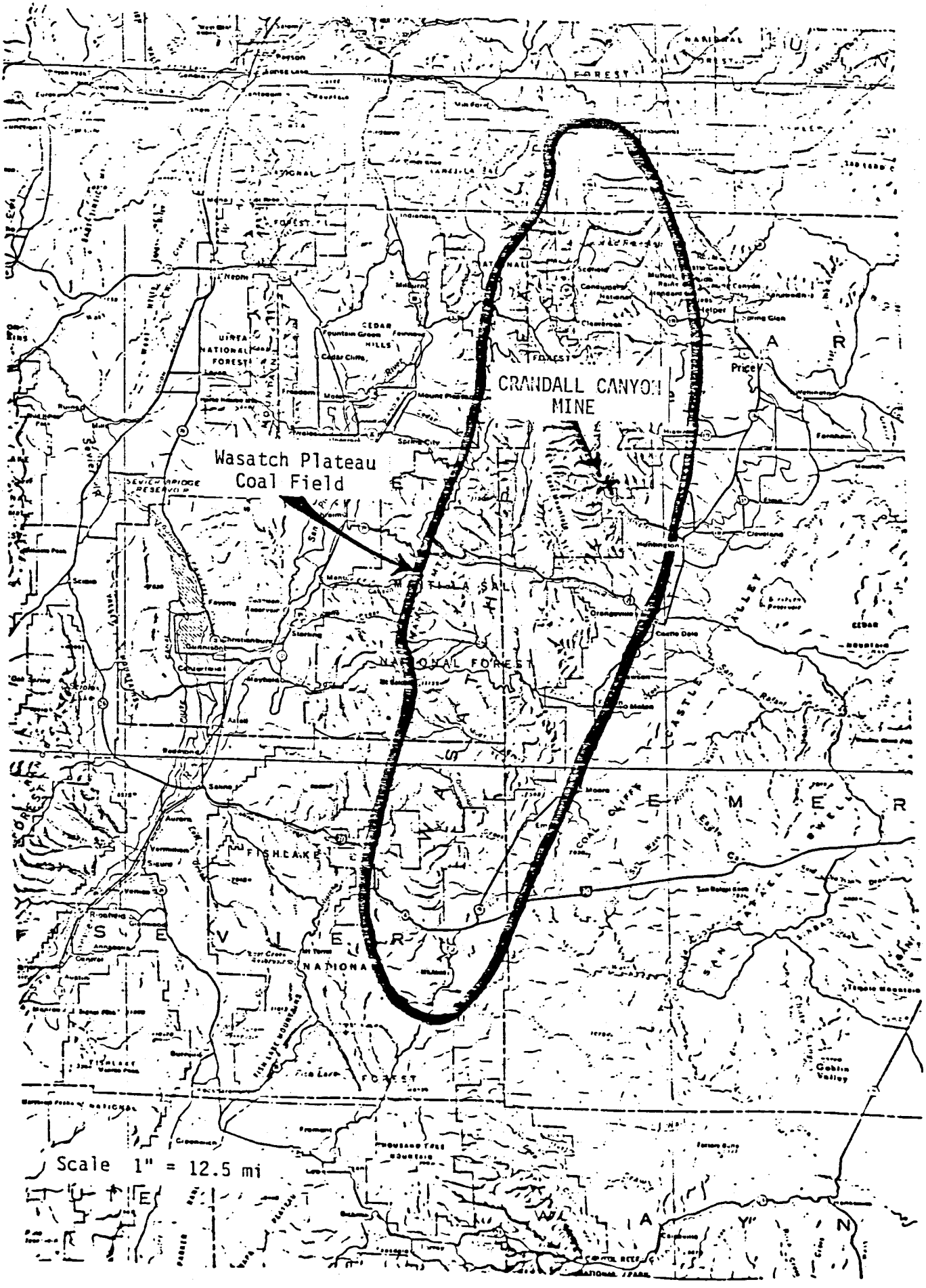
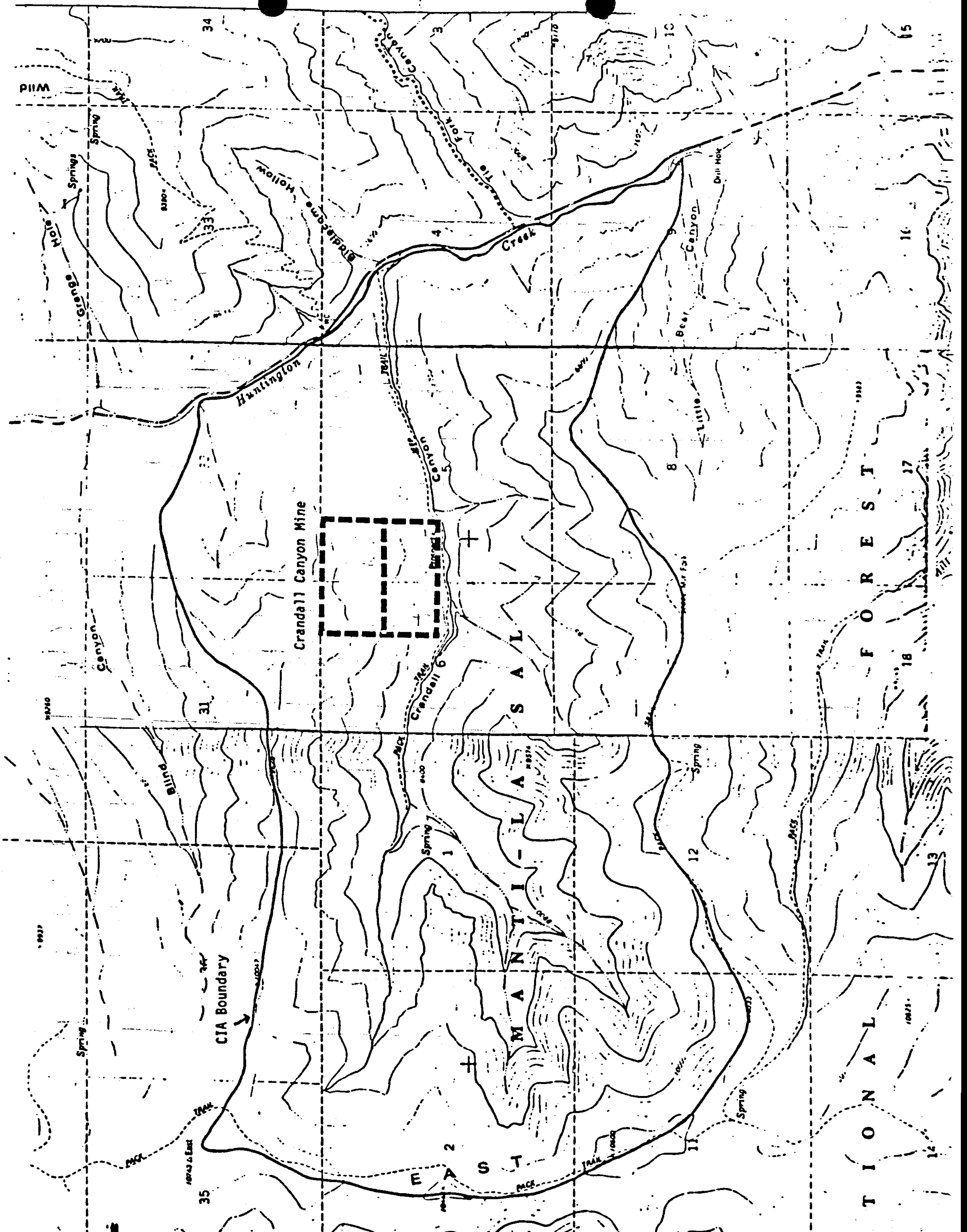


Figure 1. Wasatch Plateau Coal Field


Crandall Canyon Mine
CIA Boundary
Huntington
Creek
Crandall
Canyon
Little
Bear
Canyon
Blind
Canyon
Grange
Hole
Springs
Spring
Bleeding Hollow
Tie Fork Canyon
Wild
EAST
MANTI-LA SAL
NATIONAL FOREST
TRAIL
PACK
34
33
4
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9
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2
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14
35

FIGURE 2

The permit area is comprised of coal lands leased by Genwal Coal Company from the United States Bureau of Land Management, under lease SL-062648. The surface lands are controlled by the United States Forest Service, Manti-LaSal National Forest.

The amount of reserves within the permit area is mineable within two years, however, access will be maintained through this permit area until all future reserves to the northwest and west are mined. At the present time Genwal Coal Company holds no further leases, however, an emergency lease application has been submitted for an additional 256 acres.

IV. Study Area

A. Geology

The formations exposed in the Wasatch Plateau are Tertiary and Cretaceous-aged sedimentary units. These formations are of both continental and marine origin and are comprised principally of shale and sandstone. Siltstone, mudstone and limestone occur in lesser amounts. The formations in the Wasatch Plateau area generally dip one to three degrees westward off the west flank of the San Rafael Swell. Superimposed over the region are numerous synclines, anticlines and fault zones. The syncline and anticline areas have predominant east-west orientation, while the fault zones are generally oriented north-south.

Stratigraphic units outcropping within the study area include, from oldest to youngest, the Masuk Shale Member of the Mancos Shale, Starpoint Sandstone, Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation and Quaternary deposits. Lithologic descriptions and unit thicknesses are shown in Figure 3.

The Hiawatha Coal Seam, which is the coal seam to be mined in the Tract 2 area, occurs at the base of the Blackhawk Formation. The Hiawatha Coal Seam has been mined in the Tract 1 Lease and is exposed at an approximate elevation of 7900 feet. Maximum overburden is approximately 1500 feet in the northwest corner of the Tract 2 Lease with an average overburden of approximately 800-900 feet. The entire permit area is underlain by the Starpoint Sandstone.

B. Topography and Precipitation

Topography in the area is generally very steep and rugged with elevations ranging from approximately 7,200 feet to over 10,000 feet above sea level. Slopes vary from vertical cliffs to less than 2 percent. The CIA is characterized by Crandall Canyon Creek, which originates above 10,000 feet and drains east into Huntington Creek. The CIA also includes an unnamed ephemeral drainage to the west of the permit area that also drains to the east into Huntington Creek.

System	Series	Stratigraphic Unit	Thickness (feet)	Lithology and water-bearing characteristics
Quaternary	Holocene and Pleistocene	Quaternary deposits	0-100	Alluvium and colluvium; clay, silt, sand, gravel, and boulders; yields water to springs that may cease to flow in late summer.
Tertiary	Paleocene	North Horn Formation	800±	Variegated shale and mudstone with interbeds of tan-to-gray sandstone; all of fluvial and lacustrine origin; yields water to springs.
Cretaceous	Upper Cretaceous	Price River Formation	600-700	Gray-to-brown, fine-to-coarse, and conglomeratic fluvial sandstone with thin beds of gray shale; yields water to springs locally.
		Castlegate Sandstone	150-250	Tan-to-brown fluvial sandstone and conglomerate; forms cliffs in most exposures; yields water to springs locally.
		Blackhawk Formation	600-700	Tan-to-gray discontinuous sandstone and gray carbonaceous shales with coal beds; all of marginal marine and paludal origin; locally scour-and-fill deposits of fluvial sandstone within less permeable sediments; yields water to springs and coal mines, mainly where fractured or jointed.
		Star Point Sandstone	350-450	Light-gray, white, massive, and thin-bedded sandstone, grading downward from a massive cliff-forming unit at the top to thin interbedded sandstone and shale at the base; all of marginal marine and marine origin; yields water to springs and mines where fractured and jointed.
		Mancos Shale	600-800	Dark-gray marine shale with thin, discontinuous layers of gray limestone and sandstone; yields water to springs locally.

Figure 3. Stratigraphy of the Crandall Canyon Mine Area (modified from Danielson, et al 1981).

Precipitation in the Wasatch Plateau ranges from 10 inches to 40 inches annually. Average annual precipitation in the CIA is approximately 20 inches (Simons 1984).

C. Vegetation

There are five vegetative communities in the CIA including Sagebrush, Mountain Shrub/Grassland, Mixed Mountain Shrub, Conifer/Aspen and Spruce/Fir. Aspen are found on the north facing south slopes and higher up on the north slopes, on ridge tops. Spruce/Fir is also found on the north slopes and appears to be tied to both a moister site as well as areas with less sunlight. Mixed Mountain Shrub and Mountain Shrub/Grassland appear to be transitional and are predominant on the open exposed ridges at approximately mid-slope. The Sagebrush community follows primarily along the ridges and is more than likely climax in nature to the shrub grass associations.

V. Hydrologic Resources

A. Ground Water

The principle factor controlling the occurences and availability of ground water in any area is geology. The ground water regime within the CIA is dependent upon geologic and climatic parameters that establish systems of recharge, movement and discharge.

Snowmelt at higher elevations provides most of the groundwater recharge, particularly where permeable lithologies or faults/ fractures are exposed at the surface. Vertical migration of ground water occurs through permeable rock units and/or along zones of faulting and fracturing. Lateral migration initiates when ground water encounters impermeable rocks and continues until either the land surface is intersected (and spring discharge occurs) or other permeable lithologies or zones are encountered that allow further vertical flow.

A seep and spring survey conducted by Earthfax Engineering in June and October of 1985 revealed the following information concerning the geology and aquifer characteristics in the vicinity of the mine.

Six formations outcrop in and adjacent to the Tract 2 area. According to Doelling (1972), the Masuk Shale Member of the Mancos Shale is a light gray to blue-gray marine sandy shale in the mine vicinity. This unit is exposed at the mouth of Crandall Canyon and in adjacent areas along Huntington Creek. The Masuk Shale Member yields water locally to seeps and springs but does not serve as a regionally important aquifer (Danielson et al., 1981).

The Star Point Sandstone is predominantly a light gray massive sandstone with minor interbedded layers of shale and siltstone near its base (Doelling, 1972). In the vicinity of the mine, the Star Point Sandstone is approximately 300 feet thick. The Star Point serves as an important regional aquifer (Danielson et al., 1981), yielding water to several minor and some major springs where fractured and jointed.

The Blackhawk Formation is the principal coal-bearing unit in the region (Doelling, 1972). This formation consists of interbedded layers of sandstone, siltstone, shale, and coal, all of marine origin. The Blackhawk is approximately 700 feet thick in the mine area, with the principal coal seam (the Hiawatha seam) occurring near the bottom of the formation. The formation yields water to springs and coal mines when fractured. Where it is locally interbedded with the Star Point Sandstone, the lower portion of the Blackhawk Formation is considered an aquifer (Danielson et al., 1981).

The Castlegate Sandstone overlies the Blackhawk Formation and consists of tan to brown cliff-forming sandstones of fluvial origin. The sandstones are massive and medium- to coarse-grained. In the area of the mine, the Castlegate yields water locally to seeps and springs but does not serve as an important regional aquifer because it is commonly drained within short distances from its recharge area due to deeply incised canyons (Danielson et al., 1981).

The Price River Formation consists predominantly of friable limey sandstone interbedded with pebbly conglomerates and shales. It forms steep receding slopes and reaches a maximum thickness of about 500 feet in the mine area (Doelling, 1972). This formation yields water locally to seeps and springs (Danielson et al., 1981). However, like the Castlegate Sandstone, deeply incised canyons in the area prevent the Price River Formation from being an important regional aquifer.

The uppermost formation that outcrops within the area adjacent to the mine plan area is the North Horn Formation. This formation consists of interbedded limestones, sandstones, and shales (Doelling, 1972). Due to high topographic presence, the North Horn Formation in the CIA serves primarily as a recharge unit to underlying formations rather than as an important source of water itself.

Investigations by Danielson et al. (1981) indicated that most, if not all, ground water in the region is derived from snowmelt. Recharge tends to be limited in areas underlain by the Price River Formation and older rocks (relative to recharge in areas underlain by younger rocks) due to slope steepness and relative imperviousness (both of which promote runoff rather than infiltration of snowmelt).

Detailed potentiometric surface data are not available for the CIA, however, the deeply incised canyons interrupt the flow of ground water in much of the area. Danielson et al. (1981) suggest that goundwater generally moves from high areas of recharge to low areas of drainage, principally along stream channels. This flow pattern is altered locally where geologic structure plays a dominant role.

The predominant chemical constituents in most springs in the region are calcium and bicarbonate (Danielson et al., 1981). Dissolved solids concentrations generally range from about 50 to 750 milligrams per liter. Regionally, the concentrations of major dissolved constituents in water from individual geologic units is highly variable, due to the complex lithologic nature of the area (Danielson et al., 1981).

Over 50 percent of the seeps and spring discovered during the June inventory issued from the Blackhawk Formation. However, flow rates at these points were normally minimal (less than one gallon per minute), with seepage issuing predominantly at the interface between sandstone lenses above and less permeable shale layers below. Most of these seeps and springs had dried up prior to the October survey. Useage at these points of seepage is minimal, due to the low flow rate and inaccessibility of the seeps.

The low seepage rates measured in most of the seeps and springs issuing from Blackhawk Formation are due to the low hydraulic conductivity of the formation in its unfractured state. Laboratory permeability data provided by Lines (1985) from a core sample collected in Section 27, T. 17 S., R. 6 E. (approximately 10 miles south of the mine permit area) indicate that sandstone units within the Blackhawk Formation have an average horizontal hydraulic conductivity of 1.3×10^{-2} feet per day and an average vertical hydraulic conductivity of 3.8×10^{-3} feet per day. Shales and siltstones within the Blackhawk Formation were found to have maximum horizontal and vertical hydraulic conductivities of 1.0×10^{-7} and 1.2×10^{-6} feet per day, respectively.

The relatively large hydraulic conductivity of the sandstones of the Blackhawk Formation compared with the siltstone and shales indicates that the fine grained sediments of the formation serve as barriers to the downward movement of water. In simple terms, as water recharges the Blackhawk Formation (either through snowmelt, rainfall, or subsurface seepage from an adjacent formation), it is permitted to percolate downward within the sandstone beds. However, upon reaching a less permeable siltstone or shale layer, the water is forced to flow horizontally to the surface, issuing at the interface between the two units.

Notable exceptions to the above generality concerning the Blackhawk Formation occur at a few springs that issue from fractured sandstone within the formation. Examples of this phenomenon were found in the western portion of the survey area, where flow rates of up to 15 gallons per minute were encountered during both the June and October inventories. Travertine deposits are common at these springs, suggesting that the recharge area for these springs is dominated by limestone (probably the North Horn Formation on the ridges to the north and west). The Blackhawk Formation apparently serves more as a conveyance body rather than a significant source of water to these springs.

Several seeps and springs issue at the site from colluvium overlying sandstone of the Blackhawk Formation and the Castlegate Sandstone. These seeps normally occur in drainage bottoms where shallow subsurface water collects at topographic lows. Nearly all flows from seeps of this type were insignificant in both June and October, suggesting (together with the topographic position) that these seeps are intermittent in nature.

Most seeps and springs issuing within the survey area from the Castlegate and Star Point Sandstones flow from bedding planes within these formations. Flows issuing in this manner were generally low during the June inventory (less than one gallon per minute) and nonexistent during the October inventory.

As noted, flow rates measured during the October survey were generally significantly less than those found during the June survey. In June, a total of 80 seeps or springs were found, 34 of which had sufficient flow to sample (the remaining 46 were seeps that could not be sampled). In October, 55 of the sources originally discovered were dry. An additional 7 sources existed only as seeps, with only 18 of the original sources containing sufficient flow to sample.

The results of the seep and spring inventory tend to support the conclusion of Danielson et al. (1981) that groundwater occurs in most geologic formations at the site (all but the Masuk Shale Member of the Mancos Shale), but none of the units are saturated everywhere. No continuous zones of saturation appear to be present at the site, indicating that potentiometric surface maps would be difficult to prepare. Based on the conclusions of Danielson et al. (1981), it is assumed that groundwater within the permit and adjacent areas flows toward the main canyons (Crandall, Blind, and Huntington) and then along Huntington Canyon to the valley bottom.

The data indicates that the specific conductance of water issuing from springs in June generally increased with increasing stratigraphic depth. This is in agreement with findings of Danielson et al. (1981). Springs issuing from the Price River

Formation typically had a specific conductance during the June survey that varied from 150 to 450 umhos/cm at 25°C while those issuing from the Blackhawk Formation and Star Point Sandstone had a specific conductance varying from 500 to 1000 umhos/cm at 25°C. This increase in specific conductance is indicative of leaching of minerals by the groundwater as it flows through increasing distances of bedrock to the lower stratigraphic positions.

The pH of water issuing from springs in the survey area showed no trends within or between formations. Values varied from 6.80 to 8.57, averaging 7.74. Hence, spring water in the study area is slightly alkaline.

In those springs with sufficient water to sample, pH generally increased slightly between June and October. Increases normally amounted to 0.1 to 0.5 pH unit. Specific conductance showed no consistent pattern between the June and October data, with approximately as many increases as decreases between June and October.

Inflow to the existing underground workings amounts to approximately 100 gallons per minute. These inflows originate primarily in gob sections near the working face of the mine. Currently, water encountered in the mine is used underground in the mining process.

B. Surface Water

Crandall Canyon is an east-flowing tributary of Huntington Creek, one of the major tributaries of the San Rafael River. Huntington Creek had annual flows near Huntington ranging from 25,000 to 150,000 acre-feet during the period of October 1931 through September 1973, averaging 65,000 acre-feet per year (Waddell et al., 1981). Variations in the annual flow of Huntington Creek near Huntington are portrayed graphically in Figure 4.

Approximately 50 to 70 percent of streamflow in the mountain streams of the region occurs during May through July (Waddell et al., 1981). Streamflow during this late spring/early summer period is the result of snowmelt runoff. Such seasonal variations are common for streams in the area (Waddell et al., 1981).

The quality of water in Huntington Creek and other similar streams in the area varies significantly with distance downstream. Waddell et al. (1981) found that concentrations of dissolved solids varied from 125 to 375 milligrams per liter in reaches above major diversions to 1600 to 4025 milligrams per liter in reaches below major irrigation diversions and population centers. The major ions at the upper sites were found to be calcium, magnesium, and bicarbonate, whereas sodium and sulfate became more dominant at the

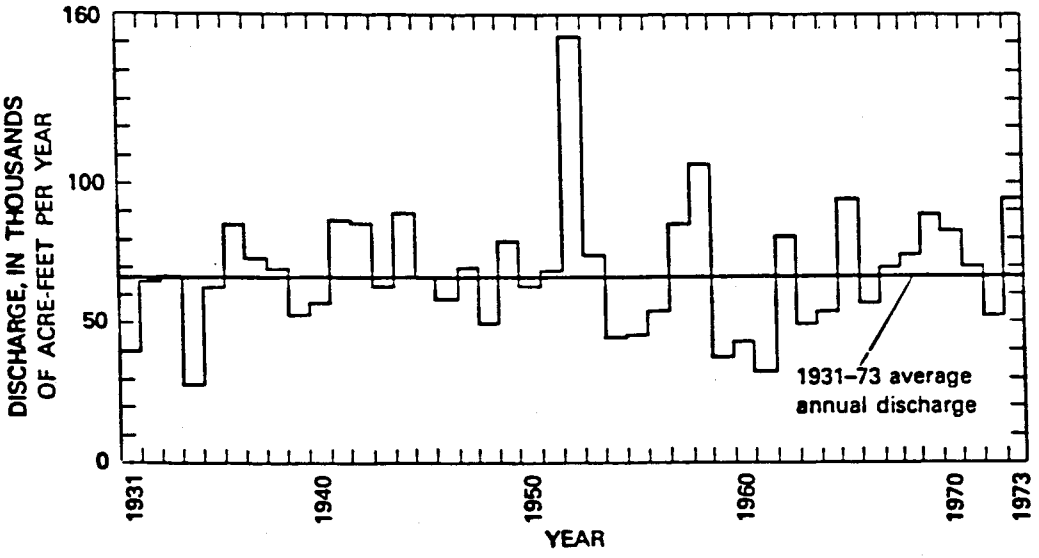

Figure 4 Annual discharge of Huntington Creek near Huntington (from Waddell et al., 1981).

lower sites. They attributed these changes to (1) diversion of water containing low dissolved solids concentrations, (2) subsequent irrigation and return drainage from moderate to highly saline soils, (3) groundwater seepage, and (4) inflow of sewage and pollutants from population centers.

Average annual sediment yields within the Huntington Creek drainage basin range from approximately 0.1 acre-feet per square mile in the headwaters area to about 3.0 acre-feet per square mile near the confluence with the San Rafael River (Waddell et al., 1981). Increases in sediment yield with increasing distance downstream is generally the result of increasing amounts of shale and sandstone in the downstream direction (Waddell et al., 1981).

The U. S. Geological Survey established a gaging station at the mouth of Crandall Creek in 1978. Flow data collected at the gaging station are not complete for the winter in most years, due presumably to data acquisition problems. However, the limited data indicate that most of the flow of Crandall Creek occurs in the period of May through July, in keeping with the conclusions of Waddell et al. (1981). Assuming an average of 30 acre-feet per month for the period of missing record, the average annual flow for the six year period of data was 2740 acre-feet.

Surface water quality data collected from Crandall Creek by Genwal for the Tract 1 Lease from 1985 indicate that the dominant ions in Crandall Creek are calcium and bicarbonate. Total dissolved solids concentrations in the stream have varied from 180 to 286 milligrams per liter, with lower concentrations normally occuring during the high flow season. Total suspended solids concentrations in Crandall Creek have varied during the period of record from /0.5 to 208.0 milligrams per liter. As expected, the highest suspended solids concentrations generally occur during periods of highest flow.

Vi. Potential Hydrologic Impacts

A. Ground Water

Dewatering and subsidence related to mining have the greatest potential for impacting groundwater resources in the CIA.

Dewatering

Inflow into the existing underground workings amounts to approximately 100 gallon per minute. These inflows originate primarily in gob sections near the working face of the mine. Currently, water encountered in the mine is used underground in the mining process. Continued interception of mine inflow may potentially dewater certain

localized aquifers not only during the first five year permit term but also throughout the life-of-mine as the workings are further developed.

Subsidence

Subsidence impacts are largely related to extension and expansion of the existing fracture system and upward propagation of new fractures. Inasmuch as vertical and lateral migration of water appears to be largely controlled by fracture conduits, readjustment or realignment in the conduit system may potentially produce changes in the configuration of ground-water flow. Potential changes include increased flow rates along fractures that have "opened" and diverting flow along new fractures or permeable lithologies. Subsurface flow diversions may cause the depletion of water in certain localized aquifers, whereas increased flow rates along fractures would reduce ground-water residence time and potentially improve water quality.

Therefore, mining in the Tract 2 Lease may dewater certain localized aquifers and affect flow rates along existing or new subsidence related fractures. However, these impacts will be localized near the mine permit area. No other ground water disturbances exist within the CIA and cumulative hydrologic impacts are not expected.

B. Surface Water

The main concern in terms of impact to surface water is water quality deterioration downstream from the minesite, primarily in the form of suspended sediments. Typically the suspended sediment concentration in Crandall Canyon Creek since 1983 varied from approximately 205 mg/l to 0.5 mg/l. The low suspended sediment values are associated with natural climatic and geologic process although a proportion may be attributed to surface disturbances from roads and the mine pad area. Sediment controls do exist for the disturbed surface areas. Therefore, the impact associated with mining in Crandall Canyon is minimized by surface controls (i.e., sediment pond, diversions, etc.). No other surface disturbances due to mining occur within the CIA and therefore cumulative hydrologic impacts are not expected.

The operational design proposed for the Crandall Canyon Mine is herein determined to be consistent with preventing damage to the hydrologic balance outside the mine plan area.

REFERENCES

Danielson, T. W., M.D. ReMillard, and R. H. Fuller. 1981 Hydrology of the Coal-Resource Areas in the Upper Drainages of Huntington and Cottonwood Creeks, Cental Utah. U. S. Geological Survey Water-Resources Investigations Open-File Report 81-539. Salt Lake City, Utah

Doelling, H. H. 1972. Central Utah Coal Fields: Sevier-Sanpete, Wasatch Plateau, Book Cliffs, and Emery. Utah Geological and Mineral Survey Monograph Series No. 3. Salt Lake City, Utah.

Lines, G. C. 1983. Water Resources Division, U. S. Geological Survey, Salt Lake City, Utah. Personal communication.

Simons, Li and Associates. 1984. Cumulative Hydrologic Impact Assessment Huntington Creek Basin, Emery County, Utah. Fort Colline, Colorado

Waddell, K. M., P. K. Contrato, C. T. Sumsion, and J. R. Butler. 1981. Hydrologic Reconnaissance of the Wasatch Plateau-Book Cliffs Coal-Fields Area, Utah. U. S. Geological Survey Water Supply Paper 2068. Washington, D. C.

STIPULATIONS

Genwal Coal Company
Crandall Canyon Mine
Lease Tract 2
ACT/015/032
Emery County, Utah

February 24, 1986

Stipulation 817.97-(1)-LK

1. Within 60 days of final approval, the applicant must finalize a mitigation plan for impacted seeps and springs that is acceptable to the DWR and submit this plan to DOGM for review and approval.

0682R-9

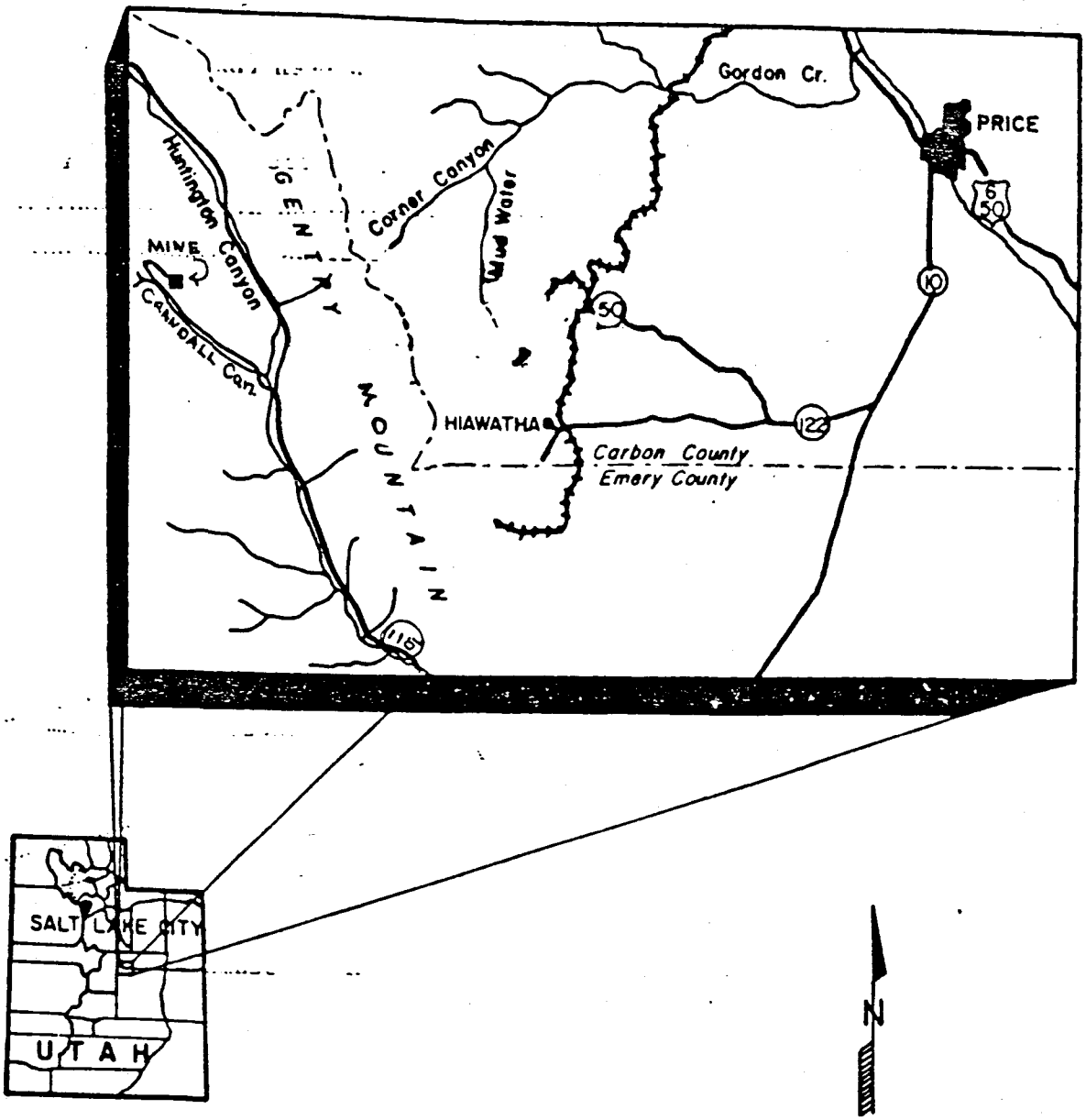

FIGURE 1-1

LOCATION MAP

Genwal Coal Company
Crandall Canyon Mine
Emery County, Utah

TECHNICAL ANALYSIS

Genwal Coal Company
Crandall Canyon Mine, Lease Tract 2
ACT/015/032, Emery County, Utah

February 24, 1986

Introduction

Genwal Coal Company proposes to add 77.53 acres to its currently approved permit area for the Crandall Canyon Mine. The additional acreage comprises a portion of Federal Lease SL-062648. The surface lands are controlled by the U. S. Forest Service (USFS), Manti-LaSal National Forest.

The Mining and Reclamation Plan (MRP) for the Crandall Canyon Tract 1 permit, which comprises the remainder of Federal Lease SL-062648, a small fee lease and a USFS Special Use Area for a total of 86.84 acres, was approved by the Office of Surface Mining (OSM) November 24, 1984 and by the Division of Oil, Gas and Mining (DOGM) May 13, 1983.

The new permit application area is estimated to contain 811,000 tons of coal in place in the Hiawatha seam. Access to this permit area will be gained by extending the North Main entries underground from the Tract 1 permit area. The current method of room-and-pillar mining will continue to be used. Mining of the new tract will be accomplished through use of the surface facilities built or approved to be built for the Tract 1 permit area. No additional surface disturbance will be required to mine Tract 2.

Genwal Coal Company (Genwal) submitted a permit application for Lease Tract 2 on July 18, 1984. Due to repermitting efforts, DOGM did not complete its Initial Completeness Review (ICR) until July 10, 1985. Genwal submitted a revised Lease Tract 2 application on August 16, 1985. DOGM responded with a Determination of Completeness (DOC) review on September 27, 1985. Genwal submitted additional information on November 6, 1985 which DOGM responded to with another DOC review letter on November 25, 1985. Genwal submitted additional information on December 26, 1985 and January 7, 1986. The plan was determined complete on January 10, 1986.

The following technical sections include an analysis of how Genwal Coal Company will comply with specific performance standards applicable to the MRP proposed for the Tract 2 permit area. Compliance with all other performance standards was determined to be the same as in the previously approved MRP and associated Technical Analysis (TA).

UMC 817.48 Hydrologic Balance: Acid-forming and Toxic-forming Materials - PGL

Existing Environment and Applicant's Proposal

The applicant stated on page 1-5 that development waste will not be brought to the surface. Therefore, no drainage from acid-forming and toxic-forming underground development waste will be exposed at the surface.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.50 Underground Mine Entry and Access Discharges - DC

Existing Environment and Applicant's Proposal

The applicant has stated that inflow to the existing underground workings in the Tract 1 Lease amounts to approximately 100 gallons per minute. The mine water inflow originates primarily in gob sections near the working face of the mine. Currently, water encountered in the mine is used underground in the mining process. The applicant is currently in the process of obtaining a NPDES permit to cover discharge from the mine in the event that larger quantities of ground water are encountered than can be utilized underground.

Compliance

The applicant's proposal meets the general requirements of this section.

Stipulations

None.

UMC 817.52 Surface and Ground Water Monitoring - DC

Existing Environment and Applicant's Proposal

Surface Water

The applicant has provided U. S. Geological Survey (USGS) surface water flow and quality data for Crandall Canyon Creek to establish baseline conditions for this area (Section UMC 783.16, items M and N, "Response to Apparent Completeness Review," September 1981).

Two 36-inch Parshall flumes were installed in July 1985 on Crandall Creek as indicated on Figure 7-7, Tract 2 MRP, August 16, 1985 (one upstream from the surface facilities and one downstream). These flumes have been equipped with Stevens Type-F water level recorders to allow the collection of continuous flow data.

Water quality samples will be collected from the flume locations quarterly (normally in January, April, July and October) and analyzed according to the list contained in Table 7-6, Tract 2 MRP, August 16, 1985. Every fifth year (1985, 1990, etc.), the samples collected during the low flow period will be analyzed according to Table 7-7 (Tract 2 MRP, August 16, 1985). Surface water monitoring data will be submitted to DOGM on a quarterly basis. At the end of each calendar year, an annual summary describing variations in flows and quality will be submitted.

Discharges from the sedimentation pond will be analyzed in accordance with the NPDES permit for the facility.

Compliance

The applicant's plan to monitor surface water in Crandall Creek will be adequate to identify significant changes and impacts to the existing surface water regime due to mining in the Tract 2 Lease. The surface facility configuration will not change due to the mining in the Tract 2 Lease. Additionally, the surface water monitoring program proposed by the applicant adheres to the Guidelines for Establishment of Surface and Ground Water Monitoring Programs as prepared by DOGM. Therefore, the applicant is in compliance with this section.

Stipulations

None.

Existing Environment and Applicant's Proposal

Ground Water

The applicant has proposed a ground water monitoring program based on the results of a seep and spring survey conducted in June and October of 1985, Tract 2 MRP, August 16, 1985. Only one spring was found during the June 1985 survey within the area of potential subsidence with a flow rate of at least one gallon per minute. This spring is located above the Tract 1 Lease and should not be affected by mining in the Tract 2 Lease. All major springs (flows of at least five gallons per minute) found during the June 1985 survey were located outside the area of potential subsidence.

Ground water monitoring for the Crandall Canyon Mine area will consist of collecting water quality and quantity data from six springs located within and adjacent to the mine permit area as well as points of significant inflow to the underground workings. The proposed locations of the springs are shown on Figure 7-2, Tract 2 MRP, August 16, 1985.

The monitoring points are located both within the area of potential subsidence and at a distance from the mine to serve as indicators of long-term changes in ground water issuing from the Blackhawk Formation. In addition, one spring issuing from the overlying Castlegate Sandstone will be monitored because of its close proximity to the mine workings and because a water right has been filed on this spring by the U. S. Forest Service (USFS).

Four samples will be collected from the monitored springs annually. With the exception of the spring located within the area of potential subsidence, each spring will be monitored at monthly increments during the accessible portion of the year (generally June through September). Samples will be analyzed according to the list of parameters on Table 7-3, Tract 2 Lease MRP, August 16, 1985. The spring located within the area of potential subsidence is accessible year-round and will, therefore, be monitored quarterly (January, April, July and October) according to Table 7-3, Tract 2 Lease MRP, August 16, 1985. Every fifth year (1985, 1990, etc.), samples collected during the low flow period will be analyzed according to the list of parameters contained in Table 7-4, Tract 2 Lease MRP, August 16, 1985.

On a quarterly basis (normally January, April, July and October) an inventory will be conducted of the active portion of the mine to identify the location and geologic occurrence of mine inflows that exceed three gallons per minute. In consultation with DOGM, certain of these inflows will be selected for continued monitoring. After selection of the inflow points to be monitored, data will be collected on a quarterly basis and analyzed according to Table 7-3, Tract 2 Lease MRP, August 16, 1985.

At the end of each year, ground water monitoring data will be summarized and submitted to DOGM. The report will include an analysis of mine working water balance, accounting for mine inflows, outflows, consumptive uses and sump storage.

Compliance

The applicant's plan to monitor ground water in the mine permit and adjacent areas will be adequate to identify significant changes or impacts to the existing hydrologic balance due to mining activities in the Tract 2 Lease area. Additionally, the ground

water monitoring program proposed by the applicant adheres to the Guidelines for Establishment of Surface and Ground Water Monitoring Programs as prepared by DOGM. Therefore, the applicant is in compliance with this section.

Stipulations

None.

UMC 817.59 Coal Recovery - PGL

Existing Environment and Applicant's Proposal

The applicant states that the mining recovery is projected to be greater than 50 percent of the total in-place coal (Section 3.3.3.1, page 3-3).

Compliance

The applicant outlined the projected 50 percent recovery of the in-place coal. The Bureau of Land Management (BLM) approved the mining plan and the Resource Recovery and Protection Plan on October 11, 1985 (See letter attached to TA).

Stipulations

None.

UMC 817.71 Underground Development Waste and Excess Spoil and Nonacid and Nontoxic-forming Coal Processing - PGL

Existing Environment and Applicant's Proposal

The applicant states that all underground development waste in Tract 2 will be disposed of underground (Section 3.5.9, page 3-1 and Section 1.2, page 1-5). Therefore, this section is not applicable.

UMC 817.97 Protection of Fish, Wildlife and Related Environmental Values - LK

Existing Environment and Applicant's Proposal

The Tract 2 area is on a south facing, steep slope in Crandall Canyon and major vegetation types occurring on the area include sagebrush, mountain shrub/grassland and aspen (Plate 9-1). The entire Tract is within high priority deer and elk summer range (Plate 10-1). Several springs occur within and adjacent to the Tract 2 area which have been identified as being of critical value to wildlife.

The applicant has identified that the only additional impacts to wildlife from mining this area will come from subsidence (no additional surface disturbance planned) (Chapter 10, page 1). Proposed mitigation includes an employee education program presenting potential wildlife impacts and admonishing employees to avoid unnecessary disturbance and harassment of wildlife. In addition, the applicant is currently working on a mitigation plan with the Utah Division of Wildlife Resources (DWR) to mitigate impacts for losses of critical springs due to subsidence (Chapter 10, page 2).

Compliance

The applicant has provided sufficient wildlife information to identify potential impacts and has proposed acceptable mitigation with the exception of impacted seeps and springs. Even though the applicant is currently working on a mitigation plan with DWR, until this plan is finalized and included in the plan, the applicant is not in compliance. Therefore, the following stipulation is necessary for compliance.

Stipulation 817.97-(1)-LK

1. Within 60 days of final approval, the applicant must finalize a mitigation plan for impacted seeps and springs that is acceptable to the DWR and submit this plan to DOGM for review and approval.

UMC 817.121 Subsidence Control: General Requirements - DD

Existing Environment and Applicant's Proposal

The applicant has submitted complete plans (MRP Chapter 12) consistent with known technology to prevent subsidence from causing material damage to surface features and renewable resources, to the extent technologically and economically feasible. Subsidence is planned and will be maintained in a controlled manner. No adverse effects from subsidence will occur. Subsidence will be monitored annually in accordance with the USFS subsidence monitoring schedule (Item 12-12, MRP).

Compliance

The applicant complies with this section.

Stipulation

None.

UMC 817.122 Subsidence Control: Public Notice - DD

Existing Environment and Applicant's Proposal

The mine is located on and adjacent to federal lands and leases. Information concerning the mining sequence and subsidence potential has been submitted to the respective federal agencies.

Compliance

The applicant complies with this section.

Stipulation

None.

UMC 817.124 Subsidence Control: Surface Owner Protection - DD

Existing Environment and Applicant's Proposal

The applicant has submitted plans to conduct subsidence in a controlled manner (Chapter 12 Tract 2 MRP) to prevent reduced value or loss of reasonable forseeable use of surface lands. A survey completed by the applicant shows no buildings or other facilities in the area that can be affected by subsidence.

Compliance

The applicant has not completely addressed remedial action needed in the event surface features such as springs and wildlife habitat should become affected.

Stipulation 817.124-(1)-DD

Same as Stipulation UMC 817.97-(1)-LK.

UMC 817.126 Subsidence Control: Buffer Zone - DD

Existing Environment and Applicant's Proposal

Subsidence plans submitted by the applicant allow for buffer zones adjacent to perennial streams or significant water sources (public water supply). Plans show that aquifers will not be disrupted by subsidence and that no buildings, impoundments or facilities exist on the area to be undermined.

Compliance

The applicant is in compliance with this section.

Stipulation

None.

FILE: ACT/015/032 #2,3,4

September 27, 1984

SCOTT M. MATHESON
GOVERNOR

STATE OF UTAH
DEPARTMENT OF COMMUNITY AND
ECONOMIC DEVELOPMENT

Division of
State History
(UTAH STATE HISTORICAL SOCIETY)

MELVIN T. SMITH, DIRECTOR
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TELEPHONE 801/533-5755

James W. Smith, Jr.
Administrator
Mineral Resource Development
And Reclamation Program
Division of Oil, Gas & Mining
4241 State Office Building
Salt Lake City, Utah 841114

Attn: D. Wayne Hedberg

RE: Permit Application for Genwal Coal Company's Crandall Canyon Mine, Lease Tract #2, ACT/015/032, Folder No. 2, Emery County

In Reply Refer To Case No. H407

Dear Mr. Smith:

The Utah Preservation Office has received your letter of September 12, 1984, regarding the permit application for the Genwal Coal Company's Crandall Canyon Mine, Lease Tract #2.

After review of the documentation provided concerning cultural resources in the project area, our office would advise the Division of Oil, Gas & Mining that the approved Forest Service report would be adequate to include as evidence of a survey being completed of the project area, and that this report is complete and could be transmitted to the Office of Surface Mining.

Since no formal consultation request concerning eligibility, effect or mitigation as outlined by 36 CFR 800 was indicated by you, this letter represents a response for information concerning location of cultural resources. If you have any questions or concerns, please contact me at 533-7039.

Sincerely,

James L. Dykman
Cultural Resource Advisor
Office of State Historic
Preservation Officer

JLD:jrc:H407/0885V

UT0067

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
UTAH STATE OFFICE
324 SOUTH STATE, SUITE 301
SALT LAKE CITY, UTAH 84111-2303

IN REPLY REFER TO
3482
SL-062648
U-921

October 11, 1985

Betty-file

To: Richard Holbrook, OSM Senior Project Manager, State of Utah, Denver

Attn: Ron Naton

From: Chief, Solid Minerals and Mining Law

Subject: Genwal Coal Company, Crandall Canyon Mine, Emery County, Utah, Approved Mining Plan

The following subject information has been received in this office for review:

Two volumes forwarded with your letter dated September 12, 1985, and identified as "Mining and Reclamation Plan, Tract 2, Crandall Canyon Mine."

Pages forwarded with your letter dated September 20, 1985, and identified as "09/05/85 UT DOGM Transmittal of MRP amendment plans to increase coal production."

The above information has been reviewed for compliance with 43 CFR 3482.1(c), particularly the resource recovery and protection plan (R2P2) or underground mining part of the subject plan. We were also requested to note any conflicts with future recovery of coal resources.

The two-volume submittal appears to be a complete resubmittal of the volume identified as Lease Tract 2, reviewed in this office and commented on by our memorandum dated October 30, 1984.

The following are our comments on the new submittals listed above:

1. The two new Tract 2 volumes provide adequate information for the requirements of 43 CFR 3482.1(c) rules and regulations and to satisfy the concerns of our subject memorandum dated October 30, 1984.

2. The mining plan as submitted does not conflict with future recovery of coal resources.

3. Plate 3-2, "Mining Sequence by Future Permit." This print is not approved as submitted. At this time, the only coal lands that Genwal Company has a legal right to mine coal from are Tract 1 and Tract 2 as shown. All other lands shown will require that additional coal leases be issued. The emergency lease has been filed and is being considered.

4. Plate 3-1, "Crandall Canyon Mine Tract 2 Mining Plan Hiawatha Seam." Property barriers as shown are too large. These discrepancies can be adjusted and approved by BLM as mining progresses.

5. Plate XII-5, "Subsidence Limit." The angles of draw used on this drawing are larger than the angle of draw generally accepted for this coal field. Minable coal reserves, that are reduced because of an angle of draw involment, must have BLM participation and approval.

We have determined that the total plan submission, Tracts 1 and 2, are adequate for BLM administration of the associated Federal coal lease(SL-062648) and that maximum recovery can be achieved within the limits of the equipment and technology presented in the plan. We recommend approval of the underground mining part of the permit application for Tract 2 and the included parts of Tract 1 with reservations to negotiate, if necessary, barrier pillar sizes and angle of draw.

Jackson W. Moffitt