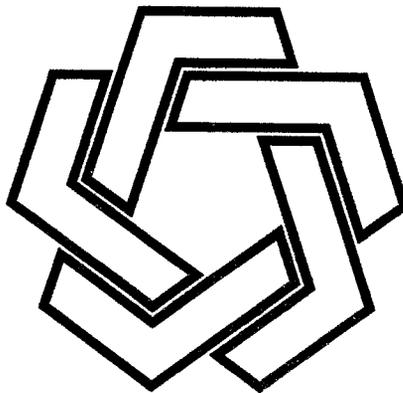


STATE DECISION PACKAGE

**Huntington #4 Mine
Beaver Creek Coal Company
Reclaimed**

FIVE-YEAR RENEWAL



**STATE OF UTAH
Department of Natural Resources
Division of Oil, Gas & Mining**

APRIL 29, 1990

**UTAH DIVISION OF OIL, GAS AND MINING
STATE DECISION DOCUMENT AND
TECHNICAL ANALYSIS
HUNTINGTON #4 MINE
ACT/015/004**

**Beaver Creek Coal Company
Emery County, Utah
April 30, 1990**

CONTENTS

- * Administrative Overview
- * Location Map
- * Permitting Chronology
- * Mine Plan Information Form
- * Findings
- * State Five-Year Renewal Permit
- * Technical Analysis
- * Cumulative Hydrologic Impact Assessment (CHIA)
- * Affidavits of Publication

AT115/2

ADMINISTRATIVE OVERVIEW

**Beaver Creek Coal Company
Huntington #4 Mine
ACT/015/004
Emery County, Utah**

April 30, 1990

Background

The Huntington Canyon No. 4 Mine, also known as the Huntington No. 4 Mine, is owned by Beaver Creek Coal Company (BCCC), a wholly owned subsidiary of the Atlantic Richfield Company of Los Angeles, California. The mine is located in Mill Fork Canyon, tributary to Huntington Creek, approximately 12 road miles northwest of Huntington, Emery County, Utah. The mine began production in early 1977 on areas disturbed by mining operations in the 1940's. The mine was temporarily inactive from October 1978 through March 1980. The mine was in full operation from March 1980 through November 1984, when the mine was permanently closed.

The reclamation of the Huntington No. 4 Mine was undertaken in 1985. Phase I bond release inspection was conducted in May 1986 and the Phase I bond release became effective November 10, 1986.

The applicant published notice for the five-year permit renewal for four consecutive weeks ending on March 13, 1990. No comments were received.

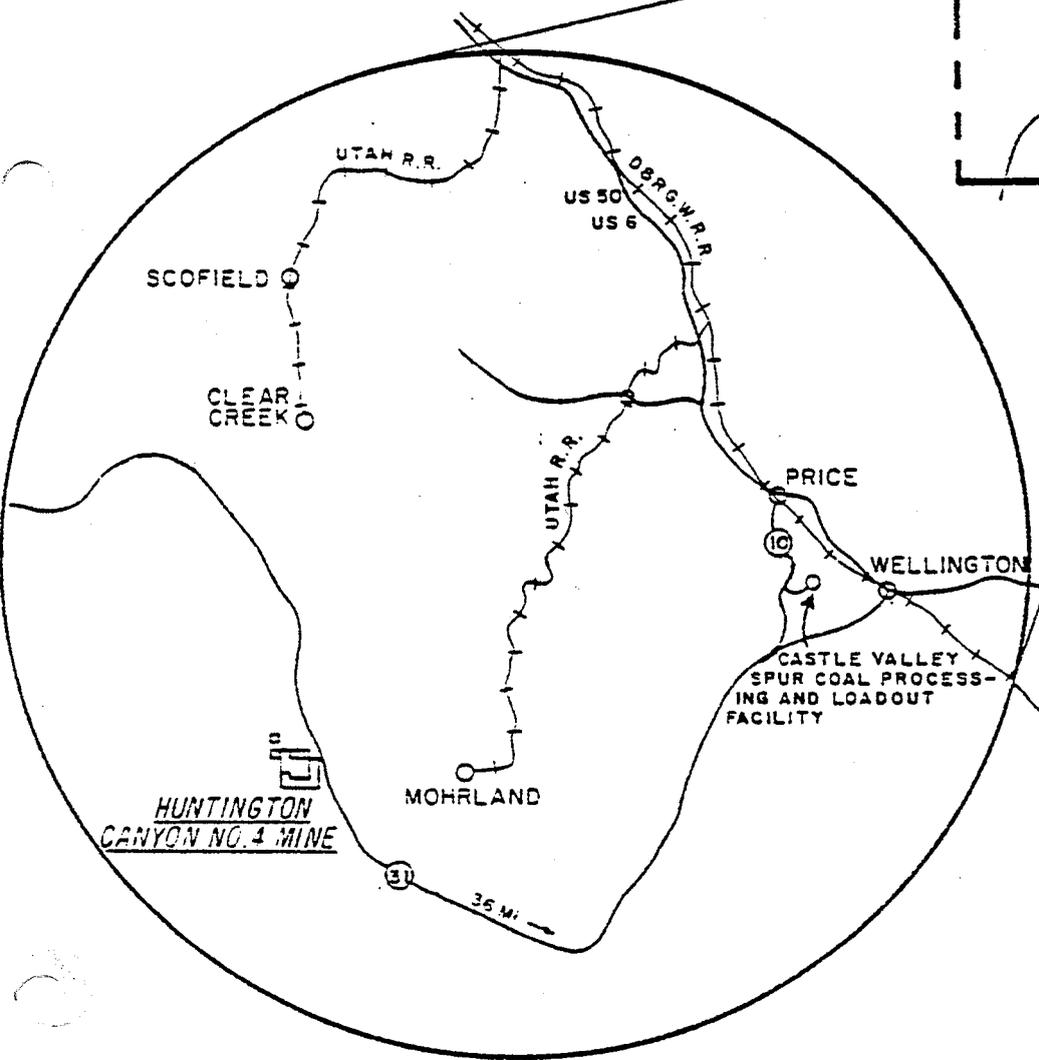
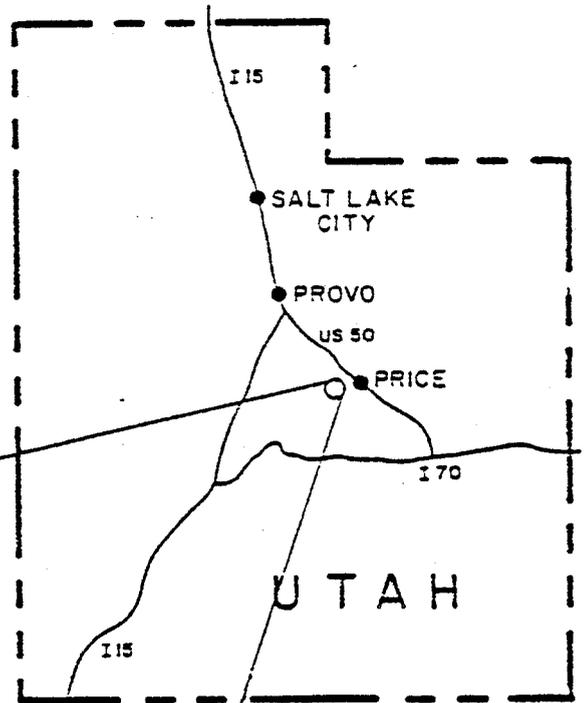
Recommendation for Approval

Approval for the five-year permit renewal is recommended, based on a review of the Permit Application Package updated through April 26, 1990, including all permit changes approved to date and conformance with the criteria for the approval of permit renewal applications under UMC 788.14-.16 (see attached Findings). The permit renewal term will not exceed the original permit term of five years and will expire on April 29, 1995.

AT115/14

BEAVER CREEK COAL COMPANY

AREA OF OPERATIONS



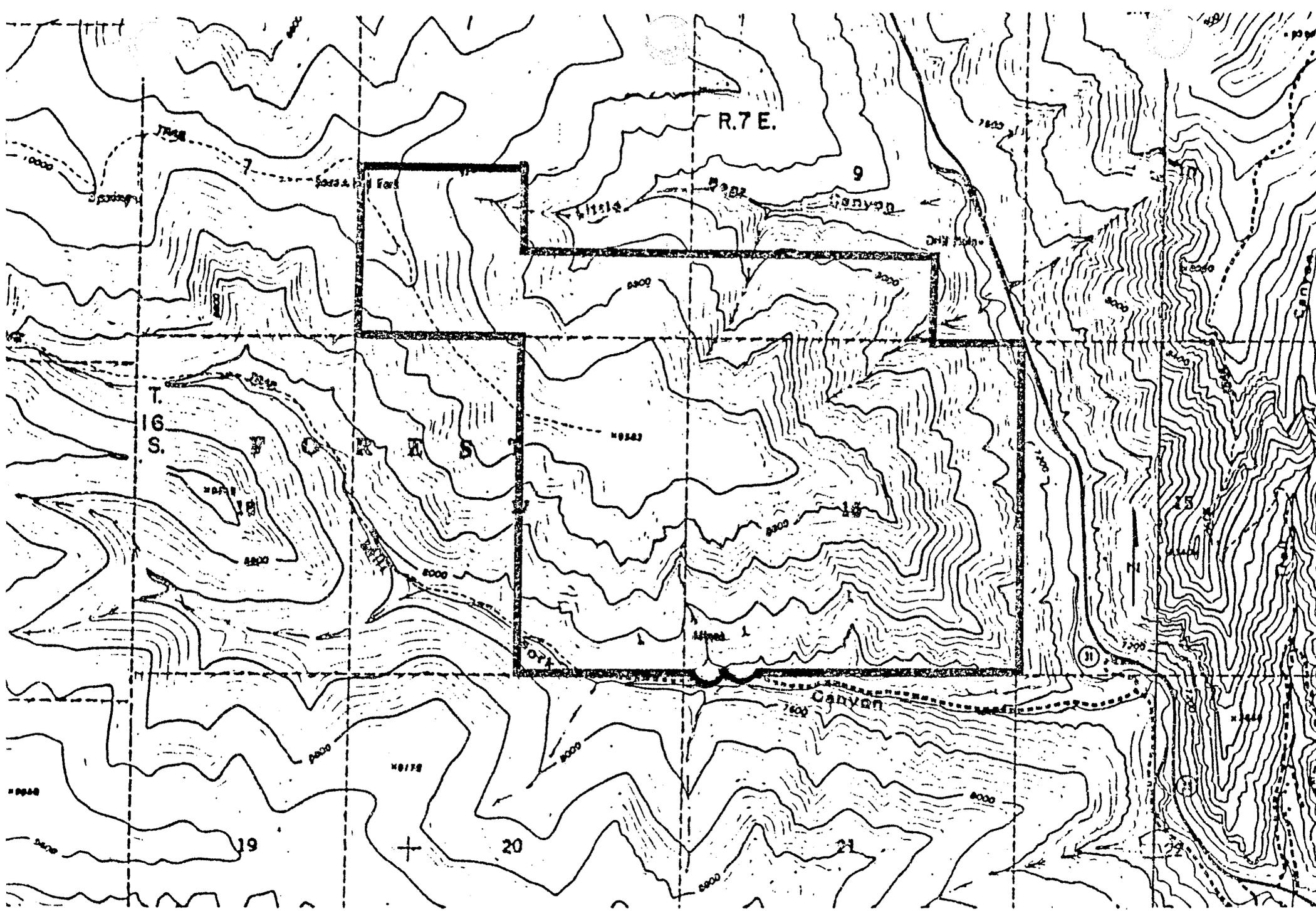


FIGURE 2. Huntington Canyon No. 4 Mine Permit Area

**CHRONOLOGY
BEAVER CREEK COAL COMPANY
ACT/015/004**

February 8, 1990	Beaver Creek Coal Company submits updated maps and text, initiating 5-year permit renewal process.
February 9, 1990	Division notifies state and federal agencies of permit renewal. Provides copies of updated text and maps.
February 12, 1990	Division issues Determination of Completeness.
February 20, 1990	BCCC initiates public notice for four consecutive weeks.
April 23, 1990	Division issues technical deficiency letter.
April 26, 1990	BCCC submits materials addressing technical deficiencies.
April 30, 1990	Public comment period concludes with no adverse comments received. Division makes necessary findings. Permit issued.

MINE PLAN INFORMATION

Mine Name Huntington #4 Mine State ID: ACT/015/004
 Operator Beaver Creek Coal Company County: Emery
 Controlled By Beaver Creek Coal Company
 Contact Person(s) Dan Guy Position: Manager,
Permitting & Compliance
 Telephone: (801) 637-5050
 New/Existing Reclaimed Mining Method Room and Pillar
 Federal Lease Nos. U-33454 and SL-064903 (relinquished 3/1/85)
 State Mineral Lease No. N/A
 Legal Descriptions _____

<u>Surface Resources</u> <u>(acres)</u>	<u>Existing</u> <u>Permit Area</u>	<u>Proposed</u> <u>Permit Area</u>	<u>Total Life</u> <u>of Mine Area</u>
Federal	-	--	600.00
State			
Private			720.00
Other			
TOTAL		--	1320.00

Coal Ownership (Acres)

Federal		600.00
State		
Private		720.00
Other		
TOTAL		1320.00

Page 2
 Mine Plan Information
 Huntington #4 Mine
 Beaver Creek Coal Co.
 April 29, 1990

	<u>Total Reserves</u>	<u>Total Recoverable Reserves</u>
<u>Coal Resource Data</u>		
Federal	Tons	3.12
State		
Private		0.78
Other		
TOTAL		3.9

Recoverable
Reserve Data

	<u>Name</u>	<u>Thickness</u>	<u>Depth</u>
Seam	<u>Blind Canyon</u>	<u>4'-13'</u>	<u>1,000-1,600</u>
Seam	<u>Hiawatha</u>	<u>4'-7'</u>	<u>1,100-1,700</u>
Seam			
Seam			
Seam			

Mine Life _____ Reclaimed _____
 Average Annual Production _____ Percent Recovery 45-50%
 Date Projected Annual Rate Reached 1983
 Date Production Begins 1977 Date Production Ends 1984
 Reserves Recoverable by: (1) Surface Mining _____
 (2) Underground Mining 3.9 x 10⁶ Tons
 Reserves Lost Through Management Decision _____
 Coal Market N/A

AT115/16-17
 3/22/90

FINDINGS

**Huntington #4 Mine
ACT/015/004
Beaver Creek Coal Company
Emery County, Utah**

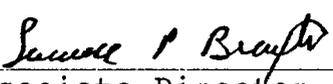
1. The plan and the permit application are accurate and complete and all requirements of the Surface Mining Control and Reclamation Act (the "Act"), and the approved Utah State Program have been complied with (UMC 786.19[a]).
2. The applicant has undertaken acceptable practices for the reclamation of disturbed lands (PAP Chapter 4). These practices have been shown to be effective in the short-term; there are no long-term reclamation records utilizing native species in the western United States. Nevertheless, the Division has determined that reclamation, as required by the Act, has been accomplished under the Permit Application Package (PAP) (UMC 786.19[b]) (see Technical Analysis [TA] Section UMC 817.111-.117).
3. The assessment of the probable cumulative impacts of all anticipated coal mining and reclamation activities in the general area on the hydrologic balance has been made by the Division. The Reclamation Plan under the application had been designed to prevent damage to the hydrologic balance in the permit area (UMC 786.19[c] and UCA 40-10-11[2][c]). (See Cumulative Hydrologic Impact Analysis [CHIA]).
4. The proposed lands included within the permit area are:
 - a. not included within an area designated unsuitable for underground coal mining operations;
 - b. not within an area under study for designated lands unsuitable for underground coal mining operations;
 - c. not on any lands 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] (cemeteries);
 - d. within 100 feet of a public road;
 - e. not within 300 feet of any occupied dwelling (UMC 786.19[d]).

5. The Division's issuance of a permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800) (UMC 786.19[e]).
6. The applicant has the legal right to enter and complete reclamation activities in the permit area (UMC 786.19[f]).
7. A 510[c] report has been run on the Applicant Violator System (AVS), which shows that: prior violations of applicable laws and regulations have been corrected; Beaver Creek Coal Company is not delinquent in payment of fees for the Abandoned Mine Reclamation Fund; and 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[g], [h], [i]; (OSMRE Relatedness Report, reverified April 26, 1990)).
8. Reclamation operations performed under the permit are consistent with other operations anticipated to be performed in areas adjacent to the proposed permit area (UMC 786.19[j]).
9. The original bond was posted by the operator on April 15, 1985 in the amount of \$360,102.00. Phase I bond release was approved November 10, 1986 and the bond was ridered December 31, 1986 with a current bond in the amount of \$144,041.60.
10. The applicant has satisfied the requirements for alluvial valley floors and prime farmlands (UMC 786.19[l]). (See TA Section UMC 785.19 and 828.00).
11. The proposed postmining land use of the permit area has been approved by the Division (UMC 786.19[m]). (See TA Section UMC 817.133).
12. The Division has made all specific approvals required by the Act, the Cooperative Agreement and the Federal Lands Program (UMC 786.19[n]).
13. The proposed operation will not affect the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats (UMC 786.19[o]). (See TA UMC 817.97.)

- 14. All procedures for public participation required by the Act, and the approved Utah State Program have been complied with (UMC 786.11-.15).
- 15. The applicant has removed all existing structures (see TA Section UMC 817.181).



Permit Supervisor



Associate Director, Mining



Director

mine file

RECEIVED
MAY 29 1990

DIVISION OF
OIL, GAS & MINING
April 30, 1990

FEDERAL

Permit Number ACT/015/004

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
(801) 538-5340

This permit (five-year renewal), ACT/015/004, is issued for the state of Utah by the Utah Division of Oil, Gas and Mining (DOGM) to:

Beaver Creek Coal Company
P. O. Box 1378
Price, Utah 84501
(801) 637-5050

for the Huntington #4 Mine. A performance bond is filed with the DOGM in the amount of \$144,041.00, payable to the state of Utah, Division of Oil, Gas and Mining, and the Office of Surface Mining, Reclamation and Enforcement (OSMRE). DOGM must receive a copy of this permit signed and dated by the permittee.

- Sec. 1 **STATUTES AND REGULATIONS** - This permit is issued pursuant to the Utah Coal Mining and Reclamation Act of 1979, Utah Code Annotated (UCA) 40-10-1 et seq, hereafter referred to as the Act.
- Sec. 2 **PERMIT AREA** - The permittee is authorized to conduct reclamation activities on the following described lands (as shown on the map appended as Attachment A) within the permit area at the Huntington #4 Mine, situated in the state of Utah, Emery County, and located:

This legal description is for the permit area (as shown on Attachment B) of the Huntington #4 Mine. The permittee is authorized to conduct underground coal mining activities connected with mining on the foregoing described property subject to the conditions of the leases, the approved mining plan, including all conditions and all other applicable conditions, laws and regulations.

- Sec. 3 PERMIT TERM** - This revised permit becomes effective on April 30, 1990, and expires on April 30, 1995.
- Sec. 4 ASSIGNMENT OF PERMIT RIGHTS** - The permit rights may not be transferred, assigned, or sold without the approval of the Director, DOGM. Transfer, assignment, or sale of permit rights must be done in accordance with applicable regulations, including but not limited to 30 CFR 740.13[e] and UMC 788.17-.19.
- Sec. 5 RIGHT OF ENTRY** - The permittee shall allow the authorized representative of the DOGM, including but not limited to inspectors, and representatives of OSMRE, without advance notice or a search warrant, upon presentation of appropriate credentials, and without delay to:
- A. have the rights of entry provided for in 30 CFR 840.12, UMC 840.12, 30 CFR 842.13 and UMC 842.13; and
 - B. be accompanied by private persons for the purpose of conducting an inspection in accordance with UMC 842.12 and 30 CFR 842, when the inspection is in response to an alleged violation reported by the private person.
- Sec. 6 SCOPE OF OPERATIONS** - The permittee shall conduct reclamation activities only on those lands specifically designated as within the permit area on the maps submitted in the reclamation plan and permit application and approved for the term of the permit and which are subject to the performance bond.
- Sec. 7 ENVIRONMENTAL IMPACTS** - The permittee shall minimize any adverse impact to the environment or public health and safety through but not limited to:
- A. accelerated monitoring to determine the nature and extent of noncompliance and the results of the noncompliance;

- B. immediate implementation of measures necessary to comply; and
- C. warning, as soon as possible after learning of solids, sludge, filter backwash or pollutants in the course of treatment or control of waters or emissions to the air in the manner required by the approved Utah State Program and the Federal Lands Program which prevents violation of any applicable state or federal law.

Sec. 9 CONDUCT OF OPERATIONS - The permittee shall conduct its operations:

- A. in accordance with the terms of the permit to prevent significant, imminent environmental harm to the health and safety of the public; and
- B. utilizing methods specified as conditions of the permit by DOGM in approving alternative methods of compliance with the performance standards of the Act, the approved Utah State Program and the Federal Lands Program.

Sec. 10 AUTHORIZED AGENT - The permittee shall provide the names, addresses and telephone numbers of persons responsible for operations under the permit to whom notices and orders are to be delivered.

Sec. 11 COMPLIANCE WITH OTHER LAWS - The permittee shall comply with the provisions of the Water Pollution Control Act (33 USC 1151 et seq), and the Clean Air Act (42 USC 7401 et seq), UCA 26-11-1 et seq, and UCA 26-13-1 et seq.

Sec. 12 PERMIT RENEWAL - Upon expiration, this permit may be renewed for areas within the boundaries of the existing permit in accordance with the Act, the approved Utah State Program and the Federal Lands Program.

Sec. 13 CULTURAL RESOURCES - If during the course of mining operations, previously unidentified cultural resources are discovered, the permittee shall ensure that the site(s) is not disturbed, and shall notify DOGM. DOGM, after coordination with OSMRE, shall inform the permittee of necessary actions required. The permittee shall implement the mitigation measures required by DOGM within the time frame specified by DOGM.

Sec. 14 APPEALS - The permittee shall have the right to appeal as provided for under UMC 787.

Sec. 15 SPECIAL CONDITIONS - There are no special conditions associated with this permitting action.

The above conditions (Secs. 1-15) are also imposed upon the permittee's agents and employees. The failure or refusal of any of these persons to comply with these conditions shall be deemed a failure of the permittee to comply with the terms of this permit and the lease. The permittee shall require his agents, contractors and subcontractors involved in activities concerning this permit to include these conditions in the contracts between and among them. These conditions may be revised or amended, in writing, by the mutual consent of DOGM and the permittee at any time to adjust to changed conditions or to correct an oversight. DOGM may amend these conditions at any time without the consent of the permittee in order to make them consistent with any new federal or state statutes and any new regulations.

THE STATE OF UTAH

By:

Date:

Diann K. Nelson

4-30-90

I certify that I have read, understand, and accept the requirements of this permit and any special conditions attached.

Richard J. The
Authorized Representative of
the Permittee

Date:

5-24-90

APPROVED AS TO FORM:

By:

Raymond H. Fairley, Sr.
Assistant Attorney General

Date:

**TECHNICAL ANALYSIS*
HUNTINGTON #4 MINE
INA/015/004**

**Beaver Creek Coal Company
Emery County, Utah
April 30, 1990**

UMC 817.97 Protection of Fish, Wildlife and Related Values-(SMW)

Existing Environment and Applicant's Proposal

A survey for the presence of canyon sweetvetch was conducted on areas which surround the disturbance by the U.S. Forest Service (USFS) and a Beaver Creek Coal Company (BCCC) consultant (1987 Annual Report). No find was reported (Stipulation 817.111-.117-[3]).

The disturbed areas at Huntington #4 Mine were reclaimed and reseeded in the fall of 1985. Vegetative monitoring in 1987 and 1988 reports "there is considerable evidence of heavy utilization (of the area and vegetation) by both elk and deer" (Annual Report 1988).

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.100 Contemporaneous Reclamation-(SMW)

Existing Environment and Applicant's Proposal

The area was seeded as the recontouring was completed (1987 Annual Report).

Compliance

The applicant is in compliance with this section.

Stipulations

None.

*NOTE: The Huntington No. 4 Mine has been reclaimed and received Phase I bond release. This condensed Technical Analysis addresses vegetation issues.

UMC 817.111 Revegetation: General Requirements-(SMW)

Existing Environment and Applicant's Proposal

All 37.5 acres of disturbance at the Huntington #4 Mine site were reseeded in the fall of 1985. The approved seed mix was applied as soon as topsoil was spread. A hydroseeder was used to distribute the seed, wood fiber mulch and Terra Tac AR at the rate of 500 and 40 lbs. per acre, respectively. The site was then mulched with 2,000 lbs. per acre wood fiber and 60 lbs. per acre Terra Tac AR. A 16-16-8 fertilizer was applied with the mulch at the rate of 100 lbs. per acre. Containerized Mountain Mahogany and Bitterbrush seedlings (Stipulation 817.111-.117[2]) were transplanted during the fall of 1985 at the rate of 300 per acre (1987 Annual Report). In addition, 100 Ponderosa Pine transplants were planted at the site. The riparian area was seeded in the same manner with the approved riparian seed mix. The applicant included two forb species (Volume 2, Appendix 8) in the riparian seed mix (Stipulation 817.111-.117[1]).

In November 1988, several small areas, the total less than two acres in size, of low growth, no growth, or regraded areas were reseeded using the approved seed mix. The areas were broadcast seeded and raked to cover the seed. Fertilizer (50-30-100) was applied at the rate of 100 lbs. per acre and one ton per acre straw mulch was then placed on the newly seeded areas (1988 Annual Report).

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.112 Revegetation: Use of Introduced Species-(SMW)

Existing Environment and Applicant's Proposal

The applicant used two introduced species in seeding the disturbed areas. One introduced species was seeded in the riparian area. These species were approved by the DOGM (Permit Application Approval Package, Huntington Canyon No. 4 Mine, Beaver Creek Coal Company, Emery County, Utah, page 34).

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.113 Revegetation: Timing-(SMW)

Existing Environment and Applicant's Proposal

All disturbed areas were seeded as the recontouring was completed. Seeding was done in the fall of 1985 (1987 Annual Report). Areas of low growth, no growth, or regraded were reseeded in the fall of 1988.

Compliance

Fall is the normal accepted season in which to seed, with no irrigation in this region.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.114 Revegetation: Mulching and Other Soil Stabilizing Practices-(SMW)

Existing Environment and Applicant's Proposal

All areas seeded in 1985 were mulched with one ton per acre wood fiber mulch to control erosion and enhance soil moisture retention. Terra Tac AR was added to the wood fiber mulch to chemically anchor the mulch to the soil surface. Straw was used as mulch at the rate of one ton per acre in the 1988 repair work.

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.117 Revegetation: Tree and Shrub Stocking for Forest Land-(SWM)

Existing Environment and Applicant's Proposal

Mountain Mahogany and Bitterbrush seedlings were planted in the fall of 1985 at the rate of 300 per acre. In addition, six shrub species were seeded on the reclaimed area and four shrub species in the riparian area.

Compliance

The applicant is in compliance with this section.

Stipulations

None.

TECHNICAL ANALYSIS

Beaver Creek Coal Company
Huntington #4 Mine
ACT/015/004, Emery County, Utah

March 14, 1985

Introduction

The Huntington Canyon #4 Mine, also called the Huntington #4 Mine, is owned and operated by Beaver Creek Coal Company, a wholly owned subsidiary of the Atlantic Richfield Company of Los Angeles, California. The operation is located in Mill Fork Canyon, tributary to Huntington Creek, approximately 12 road miles northwest of Huntington, Utah. The mine began production in early 1977 on areas disturbed by mining operations conducted during the 1940's. The mine started production in early 1977, was temporarily inactive in October 1978 and resumed full-time operation in March 1980. The mine was permanently closed November 1, 1984, when maximum coal recovery was achieved.

An application for a mining permit was received by the regulatory authority on March 20, 1981. An Apparent Completeness Review (ACR) was prepared and sent to the applicant on June 9, 1982. Beaver Creek Coal Company submitted their response to the ACR on June 20, 1983. The regulatory authority prepared a Determination of Completeness and Technical Deficiency Document (DOC/TD) which was sent to the applicant on August 1, 1983. Beaver Creek Coal Company responded to the latter on November 2, 1983, and the regulatory authority determined the Mining and Reclamation Plan (MRP) complete on December 20, 1983.

Existing surface facilities and roads encompass 12.5 acres of disturbance. Surface disturbance is located on a steep slope of primarily southerly exposure. Beaver Creek Coal Company intends to perform reclamation upon the 12.5 acres of disturbed lands used in the operation of the Huntington #4 Mine.

The Huntington #4 Mine is located in the upper Blind Canyon seam, approximately 80 to 100 feet above the lower Hiawatha seam. All mining was performed using the room-and-pillar method.

Surface ownership is 46 percent Federal and 54 percent fee. Mineral leases (coal ownership) are also 46 percent Federal and 54 percent fee. Total acreage is 1,320 acres. The Huntington #4 Mine, at full operation, employed about 53 people.

Description of Existing Environment

The Huntington #4 Mine is located in Mill Fork Canyon, a tributary to lower Huntington Canyon Creek. This portion of the Huntington Canyon

watershed is characterized by steep, relatively narrow canyons which typically dissect the eastern edge of the Wasatch Plateau. Huntington Creek is a tributary to the Colorado River via the San Rafael and Green Rivers.

Vegetation in the vicinity of the mine consists primarily of pinyon-juniper associations on south-facing exposures and mixed conifer stands on northerly exposures, comprised of Douglas fir, spruce and white fir. Riparian areas occur along stream channels in canyon bottoms and locally in association with springs and seeps. At upper elevations of the Wasatch Plateau, predominant vegetation consists of aspen and Douglas fir forests interspersed among areas dominated by montane big sagebrush.

Economically and aesthetically important wildlife inhabiting the environs of the mine are mule deer, elk, cougar, black bear, coyote, snowshoe hare, golden eagle and a variety of raptors, gamebirds and songbirds. Huntington Creek is classified by the State as a Class III fishery, providing habitat for salmonid species, primarily brown and rainbow trout.

Predominant land-uses in the general area of the minesite are wildlife habitat, limited grazing land and recreation. From an industrial aspect, the historic use of the land has been and continues to be coal mining.

Streamflow in the Huntington Canyon watershed result primarily from snowmelt which constitutes about 65 percent of the annual discharge (Danielson et al., 1981). The snowmelt season typically occurs from April through July.

Mill Fork Canyon is oriented in primarily an east-west direction, with Mill Fork Creek flowing easterly into Huntington Creek. The stream in Mill Fork Canyon is intermittent; it was dry during the summer of 1977, but flowed at the mouth of Mill Fork Creek during the summers of 1978 and 1979, both years of above-normal precipitation (Danielson et al. 1981). The canyon is approximately paralleled on the north by Little Bear and Crandall Canyons and on the south by Rilda Canyon. The mine facilities are located at an elevation of approximately 7,400 to 7,800 feet and are on the south facing slope of the canyon.

The ground water system in the area of the Huntington #4 Mine is characterized by localized aquifers in the Castlegate Sandstone, apparent perched aquifer conditions in the upper Blackhawk Formation and a regional aquifer occurring in the underlying Star Point Sandstone and lower portion of the Blackhawk Formation. Danielson, et al. (1981), recognized the regional aquifer system and formally termed it the Star Point-Blackhawk aquifer (page 22). The varied distribution of faults and

fractures, impermeable shale beds and paleochannels contributes to a complex pattern of ground water flow within and adjacent to the permit area.

Ground water recharge appears to be largely associated with snowmelt rather than rainfall, based on deuterium studies performed by the U. S. Geological Survey (USGS) and Beaver Creek Coal Company. Recharge of the Star Point-Blackhawk aquifer is thought to primarily occur through a conduit system of faults and fractures. Zones of fracturing and faulting would allow water to pass through less permeable beds that normally would impede vertical flow (Danielson, et al. 1981).

Ground water discharge occurs at springs and seeps, a few of which occur near the Huntington #4 Mine lease area. In addition, base flow for perennial drainages is thought to be sustained by recharge from the Star Point-Blackhawk aquifer.

Reference

Danielson, T. W., ReMillond, M. D., and Fuller, R. H. 1981. Hydrology of the coal resource areas in the upper drainages of Huntington and Cottonwood Creeks, central Utah: U. S. Geological Survey Open File Report, 81-539, page 85.

UMC 785.19 Alluvial Valley Floors

Existing Environment and Applicant's Proposal

Mill Fork Canyon lacks unconsolidated streamlaid deposits, current or historical flood irrigation or subirrigation and the capability to be flood irrigated. The applicant indicates no alluvial valley floors exist within and adjacent to the permit area (MRP, page 7-95).

Compliance

The applicant has provided sufficient information about alluvial deposits and irrigation (MRP, Section 7.3, pages 7-94 and 7-95, and Plate 6-1) for the Division to determine as required by UMC 785.19(c)(2) that no alluvial valley floors exist.

Stipulations

None.

UMC 817.11 Signs and Markers

Existing Environment and Applicant's Proposal

The applicant has placed identification signs at the entrance to the mine area. Perimeter markers have been placed around the perimeter of the disturbed area and buffer zone signs have been placed along Mill Fork Creek to prevent disturbance to this perennial drainage (MRP, Section 3.3.5.1). The one existing topsoil stockpile has been adequately marked. No explosives are used incident to surface activities (MRP Section 3.3.5.4).

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.13-.15 Casing and Sealing of Underground Openings

Existing Environment and Applicant's Proposal

All exploration holes within the permit and adjacent area have been identified as to location, elevation at the collar and extent of casing. All boreholes designated by the code MC and HCD (MRP, Table 2, page 6-3) have been either cemented entirely or cased and plugged with cement at the surface. Thirteen exploration boreholes designated DH were drilled during 1974-1976. Completion records for DH boreholes were not maintained (MRP, page 6-14). The applicant attempted to locate and inspect DH boreholes during 1981 and states that boreholes associated with identifiable drill sites were covered or naturally plugged (MRP, page 6-14).

The first phase of the reclamation activity following final abandonment of the operation will be to permanently seal mine portals. The final sealing of mine portals will be accomplished by installing a recessed concrete block seal 20 to 50 feet from the mouth of the portal (MRP, page 3-56). Seals will be constructed of a double solid concrete block wall with a pilaster in the center. The seal will be recessed a minimum of six inches into the floor, roof and ribs and shall be coated with mortar on one side. Pipes or vents will not be placed within the seal since the portal will be backfilled and pipes can deteriorate over long periods of time, allowing air to enter the mine and increasing the possibility of combustion. Since a portion of the mine slopes slightly towards the portals, seal design will accommodate mine inflows and a maximum hydrologic pressure of 30 psi. The area from the seal to the

mouth of the portal will be backfilled to minimize roof breakage. Portal structures will be removed and the exposed coal seam, including the former portal opening, will be covered during reclamation of the upper pad and highwall areas (Figure 3-6, MRP, page 3-57).

Compliance

MC and HCD boreholes have been adequately plugged with cement. Although the Division prefers cement to natural plugs, the applicant's inability to locate DH boreholes excludes initiating remedial procedures to excavate and install cement plugs. With regard to the above, the Division grants approval for the method of DH boreholes abandonment.

The applicant's methodology for permanently sealing mine portals adequately address the regulations. BLM has also reviewed the applicant's proposed methodology and inspected the site to assure the feasibility of implementation.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.21-.25 Topsoil

Existing Environment and Applicant's Proposal

Huntington #4 minesite is located at an elevation of between 7,400 and 7,800 feet on a southern exposure. The annual precipitation ranges from 12 to 20 inches and the frost free days range from 60 to 120. Mean annual temperature is 38° to 45° F.

Soil Resource Information is discussed in Volume 2, Section 8.3 of the MRP.

Soils in the area have evolved from the weathering of sandstone and shale on slopes ranging from nearly level to as steep as 90 percent. Three soil series were found to exist in the area; Patmos, Quigley and Podo. The Patmos and Podo series are Ustorthents and the Quigley is a Haploboroll. The A horizons range from as thin as two inches in the Podo to as thick as seven inches in the Quigley. Soil permeability is moderate to moderately rapid and the erosion hazard due to water is slight to high. The native vegetation is Salina wildrye, juniper, big sagebrush, rabbitbrush and pine.

Approximately 12.5 acres of land have been disturbed, the majority of which occurred prior to the enactment of Public Law 95-87. Therefore, except in the area of the sediment pond, no topsoil was removed and placed in storage for final reclamation. To alleviate the topsoil shortage the applicant has proposed to use the soil material that was sidecast during the construction of the mine, as a plant growth medium for final reclamation. Samples of the sidecast soil material were taken and chemical and physical analyses conducted. Based on these results (Table 8-4 of the MRP), the soil material was found to be suitable as a plant growth medium. In the area of the pumphouse and holding pond, the soil that is in place at the present time will be used for reclamation. No soil samples of this soil material have been taken at this time. During reclamation, the topsoil substitute will be retrieved by a backhoe and placed on the road and pad areas. A dozer (D-7 or equivalent) will be used to spread the soil material. The topsoil removed and saved during the construction of the sediment pond will be placed back on the sediment pond after it has been removed and graded. The area used for the pumphouse will be regraded and the in-situ soil material used for reclamation. After redistribution of the soil material, it will be deeply scarified to reduce compaction and additional soil samples will be taken to evaluate the need for N, P, K in preparation for reseeding, as per the revegetation plan (Section 3.5.4 of the MRP).

Compliance

The applicant is not in compliance at this time. Analysis of the soil material to be used for reclamation of the pumphouse and holding pond must be submitted before the applicant will meet the requirements of this section.

Stipulation 817.21-.25-(1)-EH

1. Soil analysis demonstrating the suitability of the soil material proposed for use in reclamation of the pumphouse must be submitted to the regulatory authority for approval no later than June 1, 1985.

UMC 817.41 Hydrologic Balance: General Requirements

Existing Environment and Applicant's Proposal

Volume 2, pages 7-1 through 7-96, of the MRP contains the hydrologic information for the permit and surrounding areas.

Surface Waters. The applicant proposes to route disturbed area runoff into sedimentation ponds via a series of structures including ditches and culverts. The sedimentation pond system includes two ponds in series with the lower pond having a gravel dike for filtering pond

effluent. The effectiveness of the ponds is assessed by a sampling program which monitors effluent from the lower pond (MRP, Sections 3.4.3 and 7.2.3.1).

Undisturbed drainage is routed around the minesite by a series of ditches and culverts to prevent mixing of undisturbed and disturbed drainage (MRP, page 3-7a).

Ground Water. The applicant has mined the Blind Canyon seam, the upper seam, and developed rock tunnels into the Hiawatha seam, the lower seam, which directly overlies the Star Point Sandstone. Only perched water zones have been noted in the Blackhawk Formation (page 7-5, MRP).

The Star Point Sandstone and lower portion of the Blackhawk Formation form an important regional aquifer. Major sandstone units within this package of sediments are water-bearing and are separated by less permeable strata. Recharge to the Star Point-Blackhawk aquifer is thought to occur primarily through conduits in the form of faults and fractures. Significant faulting in the permit area may be the local source of recharge to the Star Point-Blackhawk aquifer as well as the source of recharge to the paleochannel sands in the Blackhawk Formation (Plate 6-1, MRP).

Little Bear Spring, an important municipal water supply for the city of Huntington, lies immediately north of the lease area. This spring issues from the Panther Sandstone Member, stratigraphically the lowest of the three Star Point Sandstone members, at about 350 feet below the Hiawatha seam. The applicant terminated mining activities prior to penetrating fault zones which may be the primary conduit supplying water to the spring.

Compliance

The applicant withdrew plans to mine into the fault zone. With the cessation of mining in the Huntington No. 4 Mine, there should be no impacts to Little Bear Spring.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.42 Hydrologic Balance: Water Quality Standards and Effluent Limitations

Existing Environment and Applicant's Proposal

The discussion of Water Quality Standards and Effluent Limitations can be found in Volume 2, Section 7 (pages 7-1 through 7-96) of the MRP. Other references addressed in this discussion are from Volume 1, Section 3 (pages 3-30, 3-58) of the MRP.

The applicant proposes to meet water quality effluent standards by routing all surface drainage from the disturbed area into a series of two sedimentation ponds. Mine water discharges are also routed into the sedimentation ponds (MRP, Section 3.4.3). The technical adequacy of the sediment pond system is discussed in Section UMC 817.46.

A NPDES permit has been obtained by the applicant for two discharge points at the minesite. Outfall 001 pertains to discharges from the cyclone overflow used as an intake for the water supply system for the mine. Outfall 002 pertains to the discharges from the lower sedimentation ponds (MRP, Section 3.4.3).

The applicant notes on page 3-58 of the MRP that the ponds will be the last structures removed at the minesite. Removal of the ponds will take place after revegetation of all other disturbed areas has been accomplished.

On page 3-30 of the MRP, the applicant notes that, pursuant to the on-going water quality monitoring program, should changes in water quality occur, the source of the problem will be identified and measures taken to correct any deficiencies.

Compliance

The measures proposed by the applicant are adequate based on the best technology currently available. The on-going water monitoring program will assess the effectiveness of the sediment control provided by the sedimentation ponds.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.43 Hydrologic Balance: Diversions and Conveyance of Overland Flow, Shallow Ground Water Flow and Ephemeral Streams

Existing Environment and Applicant's Proposal

The discussion of Diversions and Conveyance of Overland Flow, Shallow Ground Water Flow and Ephemeral Streams can be found in Volume 2, Section 7 (pages 7-1 through 7-96) of the MRP.

Diversion structures are located at the base of the highwall at the portal area. There are two separate structures, each diverting natural runoff to either side of the drainage in which the disturbed area is located. The diversions are temporary. They have been constructed by digging a trench along the base of the highwall and depositing the material in a compacted berm to the outside of the ditch (MRP, Section 702.3.1, page 7-78).

Approximately one half of the total discharge is intercepted and diverted by each of the diversion channels, and therefore, each channel must be capable of handling 4.2 cfs. To be conservative, a peak discharge of 5.0 cfs per channel was used in this analysis. The actual channels are not perfectly symmetrical; the highwall side is about 1:1 (H:V) and the berm side is about 2:1. For computation purposes, an average side slope of 1.5:1 was assumed. The channel bottom width is about 1.0 foot and the channel depth is about 1.5 feet and these values were, therefore, used in the analysis. The average slope of diversion A is 2.7 percent and that of diversion B is 1.7 percent. The channels are riprapped and the roughness coefficient was assumed to be 0.035 (MRP, page 7-80).

Energy dissipators are located at all discharge points from the diversion ditches and sedimentation ponds. In addition, energy dissipators are placed in the diversions at intervals of not less than 200 feet. These are in the form of small rock dikes or straw bales for sediment and erosion control. The discharges from the diversion ditches are onto a protective surface (i.e., conveyor belting or equivalent), and then into an area of rocks (or riprap) to dissipate the energy prior to allowing the drainage to run naturally. At the sedimentation ponds, overflows and channels are lined with riprap (see typical) to the point of final discharge into the ditch above the road (MRP, page 7-81).

Final reclamation includes removal of the diversion ditches by grading of the berm back into the trench. The entire yard will be reclaimed to the extent feasible and revegetated. Natural drainage will be restored to the extent practical.

Culverts. Drainage within the permit area is directed by diversions, open ditches and culverts. Undisturbed drainage areas are routed around the minesite by temporary diversions. Disturbed area drainage is directed to the sedimentation ponds by various culverts and ditches. These design characteristics and peak discharges are presented in Tables 7-16 and 7-19 on pages 7-68 and 7-83a of the Permit Application.

Reclamation of the disturbed area ditches is discussed on pages 3-62a and 3-63 of the MRP. Sediment control measures will consist of straw bale dikes placed at the lower edge of the reclaimed pad areas. All drainage from disturbed and reclaimed areas will still go into the sedimentation ponds until revegetation is established.

Compliance

The applicant has presented a feasible plan for diverting surface overland flow away from disturbed areas into Mill Fork Creek. The applicant also has presented calculations for certain diversion ditches and culverts within the disturbed area.

Based on the Sedimot model used by the regulatory authority, all diversion ditches and culverts prior to the March 16, 1984 submittal were deemed adequate to handle the peak flows from the 10-year, 24-hour peak flow. Following the March 16, 1984 submission, the applicant has recalculated peak flows for all the disturbed areas using a new rainfall value of 2.3 inches for the 10-year, 24-hour storm including disturbed area drainage shown on the sketch of Surface Disturbed Area Drainage (Figure 7-7).

The diversion ditch located between the outlet for the 36 inch culvert east of the fuel tank (Plate 3-1) and the sediment pond has several straw bale dikes in place. Maintenance of this portion of the diversion ditch is crucial to allow the function of these sediment controls.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.44 Hydrologic Balance: Stream Channel Diversions

Existing Environment and Applicant's Proposal

Specifics of stream channel diversions in the mine plan area can be found in Section 7.2.3.1 of the MRP and the diversion of Mill Fork Creek which can be found in Appendix 8 of Volume II of the MRP.

The following discussion encompasses the applicant's attempt to address the requirements of UMC 817.44(c) and (d)(1)(2)(3) in the MRP. There are two areas involving reclamation of diversions. One is the main yard and portal areas and the other is Mill Fork Creek pumphouse and diversion. Reclamation of the main yard and portal will take place during final reclamation. This will be accomplished by grading the berm

back into the trench. The entire yard will be reclaimed to the extent feasible and planted. Natural drainage will be restored to the extent feasible and planted. The natural drainage through the main mine yard will be restored based on the following study found on page 3-58 of the MRP. "In the spring of 1985, when the area is accessible, cross-sections will be taken above and below the proposed restored drainage, and in a comparable, adjacent drainage. If these cross-sections indicate the proposed restored drainage is not adequate, the design will be adjusted to a size compatible with these drainages." The current proposed restored drainage is discussed on page 3-58A and 3-58B of MRP, but will be potentially altered based on the outcome of the study mentioned above.

Compliance

The applicant has agreed to implement a study to determine what an acceptable reclaimed channel will be for the disturbed ephemeral drainage which flows through the mine yard and portal areas. The applicant has agreed to implement this study based on the fact that the requirements of UMC 817.44(b)(2) dictate that the capacity of the channel itself should be at least equal to the capacity of the unmodified stream channel immediately upstream and downstream of the diversion.

The Mill Fork Creek diversion will be reclaimed in a fashion most environmentally suitable to achieve the minimum amount of disturbance to Mill Fork Creek. This will be achieved by leaving the concrete retaining wall in place and providing an upstream and downstream rock face to blend the structure into the environment, stabilize stream banks and minimize sediment loading.

The applicant will be in compliance with this section when the following stipulation is met.

Stipulation 817.44-(1)-TM

1. The applicant has proposed on page 3-58 of the MRP that, "In the spring of 1985, when the area is accessible, cross-sections will be taken above and below the proposed restored drainage, and in a comparable, adjacent drainage. If these cross-sections indicate the proposed restored drainage is not adequate, the design will be adjusted to a size compatible with this drainage."

The regulatory authority is willing to waive the requirements of UMC 817.44(B)(2) if the applicant can adequately demonstrate to the regulatory authority that these cross-sections represent a conclusive demonstration of comparable, adjacent drainage. The following parameters will have to be demonstrated in order to assess the comparability of the two watershed systems.

1. Similar drainage area and channel capacity.
2. Similar slopes and aspects.
3. Cross-sections must be located in an area which gives comparable channel configurations.
4. Natural armoring or riprap size must be noted, as well as natural energy dissipators (i.e., large boulders, log jams, drops and eddies, etc.) so they can be engineered into the new designs.

These requirements must be met during the site visit in the spring of 1985 and the applicant must submit within 30 days of this site visit adequate plans for the proposed stream channel reclamation plans. These plans must include the following engineering designs at a minimum:

1. Energy dissipators within the channel at crucial points, namely where flows come onto the upper pad and drop off the cliff area below the upper pad onto the lower pad.
2. A design flow and channel configuration criteria compatible with this stipulation and 817.44(d)(1) (2)(3).

UMC 817.45 Hydrologic Balance: Sediment Control Measures

Existing Environment and Applicant's Proposal

The discussion of Sediment Control Measures can be found in Volume 2, Section 7 (pages 7-1 through 7-96) of the MRP.

Energy dissipators are located at all discharge points from diversion ditches and sedimentation ponds. In addition, energy dissipators are located in the diversions at intervals of not less than 200 feet and include small rock dikes or straw bales for sediment and erosion control. Discharge from the diversion ditches is directed onto a protective surface (i.e., conveyor belting or equivalent) and then into an area of rocks (or riprap) to dissipate the energy prior to allowing the drainage to run naturally. Overflows and channels leading to and from the sedimentation ponds are lined with riprap to the point of final discharge into the ditch above the road (MRP, Section 7.2.3.1, pages 7-81 and 7-83).

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.46 Hydrologic Balance: Sedimentation Ponds

Existing Environment and Applicant's Proposal

The discussion of Sediment Ponds can be found in Volume 2, Section 7 (pages 7-1 through 7-96) of the MRP.

The undisturbed and disturbed area of the Huntington #4 Mine is contained within a large, single drainage area. In order to minimize additional sediment loading to Mill Fork Creek, a major portion of this drainage is diverted before it reaches the disturbed area. Runoff from the disturbed area is routed into sedimentation structures located in the canyon bottom above Mill Fork Creek (MRP, Section 7.2.3.1, page 7-62).

The overall drainage of the area, including locations of the sediment structures, is depicted on Plate 7-6. Specifications are given below.

Sediment ponds are located below the coal stockpile loading area (See Plate 7-6.) The applicant states (page 7-63 of the MRP) that this site offers the most effective sedimentation control with the least amount of environmental disturbance.

The applicant has built two smaller ponds in a series to minimize environmental degradation and still obtain adequate storage. The upper pond functions as a holding and settling facility for disturbed area runoff. The lower pond filters, cleans and discharges underground mine water, as well as overflow from the upper pond in the event a storm exceeds the design. Surface drainage from the disturbed area passes into the upper pond and through a 12-inch culvert with an inverted inlet into the lower pond where it is filtered through a dike of coke breeze and slag and discharged to Mill Fork Creek as required by the NPDES permit (MRP, page 7-63).

To comply with requirements of the regulatory authority for the control of sedimentation as listed in the Underground Mining General Performance Standards, the ponds are constructed in a manner to facilitate the holding and settling of contaminated water from the minesite, as well as filtering and discharge of underground mine water. An overflow is provided in the event of a massive inflow of surface water exceeding the capacity of the ponds. The ponds are cleaned as necessary and the waste material placed in an approved disposal site (MRP, pages 7-63, 7-63a).

The construction of the ponds is per specifications of the State Engineer, U. S. Forest Service, Office of Surface Mining and the DOGM.

The following construction specifications (page 7-64 of the MRP) were followed:

1. In areas where any fill material was placed, the natural ground was removed for at least 12 inches below the base of the structure.
2. Compaction of all fill materials was at least 95 percent. Native material was used wherever practical. Fill was placed in lifts not exceeding 12 inches and was compacted prior to placement of the subsequent lift.
3. Riprap was placed on the water side of all outlets to prevent scouring. Inside slopes are 3:1 minimum.
4. Dams were constructed to overflow at least one foot below the top.
5. Overflows have a minimum depth of one foot and a minimum width of three feet. These are constructed (or lined) with at least one foot of riprap on all surfaces and discharge into an energy dissipator to prevent scouring.
6. A filter dike, composed of coke breeze and slag, is provided in the lower pond as a final filter for water prior to discharge.
7. All construction of sediment ponds was performed under the direction of a qualified professional.

Design rainfall of 2.3 inches for the 10-year, 24-hour event was determined from the "Precipitation Frequency Atlas of the Western United States" (NOAA Atlas 2, Volume IV - Utah, 1973) for the location of the Huntington #4 Mine. Corresponding rainfall depth for the 25-year, 24-hour event was estimated to be 2.9 inches. The Fletcher-Farmer rainfall distribution was used to determine the rainfall distribution. Total runoff from the 10-year, 24-hour rainfall is estimated as 1.23 ac-ft. An additional 0.18 ac-ft is retained to provide at least one year sediment storage for sediment yield from disturbed areas as estimated below (MRP, page 7-67).

The sedimentation ponds are inspected after each storm and the sediment is cleaned out as necessary. In no case is sediment allowed to build beyond the point of reducing the pond capacity below 1.23 ac-ft. Removed sediment is disposed of in the C. V. Spur refuse pile or other locations as approved by the regulatory authority (MRP, page 7-66).

The Universal Soil Loss Equation (USLE) was used to estimate sediment yield from disturbed areas. Sediment yield was calculated by estimating the erosion rate from disturbed subdrainage areas. All erosion was assumed to be delivered to and deposited in the pond (MRP, page 7-69).

Total sediment yield from disturbed areas is estimated to be 0.172 ac-ft per year (MRP, Section 7.2.3.2, page 7-72).

Ponds have a capacity of 1.45 ac-ft, sufficient to store the runoff from a 10-year, 24-hour event of 1.23 ac-ft plus one year sediment loss of 0.17 ac-ft. Since the excess capacity is only 0.05 ac-ft, both ponds will require regular maintenance to maintain sediment storage.

Spillways from both ponds are designed to pass the runoff from a 25-year, 24-hour precipitation event. Peak discharge from a 25-year, 24-hour precipitation event from the drainage above the ponds was determined using Sedimot II and the input parameters in Table 7-16. The peak discharge was determined to be 3.11 cfs (MRP, page 7-72).

A cross-section and profile of upper and lower pond spillways is provided in Plate 7-6 (MRP, page 7-73).

Design specifications are provided in Table 7-18. Velocities in both spillways exceed five ft/sec and would be erosive. Median riprap diameter of 15 inches is used to maintain stable spillways. Riprap of this size has a Manning's roughness coefficient of 0.04 and provides adequate protection for velocities in excess of 10 ft/sec (MRP, page 7-73).

Two water monitoring stations have been established at pond inlets and outlets (See water monitoring program for details.) (MRP, Section 7.2.6, page 7-89)

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.47 Hydrologic Balance: Discharge Structures

Existing Environment and Applicant's Proposal

The discussion on Discharge Structures can be found in Volume 2, Section 7 (pages 7-1 through 7-96) of the MRP.

The discharges from the diversion structures are onto a protective surface (i.e., conveyor belting or equivalent) and then into an area of rocks (or riprap) to dissipate the energy prior to allowing the drainage to run naturally. At the sedimentation ponds, overflows and channels are lined with riprap (see typical) to the point of final discharge into the ditch above the road (MRP, Section 7.2.3.1, pages 7-81 and 7-83).

Overflows have a minimum depth of one foot and a minimum width of three feet. They are constructed (or lined) with at least one foot of riprap on all surfaces and discharge into an energy dissipator to prevent scouring (MRP, Section 7.2.3.1, page 7-64).

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.49 Hydrologic Balance: Permanent and Temporary Impoundments

Existing Environment and Applicant's Proposal

Temporary impoundments on the Huntington #4 minesite include the two sediment ponds. These are covered in Section UMC 817.46 of this document. There are no permanent impoundments proposed at the Huntington #4 Mine.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.50 Hydrologic Balance: Underground Mine Entry and Access Discharges

Existing Environment and Applicant's Proposal

The applicant notes on page 7-16 of the MRP regarding the Blind Canyon Seam that the mine has encountered "small amounts of water from sandstones in the roof" and that "occasionally, damp to wet floor conditions exist."

The Hiawatha Seam lies approximately 100 feet below the elevation of the Blind Canyon seam (MRP, Section 7.1.5) and was accessed via rock slopes from the Blind Canyon portal. (Plate 3-6 of the MRP).

Page 3-56 of the MRP contains the details of the permanent portal seals to be installed upon final reclamation. The seals are designed to withstand up to 30 psi of pressure to contain any in-mine water accumulation following cessation of mining.

Page 3-56a contains a commitment to monitor any discharge (if it should occur) and provide treatment, if necessary, to satisfy the applicable State and Federal effluent limitations during the permit term.

Compliance

Based on the structure contour map (Plate 6-5), it appears that a portion of the workings in the Blind Canyon Seam would naturally drain from the existing portals. Upon reclamation, portal seals cannot guarantee that gravity discharges from the mine will not flow from other areas of the coal outcrop.

An evaluation of the portion of the workings which might potentially drain towards the portals along with the associated recharge area indicates that the probability of discharges from the workings is quite low. Based on the applicant's monitoring data to date, the only possible water quality concern associated with discharges from this mine would be increased total dissolved solids levels.

The applicant's proposal to monitor and provide treatment, if needed, for the permit term does not comply entirely with the requirements of this section. Any discharges which occur postmining must be sampled to assess if the effluent limitations of UMC 817.42 and all applicable State and Federal water quality standards are met.

Stipulation 817.50-(1)-JW

1. The applicant shall sample on a quarterly basis until bond release any discharges from the underground workings which occur after mining. Sampling will assess if discharges are

in compliance with the effluent standards of UMC 817.42 and all other applicable State and Federal regulations. The applicant will provide treatment, if necessary, of any discharges to achieve compliance with applicable standards during the period of discharge.

UMC 817.52 Hydrologic Balance: Surface and Ground Water Monitoring

Existing Environment and Applicant's Proposal

The proposed surface water monitoring program includes sampling sites above and below the minesite in the Mill Fork Canyon drainage, at the inflow and outflow of the sedimentation pond system, one seep, and one spring site in the Little Bear Canyon drainage north of the Huntington #4 lease area (Plate 7-3 of the MRP).

Figure 7-9 (page 7-86) and Figure 7-10 (page 7-90) of the mine plan show the frequency of sampling for all proposed surface sampling sites. Page 7-91 shows the water quality parameters to be analyzed and field measurements to be taken for surface water monitoring.

The applicant's ground-water monitoring proposal involves sampling the previously noted seep and spring in Little Bear Canyon, north of the Huntington #4 lease area. Additionally, the applicant notes on page 7-21 of the MRP that one exploration drill hole has been drilled into the Star Point Sandstone which lies immediately below the Hiawatha Coal Seam. The Star Point Sandstone and the lower portion of the Blackhawk Formation are considered to be the host rock for the only regional aquifer in the area. Water level data from this exploration hole were obtained over an eight month period. The applicant has also committed to a depth of water study on this aquifer prior to mining the Hiawatha Seam northwest of a line between drill holes DH-9 and MC-4-3 (page 7-23 of the MRP).

Compliance

The applicant's proposal for surface water monitoring adequately addresses the requirements of the regulations. The location of Stations 4-4-W and 4-5-W are favorable for assessing the impacts of reclamation activities at the minesite. The location and frequency of all stations should not be changed for postmining monitoring.

The applicant's ground water monitoring proposal of the seep and spring in Little Bear Canyon is adequate to assess impacts of mining on the only significant ground water resource in the immediate area.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.53 Hydrologic Balance: Transfer of Wells

Existing Environment and Applicant's Proposal

A listing of all drill holes on the Huntington #4 lease area is contained in Table 6-2, page 6-13 of the MRP. Drill hole MC-4-1 appears to be the only hole presently open. It is utilized for water level measurements and was drilled from within the Blind Canyon Seam workings.

Compliance

Because the only open drill hole will be inaccessible after retreat mining of the Blind Canyon Seam, the applicant could not transfer drill hole MC-4-1 for use as a water well. The applicant complies with this section.

Stipulations

None.

UMC 817.54 Hydrologic Balance: (UCA 40-10-29[2]) Water Rights Replacement

Existing Environment and Applicant's Proposal

Appendix I of the MRP contains an agreement between Huntington City and Swisher Coal Company, Beaver Creek Coal Company's predecessor. The agreement commits the Company to replace the water supply from Little Bear Spring, an important municipal water supply, if mining activities impact the spring.

Page 3-27 of the mine plan notes that the coal company would replace water impacted by mining with its shares of water in Huntington Creek.

Appendix 4 contains a stock certificate for 800 shares of water in the Huntington Cleveland Irrigation Company. The certificate is issued to Hardy Coal Company. Table 7-8 of the MRP lists filed water rights in and around the Huntington #4 minesite. Plate 7-7 shows the locations of the water rights listed in Table 7-8.

Compliance

The applicant has permanently terminated all mining activities in both the Blind Canyon and Hiawatha coal seams. Plates 3-5 and 3-6 indicate the mining in the Blind Canyon seam stopped well short of the fault system which may feed the Little Bear Spring and the mining in the Hiawatha seam never developed beyond the initial entries. The following analysis was developed prior to permanent abandonment and is still applicable insofar as postmining may result in possible, though not probable ground-water impacts.

The North Emery Water Users Association has expressed concern that mining activities at the Huntington #4 Mine may impact one of three springs located in Rilda Canyon, due south of the Huntington #4 lease area. These springs are an important culinary water supply for North Emery County. The West Appa Rilda Canyon Mine Permit Application contains information using Very Low Frequency Electromagnetic Analysis (VLFEM) which was used to identify a north-south trending lineament intersecting the North Spring area. This is thought to be a fracture system acting as a supply conduit for the North Spring in Rilda Canyon.

The VLFEM analysis is limited in that only two transects were run in Rilda Canyon. Further, the Hiawatha Seam outcrops in Mill Fork Canyon. If the north-south trending lineament was hydrologically active directly under the Hiawatha Seam, the effects of the lineament in acting as a flow conduit would be apparent in Mill Fork Canyon. No effects of the north-south trending lineament are apparent in Mill Fork Canyon. Therefore, until further data reveals more conclusively that the north-south lineament in Rilda Canyon is hydrologically active up into the Huntington #4 lease area, no mitigation measures are recommended.

The applicant has provided a list of filed water rights for the Huntington #4 Mine area. Those rights which may be potentially impacted by mining are shown on Table 7-8 (page 7-20 of the MRP) with the acre-foot allotment. Using the information from Table 7-8, the 800 shares of Huntington-Cleveland Irrigation Company owned by Beaver Creek Coal Company and the average discharge rate for Little Bear Spring shown on page 7-34 of the MRP, the following analysis was generated:

Total water rights which could be impacted:

12.99 ac-ft	(Table 7-8 of the MRP)
477.82 ac-ft	(Little Bear Spring)
<u>490.81 ac-ft</u>	

Less water rights held by Beaver Creek Coal Company for replacement:

$$\frac{264.00 \text{ ac-ft}}{226.81 \text{ ac-ft}} = \text{Net Deficit}$$

The applicant's proposal to replace water rights impacted by mining with 800 shares of Huntington-Cleveland Irrigation Company water rights will address approximately 54 percent of the total existing rights which could be impacted. It is unlikely that 100 percent of the existing water rights would be impacted. Ninety-seven percent (97%) of the existing water rights are composed of the flow from Little Bear Spring (477.8 ac-ft of 490.8 ac-ft total). Should Little Bear Spring be totally diminished by mining activities, the existing 800 shares of Huntington-Cleveland Irrigation Company water would not be enough to replace the flow from Little Bear Spring. However, the written agreement (Appendix 1) binds the coal company to replacement of water for Little Bear Spring even if the spring was totally interrupted.

To assure that the replacement water is without legal complication as to ownership, the applicant must show that the 800 shares of Huntington-Cleveland Irrigation Company issued to Hardy Coal Company have been legally transferred or assigned to Beaver Creek Coal Company.

Stipulation 817.54-(1)-JW

1. The applicant shall provide, within 60 days of permit approval, documentation of assignment or transfer of 800 shares in the Huntington-Cleveland Irrigation Company from the Hardy Coal Company to Beaver Creek Coal Company.

UMC 817.55 Hydrologic Balance: Discharge of Water into an Underground Mine

Existing Environment and Applicant's Proposal

The applicant does not propose to route drainage into any of the portal entries. The drainage control plan for the upper pad depicted on Plate 7-4 of the MRP shows that surface drainage will be conveyed away from portal entries.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.56 Hydrologic Balance: Postmining Rehabilitation of Sedimentation Ponds, Diversions, Impoundments and Treatment Facilities

Existing Environment and Applicant's Proposal

The applicant notes (MRP, Section 3.5.2.3, page 3-58) that sedimentation ponds, dams and diversions will be disposed of during reclamation. No permanent hydrologic structures are planned for the Huntington #4 Mine.

Compliance

The applicant has not provided a specific timetable for removal of these temporary structures during reclamation. The ponds will be left in place until the reclaimed surface facility area is revegetated.

The applicant complies with this section.

Stipulations

None.

UMC 817.57 Hydrologic Balance: Stream Buffer Zones

Existing Environment and Applicant's Proposal

Page 3-28 of the MRP notes that a buffer zone is established between the northern portion of the haul road near the sediment ponds and the Mill Fork stream channel. Road maintenance and snow removal operations were the primary activities which occur within this zone. The applicant commits to blading snow to the north of the road (away from the stream) and to conducting all road maintenance activities in a manner that directs material away from the stream side. On page 3-28a (MRP), the applicant commits to remove snow or other accumulations of material bladed to the north of the road in the buffer zone to an approved storage or disposal area as soon as practicable. The approved storage locations are shown on Plate 3-1a. Sediment control for the storage areas will be straw bale dikes.

The applicant has also agreed to conduct monthly analysis of total suspended solids levels at Stations 4-4-W and 4-5-W to determine the adequacy of the sediment control measures that have been proposed (page 7-91, MRP).

Compliance

The applicant's establishment of a stream buffer zone is somewhat inconsistent in that a 100 foot zone is not actually in place. Mining activities are within 100 feet of Mill Fork Creek.

Based on benthic invertebrate data in the U. S. Geological Survey Open File Report 81-539, a biological community as defined in UMC 817.57(c) is present in Mill Fork Creek.

The sediment contributions from the haul road which enter the Mill Fork stream are a significant environmental concern. Site visits in the early spring of 1983 showed that snow removal operations generate large amounts of earth material which is frequently placed in or just adjacent to the stream channel.

An analysis of total suspended solids (TSS) for the period March 1982 through July 1983 shows a pattern of significant sharp increases in total suspended sediments between Stations 4-4-W and 4-5-W (both on Mill Fork Creek). This concurs with on-site observations of sediment loading from snow removal operations.

The applicant's proposal for snow removal and road maintenance activities within the stream buffer zone is adequate to address this concern. The on-going evaluation of the total suspended solid levels at Stations 4-4-W and 4-5-W to be made by the applicant on a monthly basis will determine if the measures proposed are working adequately. If TSS levels between Stations 4-4-W and 4-5-W show increases of greater than 200 mg/l which can most likely be attributed to mining activities, then additional sediment control measures will be proposed, approved and implemented by the applicant (page 7-91, MRP).

The Division, pursuant to UMC 817.57(a)(1) and (2) approves the applicant's proposal to conduct underground coal mining activities within 100 feet of Mill Fork Creek. However, with the initiation of reclamation activities in 1985, little road use or snow removal is anticipated.

The applicant is in compliance with this section based on the applicant's commitment on page 7-91 of the MRP.

Stipulations

None.

UMC 817.59 Coal Recovery

Existing Environment and Applicant's Proposal

The Huntington #4 Mine produced coal from the Blind Canyon Seam and the Hiawatha Seam using room-and-pillar methods that were consistent with the best technology currently available. Recovery within the room-and-pillar panels was approximately 75 percent to 78 percent, with an overall recovery factor (including barriers) estimated at 50 percent, (page 3-15 of the MRP).

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.61-.68 Use of Explosives

Existing Environment and Applicant's Proposal

No blasting is employed at this site as outlined in Section 3.3.5.4 of the MRP.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.71-.74 Disposal of Excess Spoil and Underground Development
Waste: General Requirements; Valley Fills; Head-of-
Hollow Fills; Durable Rock Fills

Existing Environment and Applicant's Proposal

All development waste was disposed of in underground "gob" areas which consist of entries and cross-cuts no longer needed for the operation of the mine. No development waste was stored on the surface at this operation as stated in Section 3.3 of the MRP.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.81-.88 Coal Processing Waste: Banks

Existing Environment and Applicant's Proposal

There were no coal processing facilities planned for use at the Huntington #4 Mine. All raw coal will be hauled from the site as stated in Section 3.3 of the MRP.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.89 Disposal of Noncoal Waste

Existing Environment and Applicant's Proposal

Noncoal waste is temporarily stored in steel dumpsters and hauled, by contractor, to the approved Carbon County Landfill on an as-needed basis (MRP Section 3.3).

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.91-.93 Coal Processing Waste: Dams and Embankments

Existing Environment and Applicant's Proposal

The applicant did not construct any dams or embankments constructed of coal processing waste or to impound coal processing waste. The coal was transported to Beaver Creek Coal Company's C. V. Spur Preparation Plant 35 miles away (MRP, Section 3.3).

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.95 Air Resources Protection

Existing Environment and Applicant's Proposal

Fugitive dust emissions from traffic over unpaved road surfaces are controlled through water sprays, chemical suppressants and reduced vehicular speed (25 mph in Mill Creek Canyon). Neither the Utah Bureau of Air Quality nor the Environmental Protection Agency has established any air quality monitoring requirements for the area of the Huntington #4 Mine and no air quality monitoring by the applicant is planned (MRP Sections 3.4.7.2 and 11.2.2).

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.97 Fish, Wildlife and Other Related Environmental Values

Existing Environment and Applicant's Proposal

The Fish and Wildlife Resource Information for the Huntington #4 Mine area is discussed in Chapter 10 of the MRP.

A wide variety of wildlife species utilize the highly variable habitats within and adjacent to the permit area. Economically important and high interest species which potentially inhabit the area include mule deer, elk, moose, beaver, bobcat, coyote, mountain lion, snowshoe hare, fox and flying squirrel. Twenty-nine species of birds, including gamebirds and raptors, are listed as being of high State interest.

Seven species of raptors have been observed on the permit area and nesting areas for red-tailed hawks, sharp-shinned hawks, American kestrels, great horned owls and golden eagles have been located on-site (MRP, Section 10.3.2.4). Gamebirds include blue grouse, ruffed grouse and mourning doves.

Of the 22 species of migratory birds of high Federal interest listed by the U. S. Fish & Wildlife Service (USFWS) for the Uintah-Southwestern Utah Coal Production Region, nine are actually or potentially present on the permit area. These are the bald eagle, golden eagle, peregrine falcon, band-tailed pigeon, Cooper's hawk, flammulated owl, prairie falcon, Williamson's sapsucker, black swift and western bluebird. One active golden eagle nest has been found on the permit area (letter from USFWS to OSM dated September 30, 1983).

The major aquatic habitats within the permit area are Mill Fork and Little Bear Creeks. All surface facilities are within Mill Fork Canyon. Based on benthic macroinvertebrate and aquatic habitat surveys conducted by the operator as well as data provided by the Utah Division of Wildlife Resources (UDWR), neither creek supports game or nongame fish and both lack sufficient flow in most years to provide spawning sites (MRP, Section 10.3.2.1). However, these streams probably contribute some invertebrate food items and a small amount of surface flow to Huntington Creek, an important fishery in the region.

The most important aspect of these streams is their contribution to riparian habitat for wildlife. Approximately 1.4 acres of riparian vegetation exists on the lease area (MRP, Table 9-1). Of this, .03 acres have been disturbed (Appendix 8, page 1). This habitat type is listed by UDWR as high priority due to availability of water and compositional diversity of the plant community. Other high priority areas include seeps and springs, as well as cliffs which afford nesting sites for many species of raptorial birds.

Habitats in and around the Huntington #4 permit area include areas of high priority summer range and crucial-critical winter range for both deer and elk (MRP, Figure 10-6, 10-7). No specific elk calving or deer fawning areas have been identified in the study area. A portion of the study area provides moose winter range, but field studies indicate that preferred habitat is quite limited (MRP, Section 10.3.3.1).

Listed threatened and endangered species potentially present in the study area are the American peregrine falcon, arctic peregrine falcon and the bald eagle. None of these species have been observed on the area and are not likely to occur because habitats in the area are marginal (MRP, Section 10.3.3.1).

Beaver Creek Coal Company has committed to avoiding important habitats such as riparian areas, and has committed to not using persistent pesticides and to preventing fires (MRP, Sections 10.5.1

and 3.3.5). Also, employee awareness programs inform mine personnel of sensitive periods or habitats, such as deer fawning seasons and areas, critical winter ranges, etc., to minimize impacts to wildlife (MRP, Section 10.5.5.1).

Fencing will be designed to allow passage of wildlife without entanglement or disturbance to migratory patterns, and mule deer roadkills along the Mill Creek access road and the Huntington Canyon road are monitored by Beaver Creek personnel (MRP, Section 10.5.5.1).

The operator has committed to reporting any observations of threatened and endangered species not previously reported on the permit area to the regulatory authority, UDWR and the USFWS. Active nests and nest trees, if located, will not be disturbed (MRP, Sections 10.5.1.2 and 10.7).

Habitat loss or deterioration of the Mill Fork aquatic ecosystem has been limited by the establishment of a 100 foot buffer zone adjacent to the stream where possible (see TA, Section UMC 817.57) and constructing sediment ponds to protect the stream from an increased sediment load from the mine-affected areas. In addition, monthly inspections of sediment load in Mill Fork are conducted (MRP, Section 10.7).

During the first suitable planting season following mining, the applicant will implement permanent revegetation methods designed to restore and enhance wildlife habitat on disturbed areas. The revegetation planting mixture includes herbaceous and woody species that are adapted to on-site conditions and are of known value to wildlife for cover, forage or both (MRP, Section 3.5; Appendix 8, Attachment A).

Beaver Creek Coal Company will conduct a wildlife monitoring program throughout the operational life of the Huntington Canyon #4 Mine. The monitoring program will utilize the services of a full-time environmental specialist and, as necessary, professional consultants to evaluate the ongoing success of operational mitigation measures, ensure that threatened or endangered species and sensitive or critical use areas remain undisturbed by future activities, deal with any unforeseen difficulties which might arise, and participate in reclamation efforts upon completion of the project (MRP, Section 10.7).

Compliance

The Huntington #4 Mine has been in operation since 1977. The surface disturbance and associated loss of wildlife habitat has already occurred. No additional surface disturbances are planned.

Therefore, the mitigation and management plans focus on minimizing impacts related to continued mining activities and returning the site to suitable habitat after cessation of mining (MRP, Section 10.5).

In an effort to characterize the fish and wildlife resources and assess potential impacts, the applicant has conducted numerous surveys on the permit area as well as a thorough literature search of the UDWR files and other publications on the distribution and status of vertebrates in the study region.

Surveys to determine the presence of any critical habitat of a threatened or endangered species, any plant or animal listed as threatened or endangered or any bald or golden eagle have been conducted. Three golden eagle nests have been located on the permit area (letter from USFWS to OSM dated September 30, 1983). Two nests are old and one was active in 1982 (MRP, Figure 10-8a). The company has committed to mitigate impacts to nests from subsidence by replacing the nests, establishment of alternative nest sites or other site-specific measures agreed upon between the USFWS and Beaver Creek Coal Company (MRP, page 10-67a).

A commitment to report any threatened and endangered species observed on the permit area during operations has been made.

The potential raptor electrocution hazard posed by existing powerline pole configurations on-site has been determined by USFWS to not require corrective modification as long as raptor mortality continues not to occur (letter from USFWS to DOGM dated October 9, 1981) and no additional powerlines are proposed for construction (MRP, Section 3.2.13); instead, powerlines will be removed during reclamation.

The applicant has committed to protect and avoid habitats of high value for fish and wildlife including riparian areas, seeps and springs, fawning areas, critical winter areas, etc. (MRP, Section 3.4.6.2). If seeps and springs are adversely impacted by subsidence, efforts to restore or replace lost water will be made. This will be accomplished by attempting to reopen the previous flow area or by dedicating water rights to develop an alternative source (MRP, Section 10.5.1.1).

If monitoring indicates that mule deer roadkills are a problem, the company has committed to consult with UDWR for mitigation measures (Section 10.7). Adequate plans for permanent revegetation of the site have been provided (MRP, Section 3.5; Appendix 8) and determined adequate (see TA, Section UMC 817.111-.117). Species to be used for revegetation have been selected based on nutritional value and cover for fish and wildlife and ability to support and enhance fish and wildlife habitat after bond release. Plants will be grouped in a manner which optimizes edge effect.

Stipulations

None.

UMC 817.99 Slides and Other Damage

Existing Environment and Applicant's Proposal

The applicant has committed to notify the Division at any time a slide occurs which may have a potential adverse affect on public property, health, safety and environment in Section 3.3.2.5 of the MRP and abide by appropriate mitigation measures as required by the Division.

Compliance

Applicant complies with this section.

Stipulations

None.

UMC 817.100 Contemporaneous Reclamation

Existing Environment and Applicant's Proposal

The applicant has committed to contemporaneous reclamation of disturbed areas as they become available (MRP, Section 3.5.1). Areas will be backfilled, graded, topsoiled and revegetated to acceptable reclamation standards established by environmental baseline studies (see TA, Section UMC 817.111-.117).

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.101 Backfilling and Grading: General Requirements

Existing Environment and Applicant's Proposal

The yards, roads, and portal areas were dozed out of very steep rocky canyon walls in the 1940's. The area will be smoothed and contoured to be compatible with postmining land uses (as described in UMC 817.133 of the TA), and available topsoil will be respread

over the area to ensure the success of the revegetation. This is outlined in Section 3.5.3 of the MRP, with the time schedule found in Section 3.5.6.1.

In general, the backfilling and regrading will proceed as follows:

- a. After sealing of the portals and removal of all structures, a backhoe (Cat 235 or larger) will be brought to the upper portal.
- b. The backhoe will reach down over the fill bank, retrieve material, and place it on the terrace.
- c. A cat (D-7 or larger) will work with the backhoe, taking the retrieved material and spreading and compacting it from the highwall outward to reach the configuration as shown on Plate 3-8, Postmining Topography. Compaction of 90 percent or greater will be accomplished by spreading the material in lifts not to exceed 15 inches and tracking over it with a dozer.
- d. The upper pad will be sloped to drain to the center. A rock-lined natural drainage will be restored in this area since all diversions will have been removed during the backfilling and regrading.
- e. The procedure will continue down the upper road with the backhoe and cat operating in conjunction to reclaim this area to the property line.
- f. From the coal storage area to the lower pad (including the lower road) and drainfield area, a similar method of reclamation will be employed.

Plate 3-8 locates proposed "retained" highwalls on the south-facing slope of the canyons. Cliffs and rock exposures are common on the south-facing slopes in this area. The "retained" highwalls are compatible in height and length to existing cliffs in the area and have a Static Safety Factor (SSF) of 3.00 for dry conditions and 2.73 for saturated conditions (MRP, page 3-64b). The structural composition is consistent with pre-existing cliffs in the surrounding terrain, the cliff units in the coal bearing Blackhawk Formation.

Final graded areas will have a safety factor of 2.20 for dry conditions and 1.65 for saturated conditions (page 3-64e of the MRP). The embankment material will be placed in maximum 36-inch lifts and compacted to 90 percent.

Compliance

The applicant complies with this section.

Stipulations

None.

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

Existing Environment and Applicant's Proposal

All exposed coal outcrops will be covered with incombustible material during the backfilling and grading operation as outlined in Section 3.5.3 of the MRP.

This is not a processing facility and, therefore, toxic-forming materials or acid-producing materials are not produced or require disposal. All clean-up will be done before soil placement as stated in Section 3.5.6.1 (time schedule for reclamation).

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.106 Regrading and Stabilizing of Rills and Gullies

Existing Environment and Applicant's Proposal

Rills or gullies deeper than nine inches in regraded areas will be filled, graded or otherwise stabilized and reseeded. Rills and gullies less than nine inches deep as specified by the regulatory authority will be stabilized and the area reseeded and replanted if the rills or gullies are disruptive to the approved postmining land-use. This final configuration is shown on Plate 3-8 of the MRP. Rills and gullies are described in Section 3.5.3.2 of the MRP.

Compliance

The applicant complies with this section.

Stipulations

None.

Existing Environment and Applicant's Proposal

The Huntington Canyon #4 Mine lease area is generally located within the pinyon-juniper vegetation zone as described by Cronquist, et al (1972). The elevation ranges from approximately 7,200 feet to 9,580 feet. Precipitation varies with elevation and ranges from approximately 15 to 20 inches annually, with 60 to 70 percent occurring as snow during the months of October through May.

Eight vegetation types are delineated on the permit area (MRP, Plate 9-1). These include aspen woodland, mixed coniferous forest, burned mixed coniferous forest, pinyon-juniper-curleaf mountain mahogany woodland, manzanita shrubland, big sagebrush shrubland, riparian and mountain grassland. The pinyon-juniper-curleaf mountain mahogany woodland and riparian communities occur in the area of disturbance.

No threatened or endangered plant species were encountered during floristic surveys of the permit area. According to the USFWS, only one species of concern (Hedysarum occidentalis var. canone) may occur on the permit area (USFWS memorandum to OSM, Denver, October 21, 1983). It is under review for possible listing in the future.

As described in Section 9.2.3 of the MRP, a pinyon-juniper-mountain mahogany reference area was selected and permanently marked. It was selected as representative of the topography, soils, aspect and species composition of the majority of the disturbed area. The reference area is one hectare in area and is located within the permit area on a site which will not be disturbed during the life of the mine. The Soil Conservation Service (SCS) has determined that the established reference area is in good condition. If this condition deteriorates to a poor classification, the applicant will implement management techniques to attain at least fair conditions. Management plans will be developed in consultation with the U. S. Forest Service (USFS) and SCS.

The reference area was sampled for total vegetation cover, cover by bare soil, cover by litter and rock, cover by species, productivity and tree and shrub density. Sample adequacy or minimum sample size was attained for all parameters (Table 9-6, page 9-22 of the MRP).

The applicant has proposed to use the riparian area 100 m upstream and downstream of the disturbance as a reference comparison area (MRP, Appendix 8). This is acceptable due to the small amount of disturbance associated with the mining operation (.03 acre) and the limited amount of surrounding riparian vegetation.

Compliance

The applicant has presented a revegetation plan in Section 9.7 of the MRP which describes procedures and planting mixtures for reclamation of temporarily disturbed areas and those pinyon-juniper-curlleaf mountain mahogany areas disturbed for the life of the mine. Seeding of grasses and forbs as well as planting of shrub seedlings will occur during the first desirable planting season after final grading, either during the spring (March 15-June 15) or fall (September 15-November 15).

The planting mixture for final revegetation of the pinyon-juniper-curlleaf mountain mahogany vegetation type consists primarily of native grasses, forbs and shrubs (Tables 3-1 and 3-2 of the MRP). Fairway crested wheatgrass (included at the request of the land managing agency; letter from Reed Christensen, Forest Supervisor, U. S. Forest Service, to the Division dated October 30, 1981) and cicer milkvetch are the only introduced species included. The seed mixtures will be spread either by hand or machine, depending on site conditions.

A variety of synthetic and organic mulches will be used, dependent on site conditions. Organic mulches will be applied at a rate ranging from 1,500 - 2,500 pounds per acre. Synthetic devices will be installed according to the manufacturer's recommendations (Section 3.5.4.3 of the MRP).

A complete revegetation plan for the riparian area which includes a suitable seed mixture, dates of planting, methods of mulching and plans for monitoring is presented in Appendix 8 of the MRP.

Final reclaimed areas will be monitored at least every two years following plant establishment until bond release. A detailed monitoring plan which includes revegetation success standards is presented in Section 3.5.5 of the MRP.

The final reclaimed area, the reference area and the riparian comparison area will be sampled for cover, woody plant density and species composition during each monitoring period. Production will be sampled and compared on the pinyon-juniper reclaimed and reference areas. Sampling techniques are discussed in Section 3.5.5 of the MRP. Since comparison of production is not necessary on areas to be developed for fish and wildlife management (UMC 817.116 [b][3][iv]), no production sampling will be implemented on the riparian area.

The Huntington #4 minesite receives approximately 15 to 20 inches of precipitation annually. This amount is sufficient for the establishment of many of the species native to the area. The introduced species, Fairway crested wheatgrass and cicer milkvetch, applied in the rates provided, are valuable to control erosion, and as wildlife forage. One plant species, Hedysarum occidentale var. canone, under review for possible listing as threatened or endangered, may be present on the permit area according to USFWS. However, no populations have been identified (MRP, Table 9-7).

The applicant complies with this section.

Stipulations 817.111-.117-(1, 2, 3)-SC

1. Within 15 days of permit approval, the operator must revise the permanent seed mixture for the riparian area by including at least two forb species. The species must meet all the requirements of this section and UMC 817.97.
2. Within 15 days of permit approval, the operator must revise the tree seedling stocking rate for the pinyon-juniper-mountain mahogany vegetation type (Table 3-2) by replacing the pinyon and juniper seedlings with an equal number of seedlings of woody shrub species native to the area. The species must meet all the requirements of this section and UMC 817.97.
3. Before any site redisturbance occurs, the permittee must conduct a survey, under the supervision of the regulatory authority, of the areas to be redisturbed. The survey shall identify and record locations of individuals and populations of Hedysarum occidentale var. canone (canyon sweetvetch). If canyon sweetvetch is found in portions of the permit area to be redisturbed, the permittee must develop and submit a mitigation plan for regulatory authority approval and after approval implement this plan before redisturbance occurs.

UMC 817.121-.126 Subsidence Control

Existing Environment and Applicant's Proposal

As discussed on page 3-44 of the MRP, there are no man-made structures above the mine, either currently in use or of historical significance and, therefore, in need of protection from subsidence. Due to the steep topography, lack of water and poor access, the U. S. Forest Service (USFS) has classified most of the land under their jurisdiction above the mine as nonrange. The only significant ground water resource, the Star Point Sandstone, is located

stratigraphically below the coal seams being mined. Yearly surface inspections since 1979 have disclosed no surface manifestations of subsidence.

Beaver Creek Coal Company is presently following a monitoring plan established under an August 27, 1979 Cooperative Agreement with the Manti-LaSal National Forest, USFS, U. S. Department of Agriculture (see MRP, Figure 3-5). A photogrammetric monitoring program, as opposed to a subsidence monitoring survey net, was initiated at the insistence of the USFS to minimize the surface disturbance associated with subsidence monitoring. This includes an on-the-ground visual inspection which will be performed twice each year and will assess the condition of the surface above all underground mine workings and areas that may be affected by subsidence.

Compliance

The extraction technologies described in Sections 3.3.1 and 3.4.8.2 of the MRP adequately comply with UMC 817.121(a). Further, the operator has complied with certain provisions of UMC 817.121(b) by including a survey of renewable resource lands (Section 3.4.8.1 of the MRP) and discussing estimated subsidence impacts and a subsidence monitoring plan (Sections 3.4.8.2 - 3.4.8.4 of the MRP).

The Huntington #4 MRP addresses public notice of the mining schedule (UMC 817.122) and surface owner protection (UMC 817.124[b]) in Section 3.4.8.3, page 3-47.

The specific content and temporal framework for submittal of an annual subsidence report (UMC 817.121[b]) is discussed in Section 3.4.8.4, page 3.5.

The applicant is in compliance with these sections.

Stipulations

None.

UMC 817.132 Cessation of Operations: Permanent

Existing Environment and Applicant's Proposal

Permanent cessation of operations occurred on November 1, 1984, final reclamation will commence spring 1985. Mine openings will be sealed, all surface equipment, structures and facilities associated with the operation will be removed, and all affected lands reclaimed (MRP, Section 3.5.2). The schedule for permanent reclamation can be found in Section 3.5.6.1.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.133 Postmining Land Use

Existing Environment and Applicant's Proposal

The land on which the #4 Mine is located has long been used for coal mining. This canyon has supported three (3) underground operations in the past with the present surface facilities located in exactly the same area as one of these, the old Leamaster Mine, which operated nearly 25 years ago. Other than coal mining, this area has been used for deer hunting, sightseeing and hiking. There are no developed campgrounds within the area and none planned for the future (Section 4.4.2 of the MRP).

The USFS presently administers the lands in this area for livestock forage, wildlife habitat, watershed, dispersed recreation and coal mining. The USFS has, however, determined that the majority of the acreage on the lease tract is classified as nonrange and is not used for grazing because of slope, accessibility, rock outcrops, timber, scarcity of grazeable vegetation and lack of water. There are no range improvements within the permit area (Section 4.4.2 of the MRP).

The postmining uses of the land will be the same as the premining and present uses described above (Section 4.5 of the MRP). Mining operations have ceased, and the disturbed areas will be reclaimed and the land will once again support its principle premining uses (i.e., deer habitat, hunting, sightseeing, watershed and hiking).

Restoration of the area will be achieved by regrading the yards, reclaiming the roads and portal areas to a practical degree, planting all disturbed areas and monitoring the revegetation effort to achieve success standards, as discussed under UMC 817.111-.117 of this document.

Compliance

The applicant complies with this section.

Stipulations

None.

UMC 817.150-.157 Roads: Class I

Existing Environment and Applicant's Proposal

The coal haul road is approximately 900 feet inside the permit boundary and connects to the U. S. Forest Service (USFS) road in Mill Fork Canyon. The Mill Fork Road is controlled by the USFS and Beaver Creek Coal operates on this road under a Road Use Permit with the USFS. This lower haul road is sloped to the inside ditch (24" X 12" minimum) and is equipped with a guardrail, rather than a berm, on the outside to maintain adequate road width for haul trucks. Road drainage is passed through a culvert and directed to the sedimentation pond. (See MRP Plates 3-2a and 7-5 for the road cross-section and ditch details.)

Design of drainage controls along this road were specified by the USFS engineers in 1976 and this road has been constructed and maintained in accordance with their specifications. Details on the design, maintenance and use of this road are provided in the MRP, Appendix 6 - Road Use Permit/ Specifications on Mill Fork Road. The road is gravel surfaced and watered as necessary for dust control.

Compliance

The Division concurs that the coal haul road is a public road as outlined in "The Public Roads Criteria for Coal Haulage and Access Roads" memorandum as approved February 24, 1984 by Division Director, Dianne R. Nielson. The applicant complies with this section.

Stipulations

None.

UMC 817.160 Roads: Class II

Applicant's Proposal and Existing Environment

The mine access road was used for men and materials access to the minesite. The road is approximately 4,800 feet long. This road was built in the 1940's and upgraded in 1976-1977 to bring it to its present grade and alignment. The majority of the road lies above the massive Star Point Sandstone, and ongoing inspections of the road fill slopes have indicated no instability. There has been no evidence of creep, slippage or other failures due to instability. This road is gravel-surfaced and maintained regularly to provide safe access of men and materials to the minesite. This road has restricted access due to a gate. Plate 3-2A of the MRP outlines the typical road width and gradient.

March 24, 1986

TO: Coal File
FROM: *gh* John J. Whitehead, Permit Supervisor/Reclamation
Hydrologist
RE: Beaver Creek Coal Company Response to Special
Condition #4, Huntington #4 Mine, INA/015/004, #2,
Emery County, Utah

This memo is to document the receipt of Beaver Creek Coal Company's response to Special Condition #4 on the Huntington Canyon #4 Mine permit. Attached to their March 3, 1986 memo was a water rights certificate for 800 shares issued in the name of Beaver Creek Coal Company. This submittal completes the stipulation responses required for the Huntington #4 Mine.

btb
cc: Allen Klein
Tom Munson
Tom Wright
9291R-10

FILE COPY

EAST MOUNTAIN
CUMULATIVE HYDROLOGIC IMPACT
ASSESSMENT

Cottonwood/Wilberg Mine, ACT/015/019

Deer Creek Mine, ACT/015/018

Des-Bee-Dove Mines, ACT/015/017

Huntington #4 Mine, ACT/015/004

Crandall Canyon Mine, ACT/015/032

Emery County, Utah

July 1989

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I. INTRODUCTION

The purpose of this report is to provide a Cumulative Hydrologic Impact Assessment (CHIA) for East Mountain, located in Emery County, Utah. This assessment encompasses the probable cumulative impacts of all anticipated coal mining in the general area on the hydrologic balance and 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 legislation passed under Utah Code Annotated 40-10-1 et seq. and the attendant State Program rules under UMC 786.19(c).

East Mountain occurs within the Wasatch Plateau Coal Field, approximately 20 miles southwest of Price, 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.

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

GEOLOGY

Outcropping rocks of the Wasatch Plateau Coal Field range from Upper Cretaceous to Quarternary in age. The rock record reflects an overall regressive sequence from marine (Mancos Shale) through littoral (Star Point Sandstone) and lagoonal (Blackhawk Formation) to fluvial (Castlegate Sandstone, Price River Formation and North Horn Formation) and lacustrine (Flagstaff Limestone) 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.

VEGETATION

Vegetation of the Wasatch Plateau area is classified within the Colorado Plateau floristic division (Cronquist et al., 1972). The area occupies parts of both the Utah Plateaus and the Canyon Lands floristic sections. Vegetation communities of the area include desert shrub (shadscale) at the lowest elevations through sagebrush, sagebrush-grassland, pinyon-juniper, mountain brush, Douglas fir-white fir-blue spruce, and Engleman spruce-subalpine fir.

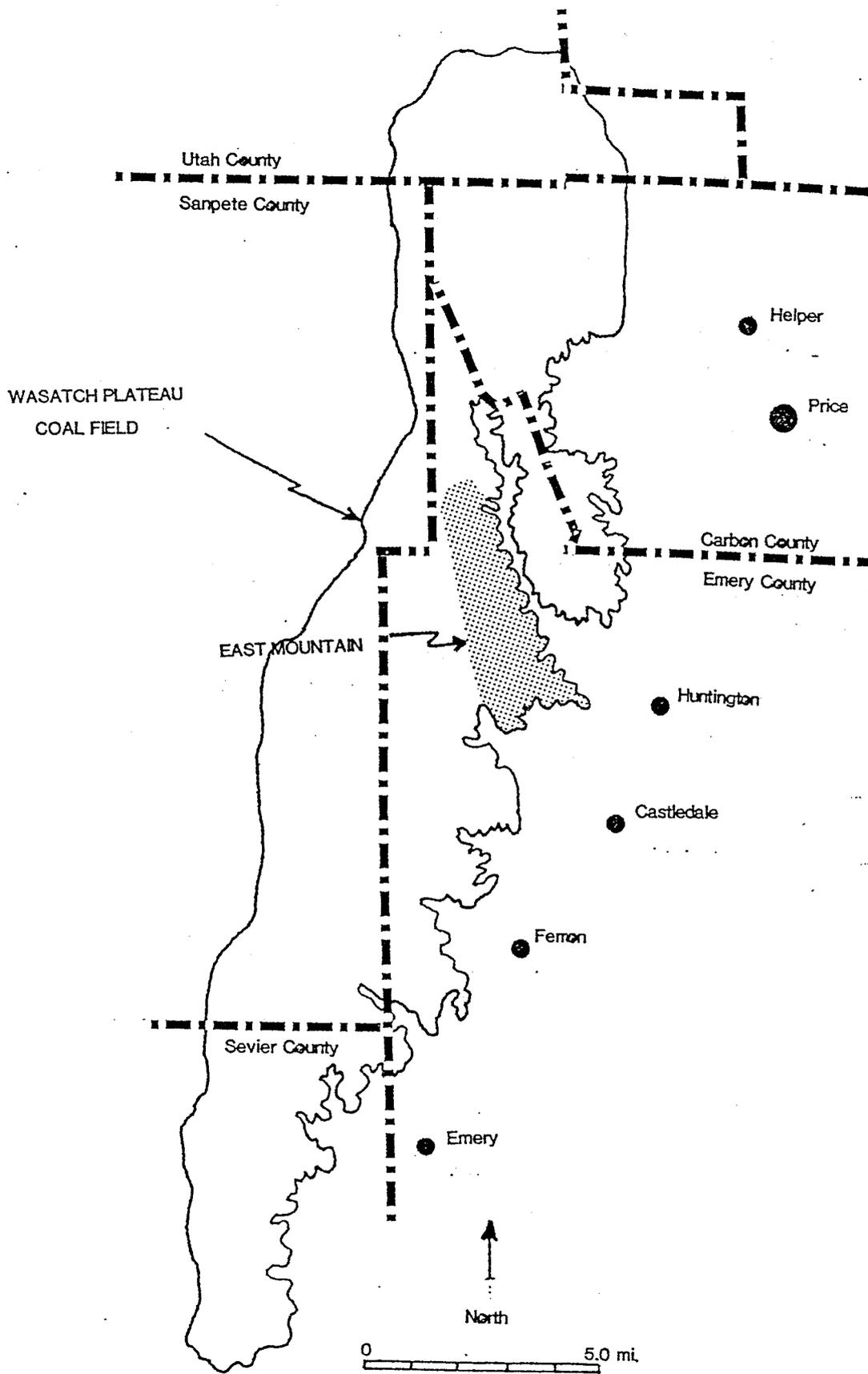


Figure 1. Wasatch Plateau Coal Field.

Desert shrub communities are sparsely vegetated shrublands that, depending on elevation and soils, may be dominated by shadscale (Atriplex confertifolia), fourwing saltbush (A. canescens), Castle Valley clover (A. cuneata) or mat saltbush (A. corrugata) and may include winterfat (Ceratoides lanata), Mormon tea (Ephedra spp.), budsage (Artemisia spinescens), miscellaneous buckwheats (Eriogonum spp.), Indian ricegrass (Oryzopsis hymenoides), galleta grass (Hilaria jamesii), grama grass (Bouteloua spp.), needle and thread grass (Stipa comata), sand dropseed (Sporobolus cryptandrus) and squirreltail (Sitanian hystrix). Greasewood (Sarcobatus vermiculatus) - saltgrass (Distichlis stricta) may dominate bottomlands.

Many sagebrush communities of the area are relatively dense shrub stands of (Artemisia tridentata) with very little understory growth. In relatively undisturbed sagebrush communities, rabbitbrush (Chrysothamnus nauseosus or C. viscidiflorus), Mormon tea, and several perennial grasses may be common, including thickspike and western wheatgrass (Agropyron dasystachyum and A. smithii), basin wildrye (Elymus cinereus), Indian ricegrass and dropseed species.

In the sagebrush-grassland type, the typical big sage may give way to Artemisia tridentata var. vaseyana (mountain big sage) with a co-dominant perennial grass understory. Salina wildrye (Elymus salinus) may be co-dominant in these communities and may dominate an herbaceous grassland type. Black sage (A. nova) with Salina wildrye or western wheatgrass understory is also common.

Pinyon-juniper woodlands occupy drier sites often with stoney to very rocky soils. Pinus edulis and Juniperus osteosperma are co-dominant in the overstory. Understory vegetation ranges from sparse to moderate ground cover on range sites in poor to excellent condition. Understory species include sagebrush, mountain mahogany (Cercocarpus montanus), snowberry (Symphoricarpus oreophilus), and several perennial grasses including slender wheatgrass (Agropyron trachycaulum), Salina wildrye, junegrass (Koeleria cristata) and Indian ricegrass.

Dominant shrubs of the mountain brush communities will vary depending on elevation and aspect. The drier south and west-facing slopes may support dense stands of Gambel oak (Quercus gambellii). Other dominants of this community may include serviceberry (Amelanchier utahensis), mountain mahogany (Cercocarpus montanus or C. ledifolius), bitterbrush (Purshia tridentata) and snowberry.

The range of the Douglas fir-white fir-blue spruce community is about 8,000 to 10,000 feet. Douglas fir (Pseudotsuga mensiesii) is usually the dominant tree with white fir (Abies concolor) and blue spruce (Picea pungens) usually limited to the most mesic sites, often along streams. With dense canopies, understory vegetation may be sparse. Common shrubs include serviceberry (Amelanchier spp.), Oregon grape (Berberis repens), chokecherry (Prunus virginiana), Rocky Mountain maple (Acer glabrum), mountain lover (Pachistima myrsinites) and snowberry. Bluebunch wheatgrass (Agropyron spicatum), mountain brome (Bromus carinatus), and Kentucky bluegrass (Poa pratensis) are common grasses. Aspen stands (Populus tremuloides) can be found throughout the zone, particularly in mesic sites and as successful communities.

Engelman spruce (Picea engelmannii) and subalpine fir (Abies lasiocarpa) dominate the spruce-fir zone at the highest elevations of the hydrologic impact area. While receiving about the same precipitation as the Douglas fir communities, lower evapo-transpiration with cooler temperatures can permit a more lush vegetation in the spruce-fir zone. Limber pine (Pinus flexilis) often occupies steep or rocky, drier sites of this zone.

Small riparian communities are found at all elevations within the impact assessment area. With greater water availability and cooler temperatures, the riparian zone often includes more mesic species, (e.g., those from a higher vegetation zone). Shrub species from the mountain shrub type may be found at most elevations.

Additional riparian zone shrubs include Narrowleaf cottonwood (Populus angustifolia), red osier dogwood (Cornus stolonifera), skunkbush (Rhus trilobata), river birch (Betula occidentalis) and various willows (Salix spp.). Grass species from the mesic zones may be represented (mountain shrub and higher zones) along with fescues (Festuca spp.) and miscellaneous sedges (Carex spp.). Small wet areas around springs and seeps will often support a dense growth of grasses, sedges and willows.

HYDROLOGY

Surface runoff from the Wasatch Plateau area flows either to the Price River Basin or the San Rafael River Basin. The Price River Basin, which includes about 1,800 square miles in six counties, is located primarily in Carbon and Emery Counties in East-Central Utah. The San Rafael River Basin, which includes about 2,300 square miles in three counties, is located mainly in Emery County to the south of the Price River Basin. The Price River drainage originates in the Wasatch Plateau about 12 miles west and south of Scofield

Reservoir. Downstream from the reservoir the river flows in a generally southeasterly direction. The drainage is bounded by the Book Cliffs on the northeast, the Wasatch Plateau on the west and the San Rafael Swell on the south. The San Rafael River Basin occupies part of two physiographic sections of the Colorado Plateau - The High Plateaus to the north and west and Canyonlands to the south and east (Fenneman, 1946). Principal streams in the basin are Huntington and Cottonwood creeks, which merge to form the San Rafael River, and Ferron Creek, which joins the San Rafael River within a mile of that confluence. The San Rafael River also flows in a southeasterly direction to eventually join the Green River, after traveling from its headwaters in the Wasatch Plateau.

The water quality of both the Price River and the San Rafael Rivers is good in the mountainous headwater tributaries, but deteriorates rapidly as flow traverses the Mancos Shale. The shale lithology typically has low permeability, is easily eroded and contains large quantities of soluble salts that are major contributors to poor water quality. Depending upon the duration of contact, water quality degrades downstream to where Total Dissolved Solids (TDS) levels of 4,000 milligrams per liter (mg/l) are not uncommon. The predominant ion leached from the Mancos Shale is sulfate (SO_4) with values over 1,000 mg/l common in the lower reaches of the Price River.

Ground water is present in all lithostratigraphic units within the Wasatch Plateau Coal Field. Ground water occurs under localized conditions that often form a system of "perched" aquifers and associated springs and/or seeps. Significant localized ground-water resources are associated with the North Horn Formation and Price River Formation. The U.S. Geological Survey has identified and formally designated the Star Point-Blackhawk aquifer as the only regional ground-water resource occurring in the Wasatch Plateau Coal Field (Danielson, et al., 1981 and Lines, 1984).

II. CUMULATIVE IMPACT AREA (CIA)

Figure 2 delineates the CIA for current and projected mining in the East Mountain area. The CIA encompasses approximately 68 square miles and includes East Mountain. The western and eastern CIA boundaries are designated by Huntington Creek and Cottonwood Creek, whereas the southern extent is bounded by sections 8, 9 and 10, T18S, R7E, and the northern boundary is defined by a drainage divide.

III. SCOPE OF MINING

COTTONWOOD/WILBERG, DEER CREEK, AND DES-BEE-DOVE MINES (Utah Power and Light Company)

The Cottonwood/Wilberg, Deer Creek, and Des-Bee-Dove Mines represent three adjacent and overlapping permit areas encompassing about 29,000 acres.

The federal coal leases that are designated in the East Mountain "Logical Mining Units" are as follows:

Cottonwood/Wilberg

SL-064900, U-1358, U-083066, U-040151, U-044025, U-47978, and portions of SL-070645-U-02292, U-084923, and U-084924.

Deer Creek

SL-064607-064621, SL-064900, U-1358, SL-070645, U-02292, U-084923, U-084924, U-083066, U-040151, U-044025, U-014275, U-024319, and U-47979. Future coal leases (not yet in permit area) are U-06039, U-024317, and SL-051221.

Des-Bee-Dove

U-02664, SL-050133, and SL-066116.

COTTONWOOD/WILBERG MINE

Coal mining operations have been in existence since the 1890's in the Wilberg area. Utah Power and Light Company (UP&L) acquired the Wilberg Mine in September 1977 from the Peabody Coal Company, which had acquired the lease in 1958. Mining had previously been conducted under the original owner, Cyrus Wilberg, beginning in 1945. With the UP&L acquisition, the Wilberg Mine was redesigned.

A tragic fire occurred in December of 1984. On July 1, 1985, it was decided to divide the Wilberg Coal Mine into two separate and independent coal mines; the Cottonwood and the Wilberg Coal Mines, each with a separate MSHA identification number. The mining and reclamation permit, however, was designated as ACT/015/019 for the Cottonwood/Wilberg Mine because the surface facilities were shared by each mine.

Longwall mining and limited room and pillar mining produces about 2.5 million tons from the Hiawatha and Blind Canyon seams. Mining is scheduled to cease around the year 2022.

Underground development waste, sediment from sedimentation ponds and trommel reject from the Des-Bee-Dove and Cottonwood/Wilberg Mines are disposed at the Cottonwood/Wilberg Waste Rock Storage area approximately 1 mile south of the Cottonwood/Wilberg Mine. This disposal structure utilizes a maximum of sixteen acres and is part of approved BLM-ROW U-37642.

DEER CREEK MINE

UP&L purchased the Deer Creek Mine in 1977 from Peabody Coal Company, which had acquired leases on the Deer Creek property and began operations in 1969. Coal mining operations had taken place on fee land in Deer Creek Canyon prior to 1946 when the first federal coal lease was issued in this area. Operations of the Deer Creek Mine overlap those of the Wilberg Mine, predominantly in the Blind Canyon Seam. The Deer Creek Mine surface facilities are located on a 25-acre site at the junction of Deer Creek Canyon and Elk Canyon.

The majority of the Deer Creek Mine utilizes the longwall mining method and produces about 2.5 million tons per year from the Hiawatha and Blind Canyon seams. All underground operations are scheduled to cease around the year 2032.

DES-BEE-DOVE MINE

The Des-Bee-Dove Mine complex (the Deseret, Beehive and Little Dove Mines) was acquired by UP&L in 1972 from the Deseret Coal Company, a Mormon Church enterprise. The Mormon Church and the Castle Valley Fuel Company mined the property from 1938 to 1947. From 1936 to 1938 the mine workings were operated by two men, Edwards and Broderick. Mining began in the canyon in 1898 as the Griffith Mine.

The Des-Bee-Dove Mine permit area contains two mineable coal seams - the Hiawatha and Blind Canyon. The mining plan consists of a series of room and pillar continuous mine sections.

The Des-Bee-Dove Mine ceased operations on February 6, 1987. UP&L is currently maintaining the site in an indefinite "temporary cessation" phase because if the coal market improves, this mine may be re-activated. Before UP&L temporarily ceased operations, the Des-Bee-Dove Mine produced 725,000 tons per year and projected that mining would end in the year 1998.

HUNTINGTON CANYON #4 (Beaver Creek Coal Company)

The Huntington Canyon #4 Mine permit area contains 1,320 acres. The underground operations utilized room and pillar mining methods in the Blind Canyon and Hiawatha coal seams in Federal Lease No. U-33454 and SL-064903. All underground mine operations ceased November 1, 1984.

Beaver Creek Coal Company reclaimed the site during the period of August 15, 1985 through September 30, 1985. Three portals and one opening were sealed, regrading and backfilling of the pad and road areas was completed, soil replaced, and reseeding done. The reclaimed site has been maintained since that time.

CRANDALL CANYON MINE (Genwal Coal Company)

Historically, mining had been conducted in Crandall Canyon from November of 1939 to September of 1955. Mining in Tract 1 by Genwal Coal Company began in 1983.

The permit area for the Crandall Canyon Mine contains approximately 158 acres in Huntington Canyon in Emery County, Utah. The current method of room and pillar mining for Federal Lease SL-062648 will be continued throughout Lease U-54762. Pillars will be removed upon abandonment of sections. Overall, an advance-retreat mining system is projected for the mine.

The reserves within the permit area are proposed for mining through 1994.

IV. STUDY AREA

GEOLOGY

The East Mountain CIA is characterized by cliffs, narrow canyons and high plateaus. Stratigraphic units outcropping within the area include, from oldest to youngest, the Mancos Shale, Star Point Sandstone, Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation, Flagstaff Limestone and Quaternary deposits. Lithologic descriptions and unit thickness are given in Figure 3.

Rocks in the study area strike northeast and dip from one to three degrees to the southeast. The four major structural features occurring on East Mountain are: (1) Deer Creek Fault; (2) Roans Canyon Fault Graben; (3) Pleasant Valley Fault; and (4) Straight Canyon Syncline. The Deer Creek Fault and Pleasant Valley Fault trend north - south, whereas Roan's Canyon Fault Graben and Straight Canyon Syncline trend northeast - southwest. Fault displacements range from several feet to approximately 170 feet.

System	Series	Formations and members	Thickness (feet)	Lithology and water-bearing characteristics
Quaternary	Holocene and Pleistocene		0-100	Alluvium and colluvium; clay, silt, sand, gravel, and boulders; yields water to springs that may cease to flow in late summer.
Tertiary	Eocene and Paleocene	Flagstaff Limestone	10-300	Light-gray, dense, cherty, lacustrine limestone with some interbedded thin gray and green-gray shale; light-red or pink calcareous siltstone at base in some places; yields water to springs in upland areas.
	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.
		Masuk Member 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 and Hydrogeologic characteristics of the East Mountain Area (Danielson, et al., 1981).

HYDROLOGIC RESOURCES

GROUND WATER

The ground-water regime within the CIA is dependent upon climatic and geologic parameters that establish systems of recharge, movement and discharge.

Snowmelt at higher elevations provides most of the ground-water recharge, particularly where permeable lithologies such as fractured or solution limestone 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.

The Star Point Sandstone and lower portion of the Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation, Flagstaff Limestone, and Quarternary deposits are potential reservoirs or conduits for ground water in the CIA. Reservoir lithologies are predominantly sandstone and limestone. Sandstone reservoirs occur as channel and overbank, lenticular and tabular deposits, whereas limestone reservoirs have developed through solution processes and fracturing. Shale, siltstone and cemented sandstone beds act as aquacludes to impede ground-water movement. The Mancos Shale is considered a regional aquaclude that delimits downward flow within the CIA. Localized aquacludes include relatively thin, impermeable lithologies occurring within the stratigraphic section above the Star Point Sandstone.

The Star Point-Blackhawk aquifer is present and represents the only identified regional ground-water resource in the study area (Danielson, et al., 1981). Ground water associated with the Price River Formation and North Horn Formation may be characterized as occurring within an extensive "perched" aquifer zone and represents a significant hydrologic resource.

Faults and fractures act as effective conduits for ground water and allow unsaturated downward flow. Springs having significant discharges (10 gpm or greater) are most commonly located in proximity to north-south and northeast-southwest trending fault or fracture zones (Figure 4). In particular, the Roans Canyon Fault Graben appears to act as a significant conduit for ground water. Drilling from the Deer Creek Mine identified two major hydrogeologic units associated with the graben. Aquifer testing indicated the horizontal flow component within the graben is towards the east and suggests discharge occurs into the Huntington Creek drainages basin.

The Straight Canyon Syncline is also thought to direct ground-water movement towards the southwest into the Cottonwood Creek drainage basin.

Data from seven boreholes located within the Cottonwood/Wilberg Mine suggest that locally ground-water, in the Star Point Sandstone, is moving towards the northeast. Other, more regional data indicate ground water moves from north to south.

Approximately 160 seeps and springs occur within the CIA. Total spring discharge exceeds 1700 gpm. Spring discharge is distributed as follows:

<u>Lithologic Unit</u>	<u>Number of Springs</u>	<u>Total Discharge</u>
Flagstaff Limestone	5	20 gpm
Undifferentiated Flagstaff Limestone/North Horn Formation	5	60 gpm
North Horn Formation	42	1045 gpm
Undifferentiated North Horn Formation/Price River Formation	6	65 gpm
Price River Formation	28	140 gpm
Castlegate Sandstone	11	35 gpm
Blackhawk Formation	49	95 gpm
Star Point Sandstone	16	260 gpm

Analysis from spring samples indicate water quality progressively decreases from the Flagstaff Limestone to the Star Point Sandstone.

Mine inflow is estimated to total 1500 gpm for the Deer Creek Mine and Cottonwood/Wilberg Mine and 100 gpm in the Crandall Canyon Mine. Mine water is discharged to the Left Fork of Grimes Wash and Miller Canyon at the Cottonwood/Wilberg Mine and to the Huntington Power Plant at the Deer Creek Mine. Mine water is not discharged at the Crandall Canyon Mine or Des-Bee-Dove Mine. No discharge occurs at the reclaimed Huntington #4 Mine.

Mine water within the CIA represents ground-water depletion from storage in the Blackhawk Formation and Star Point Sandstone and interception of flow along faults/fractures.

SURFACE WATER

The CIA has been divided into six major drainage basins representing ten sub-drainage areas. The CIA encompasses drainage to Huntington Creek and Cottonwood Creek, both draining to the San Raphael River Basin (see Figure 5).

Crandall Canyon (1)

Crandall Canyon drainage (1) includes the disturbed area associated with the Crandall Canyon Mine. The mine exists in the lower reaches of the drainage which encompasses 3741.62 acres. The average gradient of Crandall Creek is 16 percent. Crandall Creek is perennial and flows east into Huntington Creek.

Mining is centered in the lower reaches of the drainage area and involves approximately 162 acres, of which 9.7 acres is surface disturbance. All surface disturbance is treated by maintained sediment controls.

Little Bear Canyon and Mill Fork Canyon (2 and 3)

Approximately 4319 acres drain from Little Bear Canyon and Mill Fork Canyon combined. The Huntington #4 Mine encompasses approximately 1320 acres with these two canyons. Reclaimed surface disturbance involves 12.5 acres in Mill Fork Canyon. Little Bear Creek is considered ephemeral and Mill Creek is considered perennial in its lower reaches. The average gradient of Little Bear Creek is 30 percent and the average gradient for Mill Creek is 13 percent.

Huntington #4 Mine has been reclaimed for several years and will have maintained sediment controls in place through the bonding period.

UP & L's permit area encompasses 390 acres in Mill Fork Canyon.

Rilda Creek (4)

Approximately 4586.8 acres drain Rilda Canyon. Rilda Creek is perennial due to several large springs found in the middle reaches of the creek. The average gradient of Rilda Creek is 11 percent.

The permit area of Utah Power and Light Company mines encompasses areas of Rilda Canyon. Previous surface disturbance was associated with the Helco Mine and North Emery Water Users have several developed springs adjacent to the Helco Mine. Reclamation of the abandoned Helco Mine is planned for the near future. U.P. & L.'s permit area encompasses 2417 acres of Rilda Canyon drainage.

Meetinghouse Canyon and Deer Creek Canyon (5 and 6)

Approximately 4955 acres drain Meetinghouse Canyon and 3593 acres drain Deer Creek Canyon. Meetinghouse Creek is considered ephemeral and Deer Creek is considered perennial. The average gradient of Meetinghouse Creek is 12 percent and the average gradient of Deer Creek is 13 percent. Approximately 56 acres of surface disturbance associated with the Deer Creek Mine is found in the middle of Deer Creek Canyon. The surface facilities are treated by sediment controls and all coal produced at the mine is conveyed to the Huntington Power Plant found adjacent to Huntington Creek near the bottom of Deer Creek Canyon.

Meetinghouse Canyon contains 4535 acres and Deer Creek Canyon contains 3,347 acres of U.P. & L.'s permit area.

Maple Gulch and Danish Bench (7 and 8)

Approximately 6790 acres is associated with the drainage area of Maple Gulch and approximately 5960 acres is associated with the drainage area of Danish Bench. Both areas are primarily Mancos Shale flats draining away from the southern end of East Mountain and lack the confined canyons of some of the other drainages found in the CIA. Danish Bench drains to Cottonwood Creek and has an average gradient of 12.5 percent. Maple Gulch drains to Huntington Creek and has an average gradient of 17 percent. Permit areas of the U.P. & L. mines encompasses 837 acres of Maple Gulch and 250 acres of Danish Bench. Neither area contains any surface disturbance associated with mining.

Grimes Wash (9)

Approximately 8412 acres is associated with Grimes Wash drainage. The Cottonwood/Wilberg Mine is situated within Grimes Wash and represents 31 acres of surface disturbance which is treated by sediment controls. The average gradient of Grimes Wash is 14 percent. U.P. & L.'s permit area encompasses 4120 acres of the Grimes Wash drainage.

Cottonwood Creek (10)

This drainage encompasses 10,373 acres and includes all drainage to Cottonwood Creek along the western half of the CIA area. It has many small canyons and contains 12 acres of surface disturbance associated with the Cottonwood Fan Portal area of the Cottonwood/Wilberg Mine. This area is treated by sediment controls and is partially reclaimed. The portion of U.P. & L.'s permit area contained in this drainage is 5120 acres. There is also a portal in Miller Canyon which drains to Cottonwood Creek and discharges periodically due to gravity drainage from the mine.

V. POTENTIAL IMPACTS

GROUND WATER

Dewatering and subsidence related to mining have the greatest potential for impacting ground-water resources in the CIA. The impact of changes in vegetation on ground-water recharge should be minimal since mining will disturb less than 150 acres of the 44,000 acre CIA. Disturbance of phreatophytic vegetation (primarily cottonwood and some willow) is negligible.

The Cottonwood/Wilberg Mine Waste Rock Storage area is located below the coal resource on Quaternary sediment gravel that directly overlies the Masuk member of the Mancos Shale. Inasmuch as the Mancos Shale is considered a regional aquiclude, the storage facility presents a low risk for impacting ground-water resources.

Dewatering. The volume of water being discharged from mines within the CIA (1,600 gpm) approximates the amount of water that is currently being withdrawn from the ground-water system. The current and projected withdrawal values may be totalled and compared to estimates of ground-water discharge and recharge within the CIA and thereby, allow an assessment of cumulative dewatering impacts.

Approximately 38,400 acres within the CIA overlie the coal resource and represent a potential recharge area (Figure 6). Average annual precipitation is approximately 20 inches over the potential recharge area and hence, the total annual precipitation over the outcropping recharge area is 53,900 acre-feet.

Table 1A gives estimates for the total annual discharge of springs from water-bearing rock units that overlie the coal resource.

Table 1A. Precipitation and Spring Discharge Estimates for Areas Above the Coal Resource, East Mountain CIA.

<u>Lithologic Unit</u>	<u>Outcrop Area (acres)</u>	<u>Normal Annual Precipitation on Outcrop (acre-feet)</u>	<u>Total Annual Discharge of Springs (Percent of annual precipitation on outcrop)</u>
Undivided Flagstaff Limestone, North Horn Formation, Price River Formation	26,000	43,300	3%
Castlegate Sandstone	3,300	5,600	1%
Blackhawk Formation, Star Point Sandstone	9,100	5,000	3%
Total			

Discharge also occurs directly to perennial streams where channels intersect ground water within the Blackhawk Formation and Star Point Sandstone. The six perennial streams that occur within the CIA are: Crandall Creek, Mill Fork Creek, Rilda Creek, Grimes Wash Creek, Cottonwood Creek, and Huntington Creek. All of these streams intersect the lower Blackhawk Formation and Star Point Sandstone. A study conducted along Miller Creek in the adjacent Gentry Mountain area indicated streamflow substantially increased (from 8 to 115 gpm) as a result of discharge from the Blackhawk Formation and Star Point Sandstone (Cyprus-Plateau Mining Company, Star Point Mine PAP, pages 783-40). The results from the Miller Creek study suggest perennial streams that traverse the regional aquifer sustain similar ground-water discharges (or base flow recharge). Accordingly, total base flow recharge to perennial streams is estimated to be 600 gpm.

Table 1B lists estimated ground-water discharges to perennial streams and from mines.

Table 1B. Estimated Ground-Water Discharge to Perennial Streams and from Mines, East Mountain CIA.

Discharge to Perennial Streams (6 total)	<u>600</u> gpm
Discharge from Mines (3 total)	<u>1600</u> gpm
Total	<u>2200</u> gpm

Table 1C approximates the amount of ground water discharged to the atmosphere by mine ventilation systems. Psychrometric formulas were utilized to derive ventilation discharge values and extrapolated to mine elevation. Average relative humidity data from the Central Weather Station in the Manti-LaSal National Forest were also used in the psychrometric calculation.

Table 1C. Approximate Atmospheric Discharges from Active Mines, East Mountain, CIA.

<u>Mine</u>	<u>Approximate Discharge Rate (gpm)</u>
Cottonwood/Wilberg Mine	36
Deer Creek Mine	36
Crandall Canyon Mine	<u>10</u>
TOTAL	82

Total ground-water discharge within the CIA (summed from Tables 1A, 1B and 1C) is currently about 3700 gpm, where 41 percent (2100 gpm) of the total represents natural discharge to streams and springs and 59 percent (1600 gpm) results from mining activities.

Lines (1985) investigated the adjacent Trail Mountain area and indicated regional aquifer inflow to mines is derived from aquifer storage (80 percent) and aquifer discharge (20 percent). Extrapolating these percentages to the East Mountain CIA allows depletion, due to present mining activities (5200 acres mined), of regional aquifer storage and discharge to be estimated at 1280 gpm and 320 gpm, respectively. Assuming future mining encompasses 12,000 acres and will continue to encounter steady - state inflow from the regional aquifer, then depletion would increase to 2960 gpm for storage and 740 gpm for discharge.

U.P. & L. has proposed to access coal reserves for the Deer Creek Mine by driving a rock tunnel across the Roans Canyon Fault Graben. A drilling and testing program identified two water-bearing zones within the graben. The operator intends to minimize inflow by pressure grouting the water-bearing zones during development of the rock tunnel. It is not anticipated that the diversion of ground-water flow within the Roans Canyon Fault Graben will exceed a total of 100 gpm.

Future mining-induced dewatering is projected to encompass 2100 gpm and hence, the cumulative dewatering total would be approximately 3700 gpm. Following the cessation of mining, the discharge of ground water to the Left Fork of Grimes Wash, Miller Canyon, Huntington Power Plant and the atmosphere will cease and workings will begin to flood.

The impact associated with the reduction in surface flow is considered temporary. Mine flooding will conceivably recharge regional aquifer storage and re-establish the natural ground-water conduit system that was operational prior to mining. The maximum time span required for complete mine flooding may be derived by assuming the final workings (14,000 acres) will remain open (average 5 foot height) and caving will not occur. Accordingly, for workings that experience inflow (Cottonwood/Wilberg Mine, Deer Creek Mine, Crandall Canyon Mine) an upper limit of 20 years may be derived for complete mine flooding. It should be noted that complete flooding will, undoubtedly, never be achieved because the hydraulic head generated as flooding proceeds will increase until the hydraulic properties of the roof, floor and rib are exceeded and flow within the rocks initiates.

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 partially controlled by fracture conduits, readjustment or realignment in the conduit system will inevitably 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 within permeable lithologies. Subsurface flow diversion may cause the depletion of water in certain localized aquifers and potential loss of flow to springs that will be undermined. Increased flow rates along fractures would reduce ground-water residence time and potentially improve water quality.

Mining will occur beneath approximately 13 springs that have a combined flow in excess of 625 gpm. Overburden thickness averages more than 1000 feet beneath areas where springs are located. Diversion of spring flow is considered to be at overall low risk.

SURFACE WATER

The cumulative impacts associated with mining within the CIA will be summarized by individually discussing impacts associated with the Crandall Canyon Mine, Huntington #4 Mine, Deer Creek Mine, Cottonwood/Wilberg Mine and the Des-Bee-Dove Mine. Creeks and drainage areas which are referenced by (#) or discussed, are shown on Figure 5, Surface Water Drainage Map.

Cottonwood/Wilberg Mine. The Cottonwood/Wilberg Mine is located in Grimes Wash. Grimes Wash drainage quality is greatly affected by the influx of the Right Fork. The Right Fork originates in the North Horn Formation (interbedded shales, siltstones, and sandstones), which is abundant with calcareous material. As a result, the Right Fork contributes a relatively high amount of suspended solids to the Grimes Wash drainage. The greatest factor influencing the suspended solids level in the Right Fork drainage during 1988 was the sudden increase in temperature.

As reported in 1985, the TDS level increased slightly at the location below the mine. Two possible factors stated for the rise were Cottonwood/Wilberg Mine Discharge and Mancos Shale seeps. Due to the fact that no water was discharged from the mine during 1985 through 1988 (one exception in August 1986), seeps emanating from the Mancos Shale probably have the greatest influence upon the level. Periodic sampling during 1986 and early 1987 confirmed the seeps' contribution to the TDS level. The average for the four samples collected was 1,188 mg/l, representing a nearly 3.3 fold increase over the historical averages for the Right and Left Forks. (Annual Hydrologic Monitoring Report for 1988, pg. 24).

All surface facilities are treated by sediment controls and as such, there are no potential impacts from sediments generated from disturbed areas.

Waste rock generated from the Des-Bee-Dove and Cottonwood/Wilberg Coal Mines is disposed of in a series of seven inter-connected storage cells which constitute the Cottonwood/Wilberg Waste Rock Storage area (Figure 4). The waste rock storage site is located at 6,800 feet elevation; annual precipitation is approximately 14 inches, and the vegetation surrounding the waste rock storage area is the pinyon-juniper community type.

Each complete waste rock containment structure consists of over four feet of shot and crushed coal, sandstone, and mudstone rock. The expected waste rock encountered will be approximately 70 percent sandstone, 20 percent interbedded mudstone and siltstone, and 10 percent boney coal.

Roof and floor materials are sandy loam to loamy sand in nature. Analyses of roof and floor material indicate high Sodium Adsorption Ratios (SAR) (Mean=17.36, Standard Deviation=25.14), and movement of sodic materials is typically associated with hydroscopic rise and leaching processes. High SAR in the waste rock storage area should not be a concern to water quality because drainage from the storage site should be minor.

Analyses from Drill Hole EM-23C, indicates low pH (3.3, 2.9, 3.7) within the mudstones and siltstones directly below the Hiawatha Coal Seam. Additionally, roof and floor analyses indicate high pyritic/marcasite levels (%FeS₂ Mean=8.15, Standard Deviation=10.82). The colluvium and Mancos Shale which underlies the waste rock storage area is calcareous and should be sufficient to neutralize drainage or seepage from areas within the waste rock storage site, which could potentially form acid.

Although most water associated with the Cottonwood/Wilberg Waste Rock Storage Area will evaporate, some water will inevitably percolate through the storage cells and underlying colluvium deposits. Eventually seepage would contact the Mancos Shale and further degradation (increased TDS and EC) of water quality would take place. Accordingly, drainage from the waste rock storage site would have little down-gradient effect.

Deer Creek Mine. Referencing Table 1D, it is apparent that the quality of Deer Creek runoff degrades from the upper to lower sampling points. The quality of the lower point is affected by the Mancos Shale and is dominated by chloride, sulfate and sodium.

Table 1D. Deer Creek Water Quality.

		<u>Calcium</u>	<u>Chloride</u>	<u>Conductivity</u>	<u>Magnesium</u>	<u>Sodium</u>	<u>Sulfate</u>	<u>TDS</u>	<u>TSS</u>
Above	Max	82.0	176.0	1580	183.9	111.6	255.0	897	3592.0
Mine	Mean	49.5	19.2	581	37.5	27.5	63.8	335.0	124.9
Below	Max	112	420.0	2300	122.8	233.8	500.0	1544	20540.0
Mine	Mean	73	120.4	1153	67.0	114.9	215.8	684	490.9

Deer Creek sediment pond discharge has been historically within UPDES limits, but discharges high Total Dissolved Solids degrading downstream water quality.

All surface drainage facilities are designed to safely control water and sediment runoff from all disturbed areas. In addition, all surface water originating from undisturbed lands upstream of the facilities area will be controlled and diverted around the operation. Storm runoff from within the mine facilities area is collected in a system of open ditches, bermed roadways and culverts, and is discharged to Deer Creek below the facilities area.

The sediment pond is designed to detain the 10-year, 24-hour storm event. It should be noted that when the design event is exceeded (i.e. storms larger than the 10-year, 24-hour storm), sediment detention times will be reduced, leading to a slightly higher sediment load in Deer Creek.

Runoff from 25 acres of disturbed land will be temporarily detained in the Deer Creek Mine sediment pond and will be released to Deer Creek within UPDES limitations. The surface-water impact associated with the Deer Creek Mine operations will be minimal.

Reclamation of the drainage at the Deer Creek Mine will consist of removing the temporary drainage system, diversion and sedimentation pond. Permanent channels will be constructed over the fill and into a splash basin. The Utah program regulations currently require all diversions to be routed away from fill. However, the applicant's proposal has been determined to be sound engineering design and acceptable as a state-of-the-art experimental practice under UMC 785.13. All channels are designed to pass the 100-year, 24-hour runoff peak flow. The proposed surface-water reclamation plan will have negligible impact on water quantity or quality of Deer Creek and its tributaries.

Des-Bee-Dove Mine. The Des-Bee-Dove Mine complex ceased operations in February 1987 for economic reasons and is in an indefinite "temporary cessation". The mine is a dry mine and all surface drainage is treated by a sediment pond and released to an ephemeral wash. Since all surface water is treated by a maintained sediment pond, the effects of the Des-Bee-Dove Mine operations or the hydrologic balance are negligible.

Huntington #4 Mine. The major aquatic habitats within the permit area are Mill Fork and Little Bear Creek. All reclaimed mine lands are within Mill Fork Canyon. Based on benthic macroinvertebrate and aquatic habitat surveys conducted by the operator and on data provided by the Utah Division of Wildlife Resources, neither creek supports game or non-game fish and both lack sufficient flow in most years to provide spawning sites. However, these streams probably contribute some invertebrate food items and a small amount of surface flow to Huntington Creek, an important fishery in the region.

The mine is currently reclaimed and all surface structures have been removed and all disturbed areas reseeded. Sediment controls are in place (i.e. sediment ponds) and there is no anticipated impact to Mill Creek from the Huntington #4 Mine due to the lack of potential sources of impact.

Crandall Canyon Mine. Crandall Canyon Mine is located in Crandall Canyon. The U.S. Geological Survey established a gaging station at the mouth of Crandall Canyon 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 Canyon Creek occurs in the period of May through July. Assuming an average of 30 acre-feet per month for the period when records were missing, the average annual flow for the six year period of data was 2740 acre-feet.

Surface water quality data collected from Crandall Canyon Creek by Genwal Coal Company for the Tract 1 Lease from 1985 indicate that the dominant ions in Crandall Canyon 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 occurring during the high flow season. Total suspended solids concentrations in Crandall Canyon 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.

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. Low suspended sediment values are associated with natural climactic 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.).

VI. SUMMARY

Mine operations within the CIA currently intercept regional aquifer flow at an approximate rate of 1,600 gpm. Of this total, approximately 1586 gpm are consumptively lost to mine ventilation (86 gpm) and cooling/evaporation at a power plant (1,500 gpm). The remaining 14 gpm are discharged, without interbasin transfer of water to streams. Mine water discharge meet required effluent limitations.

Future mining operations are designed to avoid interception of fault conduit flow and accordingly, inflow from the regional aquifer is estimated to increase from 1,600 gpm to 3700 gpm. Approximately 80 percent of the flow will be derived from storage and 20 percent from discharge. Consumptive use is not anticipated to increase. Mine water discharge (1500 gpm) and ventilation losses (86 gpm) will be discontinued upon cessation of mining. Concomitantly, flooding of abandoned workings will initiate. An upper limit of 20 years has been estimated for complete flooding of workings and re-establishment of the premining ground-water system.

Diversion of spring flow is considered to be at overall low risk.

Sediment control measures have been and will be designed and implemented to reduce and stabilize contamination of surface waters.

Following cessation of mining, waste rock storage areas will be adequately covered with topsoil and all disturbed areas will be stabilized and revegetated to prevent surface water contamination.

The designs proposed for all anticipated mining operations within the CIA are herein determined to be consistent with preventing damage to the hydrologic balance outside the proposed mine plan areas.

AT99/1-24

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State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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Governor

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Executive Director

Dianne R. Nielson, Ph.D.
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355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

April 26, 1990

TO: Pam Grubaugh-Littig
FROM: Joseph C. Helfrich *JCH*
RE: Compliance Review for Section 510(c) Finding, Beaver Creek Coal Company, Huntington #4, INA/015/004, Emery County, Utah

As of the writing of this letter, there are no NOV's or CO's which are not corrected or in the process of being corrected. Any NOV's or CO's that are outstanding are in the process of administrative or judicial review. There are no finalized Civil Penalties which are outstanding and overdue in the name of Beaver Creek Coal Company.

Finally, they do not have a demonstrated pattern of willful violations, nor have they been subject to any bond forfeitures for any operation in the state of Utah.

jb
WMN/1

APPLICANT VIOLATOR SYSTEM

04/26/90

RECOMMENDATION INFORMATION

APPLICATION: INA015004

STATE: UT

RECOMMENDATIONS

=====

PARKER CASE:

SYSTEM: ISSUE

DATE: 890802

REASON:

FIELD OFFICE:

DATE:

REASON:

REASON:

OSMRE: ISSUE

DATE: 890816

REASON:

REASON:

PERMIT STATUS:

MESSAGE:

CONTINUE (N)

esc-chr: ^X help: ^X? port:1 speed: 1200 parity:mark echo:rem VT102

*Phone conversation w/ Mary Nichol (osm w.d.c.)
: new recommendation of 8/16/89 will be adequate for 4/30/90
permitting actions. Jch 4/26/90*

Message 610-517
Subj: TO: JOE HELFRICH, UT SRA

UT8.15

AVS CLEARINGHOUSE RECOMMENDATION

Pending Application Number INAO15004, BEAVER CREEK COAL CO. has been researched, and the AVS Clearinghouse recommendation is ISSUE.

cc: Gary Fritz, Albuquerque Field Office

[PC ID 20:DOI370025:09466]

152E for 152G22 13:15 MDT 15-Aug-89 Message 610-517 [1]
* RECEIPT notice pending *

Receipt of Message 610-517 acknowledged to 152E on 14:58 MDT 17-Aug-89
Action?:
[Done]

End for Attention, Home to Switch : Capture Off : Numeric

AFFIDAVIT OF PUBLICATION

STATE OF UTAH }
County of Carbon, } ss.

I, Dan Stockburger, on oath, say that I am the General Manager of the The Sun-Advocate, a weekly newspaper of general circulation, published at Price, State and County aforesaid, and that a certain notice, a true copy of which is hereto attached, was published in the full issue of such newspaper for Four (4) consecutive issues, and that the first publication was on the

20th day of February, 1990

and that the last publication of such notice was in the issue of such newspaper dated the

13th day of March, 1990

Dan Stockburger

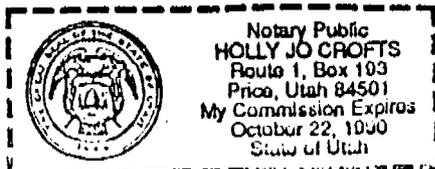
Subscribed and sworn to before me this

13th day of March, 1990

Holly Jo Crofts
Notary Public.

My Commission expires October 22, 1990

Filing fee, \$ 88.80



PUBLIC NOTICE FOR PERMIT RENEWAL

Beaver Creek Coal Company; P.O. Box 1378, 1109 South Carbon Ave., Price, Utah 84501, a wholly owned subsidiary of Atlantic Richfield Company, has filed with the Utah Division of Oil, Gas & Mining, an application for renewal of its Mining and Reclamation Plan Permit for its Huntington Canyon No. 4 Mine. The Huntington Canyon No. 4 Mine was located in Mill Fork Canyon, approximately 10 road miles northwest of Huntington, Utah. The permit area is described as follows:

Township 16 South, Range 7 East, Salt Lake Base Meridian; All of Section 16, SW $\frac{1}{4}$ Section 8, S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 8, S $\frac{1}{4}$ SW $\frac{1}{4}$ Section 9, SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 9, E $\frac{1}{2}$ Section 17.

The Huntington Canyon No. 4 Mine was permanently reclaimed in September 1985, and was granted Phase I bond release in November 1986.

The application was filed, and this notice is being published to comply with the Surface Mining Control and Reclamation Act of 1977 and State and Federal regulations promulgated pursuant to said Act.

The Huntington Canyon No. 4 Mine is located on "Rilda Canyon, Utah", U.S. Geological Survey 7.5-minute quadrangle map.

A copy of the application is available for public inspection at the following address:

Recorder's Office
Emery County Courthouse
Castle Dale, Utah 84513.
Mining and Reclamation Plan
Huntington Canyon No. 4 Mine Permit Application.

Written comments, objections or requests for informal conferences on the application may be submitted to: State of Utah Dept. of Natural Resources, Division of Oil, Gas & Mining, 355 West North Temple, #3 Triad Center, Suite 350, Salt Lake City, Utah 84180-1203.

Published in the Sun Advocate February 20, 27, March 6 and 13, 1990.

AFFIDAVIT OF PUBLICATION

STATE OF UTAH }
County of Emery, } ss.

I, Dan Stockburger, on oath, say that I am the General Manager of the The Emery County Progress, a weekly newspaper of general circulation, published at Castle Dale, State and County aforesaid, and that a certain notice, a true copy of which is hereto attached, was published in the full issue of such newspaper for.... Four (4).....con-

secutive issues, and that the first publication was on the
..... 20th day of February, 19..... 90

and that the last publication of such notice was in the issue of
such newspaper dated the

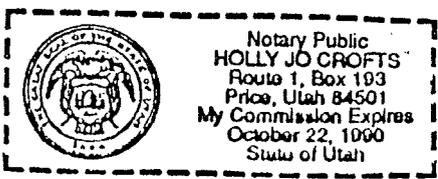
..... 13th day of March, 19..... 90
Dan Stockburger

Subscribed and sworn to before me this
..... 13th day of March, 19..... 90

Holly Jo Crofts
Notary Public.

My Commission expires October 22, 1990
Residing at Price, Utah

Publication fee, \$ 88.80



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