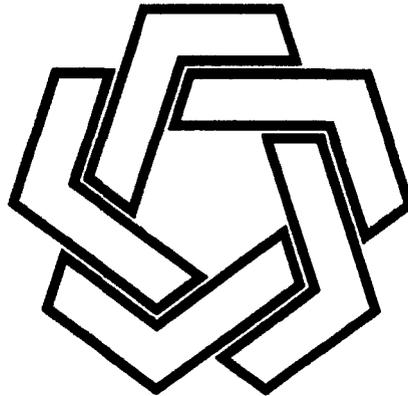


STATE DECISION PACKAGE

**Cottonwood/Wilberg Mine
Utah Power & Light Company**

FIVE-YEAR RENEWAL



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

JULY 6, 1989

UTAH DIVISION OF OIL, GAS AND MINING
STATE DECISION DOCUMENT AND
TECHNICAL ANALYSIS
FIVE-YEAR RENEWAL

COTTONWOOD/WILBERG MINE
ACT/015/019
Utah Power and Light Company
Emery County, Utah
July 6, 1989

CONTENTS

- * Administrative Overview
- * Location Map
- * Permitting Chronology
- * Mine Plan Information Form
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- * Letters of Concurrence
- * Affidavits of Publication

AT94/2

**ADMINISTRATIVE OVERVIEW
FIVE-YEAR PERMIT RENEWAL
COTTONWOOD/WILBERG MINE
ACT/015/019**

**UTAH POWER AND LIGHT COMPANY
July 6, 1989**

Background

The Cottonwood/Wilberg Mine is located approximately eight miles northwest of Orangeville, Utah on the east side of the Wasatch Plateau Coal Field. The permit area encompasses 11,508 acres comprised of Federal coal leases and privately owned holdings.

The Cottonwood/Wilberg Mine was in operation prior to the enactment of SMCRA and the subsequent Utah Code Annotated (UCA) 40-10-1 et. seq.. A permanent program permit was issued to Utah Power and Light Company on July 6, 1984.

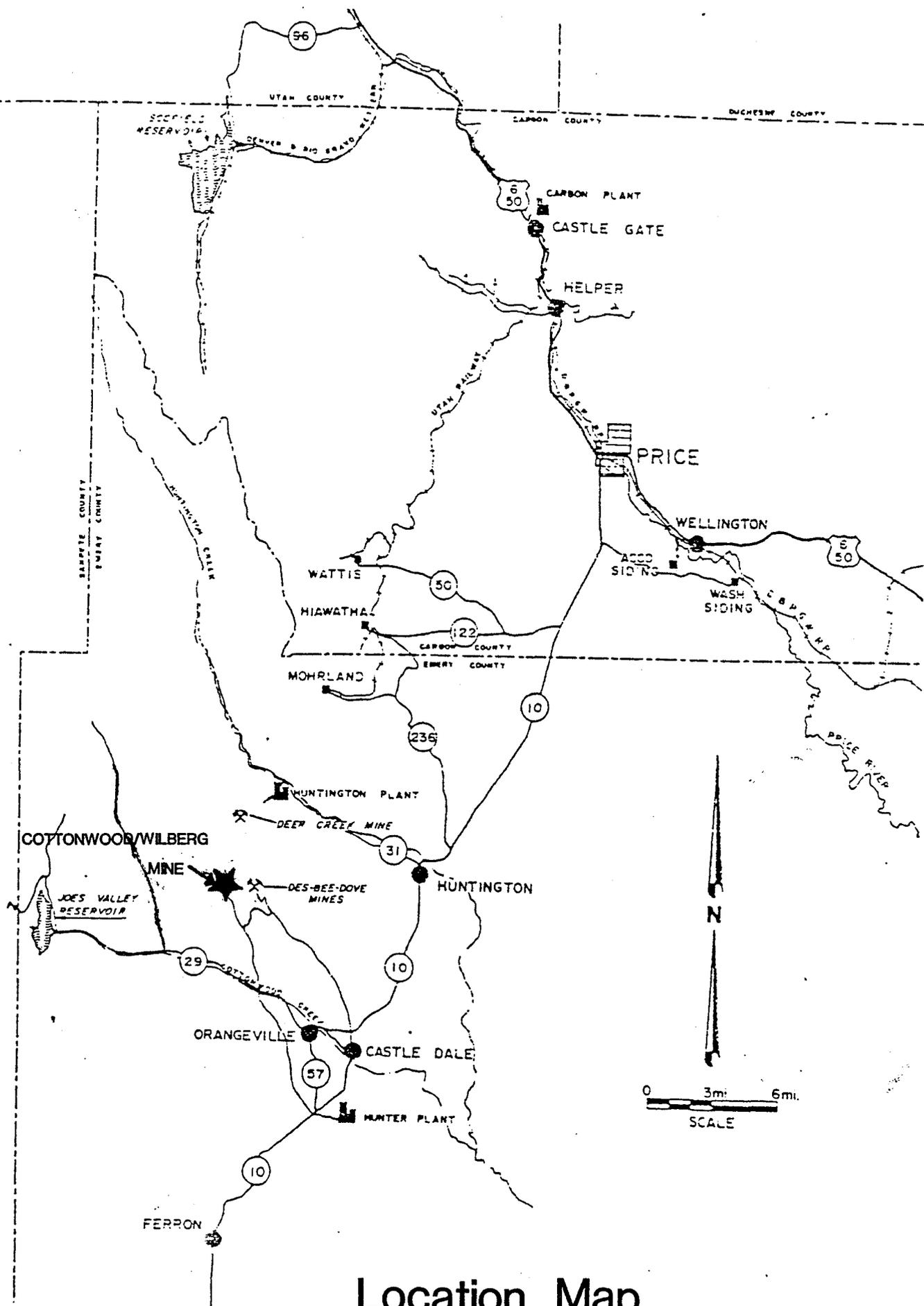
The applicant published notice for the five year permit renewal for four consecutive weeks ending on May 24, 1989. No comments were received.

Permit Changes

During the previous permit terms numerous permit changes were approved. Changes in text and illustrations that received approval have been incorporated into the Permit Application Package for the five year permit renewal.

Recommendation for Approval

Approval for the five-year permit renewal is recommended, based on a review of the Permit Application Package updated through July 5, 1989, 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 July 6, 1994.



Location Map
Cottonwood/ Wilberg Mine

**CHRONOLOGY
UTAH POWER AND LIGHT COMPANY
COTTONWOOD/WILBERG MINE
ACT/015/019**

March 3, 1989 Utah Power and Light Company (UP&L) submits updated maps and text, initiating 5-year permit renewal process.

April 3, 1989 Division notifies state and federal agencies of permit renewal. Provides copies of updated text and maps.

April 7, 1989 Division completes Initial Completeness Review (ICR) and provides comment on preliminary technical deficiencies.

April 21, 1989 UP&L submits materials addressing the ICR.

April 24, 1989 Division issues Determination of Completeness.

UP&L initiates public notice for four consecutive weeks.

June 5, 13, 19, 22, UP&L submits materials addressing technical
28 and 30, 1989 deficiencies.

July 6, 1989 Public comment period concludes with no adverse comments received. Division makes necessary findings. Permit issued.

MINE PLAN INFORMATION

Mine Name Cottonwood/Wilberg Mine State ID: ACT/015/019
 Operator Utah Power and Light Company County: Emery
 Controlled By Utah Power and Light Company
 Contact Person(s) David Smaldone Position: Director
Permitting & Compliance
 Telephone: (801) 220-4227

New/Existing Existing Mining Method Longwall and Room & Pillar

BLM - Surface Leases U-37641 and U-37642
 Forest Service Special Use Area UP&L - 2307
 BLM-Coal Lease Nos. SL-064900, U-1358, U083066, U-040151, U-044025,
U-47978 and portions of SL-070645 and U-02292, U-084923 and U-084924
 Legal Description(s) (see Attachment A)
 Other Private Leases Coal and Surface - Estate of
Malcolm McKinnon and Cooperative Security Corporation (Attachment
A)
 Legal Descriptions _____

Ownership Data: For _____

Surface Resources (acres)	Existing Permit Area	Proposed Permit Area	Total Life of Mine Area
Federal	_____	_____	<u>10,978</u>
State	_____	_____	_____
Private	_____	_____	_____
Other	_____	_____	<u>530</u>
TOTAL	_____	_____	<u>11,508</u>

Coal Ownership (Acres)

Federal	_____	_____	<u>10,919</u>
State	_____	_____	_____
Private	_____	_____	_____
Other	_____	_____	<u>530</u>
TOTAL	_____	_____	<u>11,449</u>

	<u>*Total Reserves</u>	<u>Total Recoverable Reserves</u>
<u>Coal Resource Data</u>		
Federal	<u>88 x 10⁶ Tons</u>	<u>53 x 10⁶ Tons</u>
State		
Private	<u>5 x 10⁶ Tons</u>	<u>3 x 10⁶ Tons</u>
Other		
TOTAL	<u>93 x 10⁶ Tons</u>	<u>56 x 10⁶ Tons</u>

Recoverable Reserve Data

	<u>Name</u>	<u>Thickness</u>	<u>Depth</u>
Seam	<u>Blind Canyon</u>	<u>5' - 16'</u>	<u>about 1700'</u>
Seam	<u>Cottonwood</u>	<u>Unmineable</u>	
Seam	<u>Hiawatha</u>	<u>5' - 16'</u>	<u>about 1800'</u>
Seam			
Seam			

Mine Life 30 + years
 Average Annual Production 2.5 x 10⁶ Tons Percent Recovery 60%
 Date Projected Annual Rate Reached 1983
 Date Production Begins Operating Date Production Ends 2022
 Reserves Recoverable by: (1) Surface Mining 0
 (2) Underground Mining 56.0 x 10⁶ Tons
 Reserves Lost Through Management Decision _____
 Coal Market Hunter Power Plant

<u>Modifications That Have Been Approved:</u>	<u>Date</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

COTTONWOOD/WILBERG MINE
LEGAL DESCRIPTIONS
ACT/015/019

Utah Power and Light Company
Emery County, Utah

LEASE NO. SL-064900

Section 22 SE1/4 SW1/4, SW1/4 SE1/4
NE1/4 SW1/4, NW1/4 SE1/4

Township 17 South, Range 7 East

LEASE NO. U-1358

Section 22 S1/2 NW1/4, W1/2 SW1/4,
E1/2 SE1/4

Section 27 E1/2 NE1/4

Township 17 South, Range 7 East

LEASE NO. SL-070645, U-02292

Section 4 SW1/4 SE1/4, S1/2 SW1/4
Section 5 SE1/4 SW1/4, S1/2 SE1/4
Section 8 E1/2, E1/2 W1/2
Section 9 All
Section 10 W1/2
Section 15 N1/2
Section 16 N1/2
Section 17 NE1/4, E1/2 NW1/4

Township 17 South, Range 7 East

LEASE NO. U-084923

Section 4 Lots 2, 3, 4, 5, 6, 7, 10,
11, 12, NW1/4 SE1/4, N1/2 SW1/4
Section 5 Lots 1 through 12, N1/2 S1/2,
SW1/4 SW1/4
Section 6 Lots 1 through 11, SE1/4
Section 7 Lots 1 through 4, E1/2
Section 8 W1/2 W1/2
Section 17 W1/2 NW1/4
Section 18 Lot 1 and 2, N1/2

Township 17 South, Range 7 East

Page 2
Attachment A (Continued)
Mine Plan Information
ACT/015/019
June, 1989

LEASE NO. U-084924

Section 1	Lots 1, 2, 3, S1/2 NE1/4 SE1/4 NW1/4, E1/2 SW1/4, SE1/4
Section 12	E1/2, E1/2 W1/2
Section 13	NE1/4, E1/2 NW1/4

Township 17 South, Range 6 East

LEASE NO. U-083066

Section 13	E1/2 SW1/4, SE1/4
Section 24	E1/2 W1/2, E1/2
Section 25	N1/2 NE1/4

Township 17 South, Range 6 East

Section 17	SW1/4, W1/2 SE1/4
Section 18	Lots 3 and 4, SE1/4
Section 19	Lots 1, 2, 3, 4, E1/2
Section 20	W1/2, W1/2 E1/2
Section 29	NW1/4 NE1/4, N1/2 NW1/4
Section 30	Lots 1, 2, 3, N1/2 NE1/4, SW1/4 NE1/4, NW1/4 SE1/4

Township 17 South, Range 7 East

LEASE NO. 040151

Section 15	SW14
Section 16	S1/2
Section 17	E1/2 SE1/4
Section 20	E1/2 E1/2
Section 21	All
Section 22	N1/2 NW1/4
Section 27	N1/2 NW1/4
Section 28	N1/2 N1/2
Section 29	NE1/4 NE1/4

Township 17 South, Range 7 East

Page 3
Attachment A (Continued)
Mine Plan Information
ACT/015/019
June, 1989

LEASE NO. U-044025

Section 27 NW1/4 NE1/4

Township 17 South, Range 7 East

COAL LEASE U-47978

Section 27 S1/2 NW1/4, N1/2 SW1/4
Section 28 S1/2 N1/2, S1/2
Section 29 S1/2 N1/2, S1/2
Section 30 Lot 4, SE1/4 NE1/4
 NE1/4 SE1/4, S1/2 SE1/4
Section 31 Lot 1, E1/2
Section 32 All
Section 33 N1/2, SW1/4, W1/2 SE1/4
Section 34 NW1/4 NW1/4, S1/2 NW1/4

Township 17 South, Range 7 East

Section 4 Lots 2 through 4
Section 5 Lots 1 through 4
 S1/2 NW1/4

Township 18 South, Range 7 East

Surface Rights and Coal Leased by Estate of Malcolm McKinnon

Section 10 SE1/4
Section 14 W1/2 NW1/4

Township 17 South, Range 7 East

Surface Rights and Coal Leased by Cooperative Security Corporation

Section 15 SE1/4
Section 22 NE1/4

Township 17 South, Range 7 East

Page 4
Attachment A (Continued)
Mine Plan Information
ACT/015/019
June, 1989

Surface Rights and Coal Owned by Utah Power and Light Company

Section 14 SW1/4 (West of the Deer Creek Fault)

Township 17 South, Range 7 East

Beginning at the SE corner of NE1/4 SE1/4
Section 25, T17S, R6E, SLM, thence N 160 rods, W 116 rods to center
line of Cottonwood Creek; thence Southerly along center line of said
creek to a point 84 rods West of the beginning; thence East 84 rods
to the beginning.

AT94/21-24

FINDINGS

**Utah Power and Light Company
Cottonwood/Wilberg Mine
ACT/015/019
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 proposes 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, can be feasibly 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 Operation and Reclamation Plan proposed under the application has 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 East Mountain Cumulative Hydrologic Impact Analysis [CHIA].)
4. The proposed lands to be 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);

Findings

- 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]). (See attached letter from State Historic Preservation Officer [SHPO] dated April 27, 1989.)
 6. The applicant has the legal right to enter and complete mining and reclamation activities in the permit area through BLM rights of way (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; Utah Power & Light 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 (Attachment A) with a demonstrated pattern of wilfull 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, re-verified July 6, 1989}).
 8. Mining and reclamation operations to be performed under the permit will not be inconsistent with other operations anticipated to be performed in areas adjacent to the proposed permit area (UMC 786.19[j]).
 9. A detailed analysis of the proposed bond has been made. The bond estimate is \$1,294,522.00. The Division has made appropriate adjustments to reflect costs which would be incurred by the state, if it was required to contract the final reclamation activities for the mine site. The bond was posted on June 15, 1984, and made payable to OSMRE and the Division of Oil, Gas and Mining (UMC 786.19[k]).
 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.)

Findings

11. The proposed postmining land-use of the permit area has been approved by the regulatory authority (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 compiled with (UMC 786.11-.15).
15. The applicant proposes to use existing structures in connection with the proposed underground coal mining activities. These structures meet the performance standards of the Act and subchapter K and pose no significant harm to the environment or public health or safety (UMC 786.21) (see TA Section UMC 817.181).

Richard V. Smith

Permit Supervisor

Lance P. Brafto

Associate Director, Mining

David R. Nielson

Director

ATTACHMENT A

IDENTIFICATION OF INTERESTS

UTAH POWER AND LIGHT COMPANY

According to information supplied by Utah Power and Light Company, all assets of Utah Power and Light Company are owned by PacifiCorp, Oregon. PacifiCorp is the majority shareholder in NERCO, Inc., which includes five coal companies with seven permits. The following lists the permit numbers, companies and attendant issuing regulatory authority for coal mines controlled by NERCO, Inc.

<u>PERMIT NUMBER</u>	<u>COMPANY</u>	<u>REGULATORY AUTHORITY</u>
291T2	Glenrock Coal Company	Wyoming Department of Environmental Quality
TFN24/90	Antelope Coal Company	Wyoming Department of Environmental Quality
PT33822	Bridger Coal Company	Wyoming Department of Environmental Quality
P3227	NERCO Eastern Coal Company	Alabama Surface Mining Commission
P3501	NERCO Eastern Coal Company	Alabama Surface Mining Commission
MT 79012R	Spring Creek Coal Company	Montana Department of State Lands
819P	NERCO Eastern Coal Company	Office of Surface Mining, Tennessee

BT40/39

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/015/019, is issued for the state of Utah by the Utah Division of Oil, Gas and Mining (DOGM) to:

Utah Power and Light Company
P. O. Box 899
Salt Lake City, Utah 84110
(801) 220-4227

for the Cottonwood/Wilberg Mine. Utah Power and Light Company (UP&L) is the lessee of federal coal leases SL-064900, U-1358, SL-070645-U-02292, U-084923, U-084924, U-083066, U-040151, U-044025, U-47978, and the owner/lessee of certain fee-owned parcels. A performance bond is filed with the DOGM in the amount of \$1,294,522.00, 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 underground coal mining activities on the following described lands (as shown on the map appended as Attachment B) within the permit area at the Cottonwood/Wilberg Mine, situated in the state of Utah, Emery County, and located:

Federal

Township 17 South, Range 6 East, SLM

Section 1: SE1/4, E1/2 SW1/4, S1/2 SE1/4 NE1/4,
SE1/4 SW1/4 NE1/4;
Section 12: E1/2, E1/2 W1/2;
Section 13: E1/2, E1/2 W1/2;
Section 24: E1/2, E1/2 W1/2;
Section 25: N1/2 NE1/4, E1/2 NW1/4 SE1/4;

Township 17 South, Range 7 East, SLM

Section 6: Lots 9, 10, 11; W1/2 W1/2 SW1/4;
Section 7: Lots 1, 2, 3, 4; W1/2 NW1/4 NW1/4; SW1/4 NW1/4;
S1/2;
Section 8: S1/2 SW1/4, S1/2 NW1/4 SW1/4, SW1/4 NE1/4
SW1/4, S1/2 S1/2 SE1/4, N1/2 SW1/4 SE1/4;
Section 9: S1/2 S1/2 SW1/4, SE1/4 SE1/4, S1/2 SW1/4 SE1/4,
NE1/4 SW1/4 SE1/4, SE1/4 NE1/4 SE1/4;
Section 10: S1/2 SW1/4, S1/2 N1/2 SW1/4;
Section 15: N1/2, SW1/4;
Section 16: All
Section 17: All
Section 18: All
Section 19: All
Section 20: All
Section 21: All
Section 22: NW1/4, S1/2;
Section 27: NW1/4, N1/2 SW1/4, NE1/4;
Section 28: All
Section 29: All
Section 30: All
Section 31: Lot 1, E1/2, E1/2 W1/2;
Section 32: All
Section 33: N1/2, SW1/4, W1/2 SE1/4;
Section 34: S1/2 NW1/4, NW1/4 NW1/4, E1/2 SE1/4 NW1/4
NE1/4, S1/2 SE1/4 NE1/4, E1/2 NW1/4 NE1/4
SE1/4, NE1/4 NE1/4 SE1/4, N1/2 SE1/4 NE1/4
SE1/4, E1/2 NE1/4 SE1/4, NW1/4 NE1/4 SE1/4;
Section 35: NW1/4 SW1/4 SW1/4, W1/2 NE1/4 SW1/4 SW1/4,
SW1/4 NW1/4 SW1/4, W1/2 NW1/4 NW1/4 SW1/4;

Township 18 South, Range 7 East, SLM

Section 4: NW1/4 NE1/4, N1/2 NW1/4;
Section 5: N1/2 NE1/4, NW1/4;

Fee

Township 17 South, Range 6 East, SLM

Section 25: NE1/4 SE1/4, SE1/4 NE1/4, E1/2 SW1/4 NE1/4;

Township 17 South, Range 7 East, SLM

Section 10: SW1/4 SE1/4, S1/2 SE1/4 SE1/4;
Section 11: S1/2 SW1/4 SW1/4;
Section 14: W1/2 W1/2 NW1/4, W1/2 E1/2 W1/2 NW1/4, W1/2
W1/2 W1/2 SW1/4;
Section 15: SE1/4;
Section 22: NE1/4;

Beginning at the SE corner of NE1/4 SE1/4 Section 25, Township 17 South, Range 6 East, SLM, thence North 160 rods, West 116 rods to center line of Cottonwood Creek; thence Southerly along center line of said creek to a point 84 rods West of the beginning; thence East 84 rods to the beginning.

This legal description is for the permit area (as shown on Attachment B) of the Cottonwood/Wilberg Mine and Waste Rock Disposal Area. The permittee is authorized to conduct underground coal mining activities and related surface activities 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 July 6, 1989 and expires on July 6, 1994.
- 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 underground coal mining activities only on those lands specifically designated as within the permit area on the maps submitted in the mining and 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 such noncompliance, any person whose health and safety is in imminent danger due to the noncompliance.
- Sec. 8 DISPOSAL OF POLLUTANTS - The permittee shall dispose 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 - In addition to the general obligations and/or requirements set out in the leases, the federal mining plan approval, and this permit, the permittee shall comply with the special conditions appended hereto as Attachment A.

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: Donne R. Nielson
Date: 7/6/89

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

C. Brett [Signature]
Authorized Representative of
the Permittee
Date: 7-25-89

APPROVED AS TO FORM:

By: Barbara W. Roberts
Assistant Attorney General
Date: July 5, 1989

Attachment A

UTAH DIVISION OF OIL, GAS AND MINING
COTTONWOOD/WILBERG MINE
STIPULATIONS
ACT/015/019
July 6, 1989

Stipulation UMC 817.24-(1)-(HS)

1. Within 30 days of permit approval, the applicant must submit an adequate topsoil redistribution and final revegetation plan for the Cottonwood Fan Portal area.

Stipulation UMC 871.41-(1)-(DW)

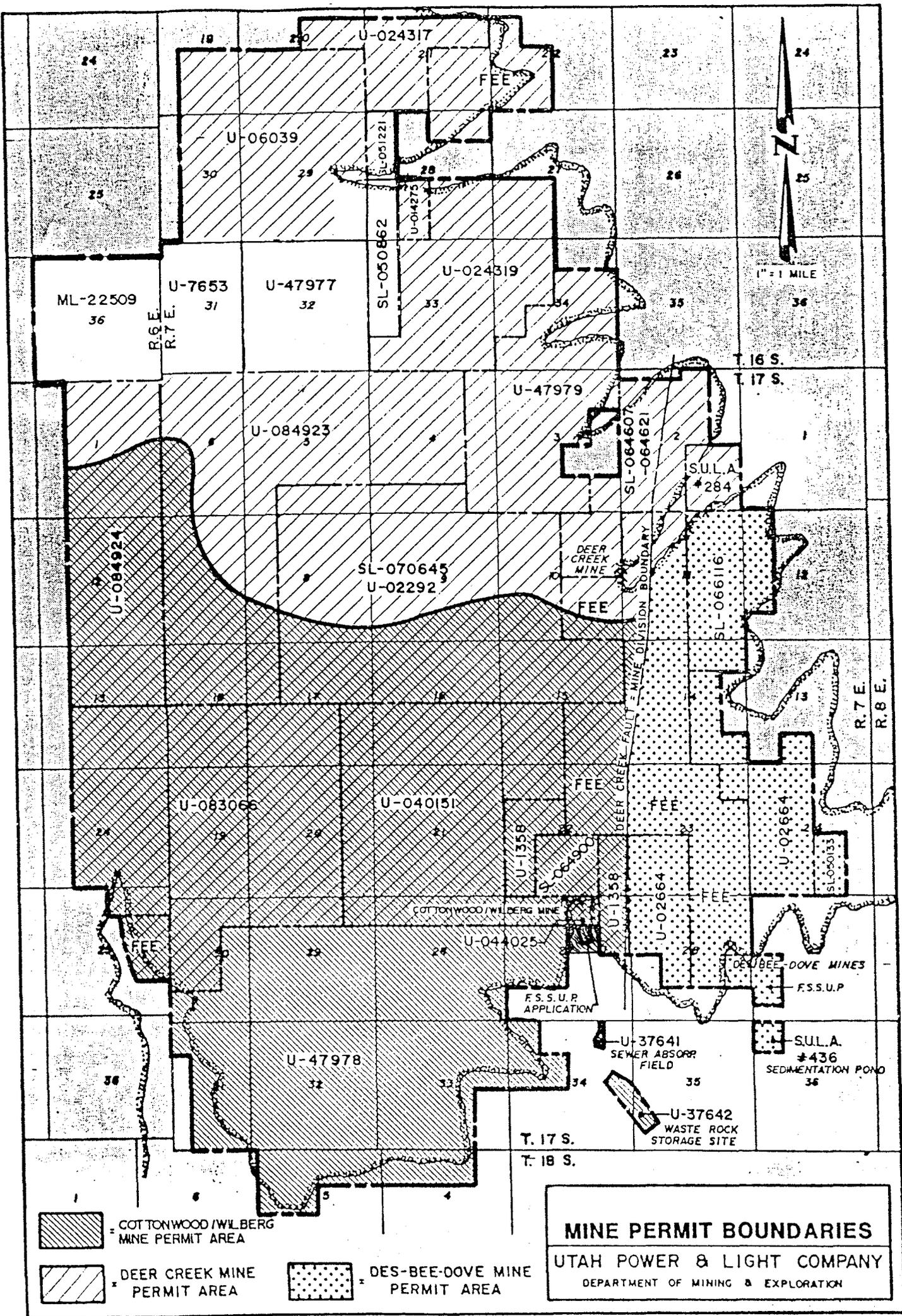
1. Within 30 days of permit approval, the applicant must submit a complete reclamation plan for the Cottonwood Fan Portal area. This plan must include calculations and designs for channel or drainage restoration according to the 100-year 24-hour event, if appropriate.

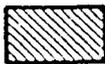
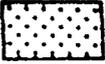
Stipulation UMC 817.48-(1)-(HS)

1. Within 30 days of permit approval, the applicant must submit: (1) Previous waste rock data collected from the completed waste rock cells (1 through 6); (2) Laboratory analysis of previously collected roof and floor samples, and sample location map; (3) A commitment to annually monitor roof, floor, and midseam material for its potential acid- and/or toxic-forming characteristics according to Division's Guidelines for the Management of Topsoil and Overburden. Top soil and Overburden (i.e. Water soluble Selenium and Boron, Clay Content, pH, Acid-Base Potential, SAR, E.C.); (4) a commitment to properly bury or otherwise treat all acid-and toxic-forming materials within 30 days of initial exposure at the mine site.

Stipulation UMC 817.52-(1)-(DW)

1. Within 30 days of permit approval, the applicant must submit a reclamation water monitoring plan for the Cottonwood Fan Portal area.



-  = COTTONWOOD/WILBERG MINE PERMIT AREA
-  = DEER CREEK MINE PERMIT AREA
-  = DES-BEE-OOVE MINE PERMIT AREA

MINE PERMIT BOUNDARIES
UTAH POWER & LIGHT COMPANY
 DEPARTMENT OF MINING & EXPLORATION

UTAH DIVISION OF OIL, GAS AND MINING
TECHNICAL ANALYSIS
COTTONWOOD/WILBERG MINE
ACT/015/019

Utah Power and Light Company
Emery County, Utah
July 6, 1989

UMC 785.19 Alluvial Valley Floors-(RVS)

Existing Environment and applicant's Proposal

Unconsolidated streamlaid deposits do not occur within, or in close proximity to, the permit area. Quarternary alluvium (Qal) has not been identified along Grimes Wash (Doelling, 1972). Technical staff inspection of the mine site and adjacent area have not identified the existence of flood irrigation (or its historical use) or the capability of stream valleys to be flood irrigated or subirrigated.

Compliance

Sufficient information about alluvial streamlaid deposits and irrigation are available to determine, as required by UMC 785.19(c)(2), that no alluvial valley floors exist with or in close proximity to the proposed permit area.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.11 Signs & Markers-(WAW)

Existing Environment & Applicant's Proposal

The applicant's proposal for signs and markers commits to install and maintain each particular sign or marker during the conduct of all activities to which they pertain or until bond release (Page 3-20). All signs will be clearly legible and of uniform design.

Compliance

The applicant commits to post and maintain mine signs as required.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.13-.15 Casing and Sealing of Exposed Underground Openings-(WAW)

Existing Environment and Applicant's Proposal

Boreholes

From 1976 to 1988, the applicant drilled approximately 118 surface exploration holes on East Mountain (page 4-39 and Map 2-1). The East Mountain property is contiguous to the Cottonwood/Wilberg, Deer Creek, and Des-Bee-Dove coal mines. The applicant has committed to reclaim all surface drilled exploration holes according to the USGS published Drill Hole Plugging Procedure.

Entries

The applicant identifies existing and proposed access portals and ventilation breakouts (pages 3-6, 3-7, 3-4, 4-1 and Maps 3-1 and 3-16). Three portals at the Left Fork of Grimes Wash remain sealed due to the mine fire in December, 1984; one entry at the Wilberg Fan Portal was also sealed at a later date. A total of 15 remaining openings are depicted on Map 3-16 excluding the mine office facility area.

Upon completion, ventilation entries (breakouts) will be fenced with chain link to prevent entry and warning signs will be posted (page 3-6).

The applicant commits to sealing all mine entries upon completion of mining activities (pages 4-1, and 4-2, Figure I). Seals will be constructed of concrete blocks, double wall thickness, and backfilled with 25 feet (minimum) of noncombustible material. No drains or special hydrological containment seals are proposed except for the Cottonwood Fan Portal area drainage. Three portals, Channel Canyon, Miller Canyon, and Cottonwood Mine belt portal will be sealed from within the mine, the remaining portals will be sealed prior to backfilling and grading.

Compliance

As of fall 1988, all surface exploration drill holes on East Mountain have been reclaimed and permanently sealed. The applicant's plans for permanently sealing entries are designed to prevent access and keep acid or other toxic drainage from entering ground or surface waters.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.22 Topsoil: Removal-(HS)

Existing Environmental Applicant's Proposal

Topsoil was not salvaged from the disturbed area associated with the Wilberg Mine (page 2-143). Dr. A. L. Southard concluded (Soils Report, pages 2-143 through 2-148) "Basically no topsoil (Horizon-A) exists in sufficient quantities to warrant stockpiling" (page 2-143).

The applicant proposes to use substitute topsoil as a plant growth medium for reclamation (page 4-18.1). Existing material shown on Map 2-18 (upper fill, parking lot fill, sediment pond fill, spoil bank) if demonstrated to be suitable (pages 4-9.8 through 4-10), will be utilized for reclamation. Revegetation test plots will be constructed to determine the suitability of the fill material as a plant growth medium for final reclamation. Test plot design and success standards are given on pages 4-17 to 4-19.

Chemical and physical analyses and soil mapping unit descriptions of the Waste Rock Storage area are located on pages 2-152 through 2-154. The top 12 inches of soil material was separately removed and segregated prior to development of each waste rock cell (Appendix VII, page 4 and 5). Removed "topsoil" has been temporarily stored in the berms that will be used in cell reclamation.

Topsoil was separately removed and stockpiled from the Cottonwood Fan Portal area (page 3-24). Detailed analyses of the portal area soils are presented on pages 2-154 through 2-158 and page 4-28.

Compliance

Topsoil was not removed from the disturbed area associated with the Cottonwood/Wilberg Mine area. The Great Group classification (Soil Taxonomy, USDA/SCS) of the disturbed soil was Ustorthent. These soils typically lack horizonation within the first meter of the surface and have a shallow lithic contact with little biological activity.

The applicant proposes to use existing fill material as a plant growth medium for final reclamation. Preliminary data indicate potentially detrimental levels of electrical conductivity (EC) and sodium adsorption ratio (SAR) which may jeopardize reclamation success. Thus, the operator proposes to implement revegetation test plots to determine the suitability of existing fill material as a plant growth medium.

The Division will determine, based on the physical and chemical characteristics of the proposed substitute material and the results of revegetation test plots, whether existing fill material will be suitable substitute topsoil material.

Chemical and physical analyses of topsoil material removed from the Waste Rock Storage area and the Cottonwood Fan Portal area were performed. Profile descriptions and chemical and physical data indicate no characteristics that would jeopardize reclamation success within the salvaged material.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.23 Topsoil: Storage-(HS)

Existing Environment and Applicant's Proposal

No topsoil was removed or stockpiled at the Cottonwood/Wilberg Mine area.

Topsoil was removed at the Cottonwood Fan Portal area from approximately five acres and placed in two separate storage areas (page 3-29). The topsoil storage piles have been protected against wind and water erosion by establishing a perennial vegetative cover (field inspection by Division staff, conducted January 23, 1989).

The berm structures containing salvaged topsoil from the Waste Rock Storage area have and will be revegetated to minimize erosion (Appendix III, page 3).

Compliance

Removed topsoil from the Cottonwood Fan Portal area has been placed within the permit area and protected from wind and water erosion by a perennial vegetative cover. Immediate redistribution of topsoil is not practical because of the operational status of the area.

The area where topsoil has been stockpiled does not pose any imminent danger of slope failure (Appendix XVIII).

The "topsoil" salvaged from the Waste Rock Storage area is temporarily stored within the retainment berm surrounding each storage cell and is adequately protected from wind and water erosion by vegetation cover on the surface of the retainment berm.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.24 Topsoil: Redistribution-(HS)

Existing Environment and Applicant's Proposal

The final reclamation plan for the Cottonwood/Wilberg Mine area and the Waste Rock Storage area is described on pages 4-18 through 4-21.1.

The upper 18 inches of fill material, if demonstrated to be a suitable plant growth medium for final reclamation (see discussion under UMC 817.22), will be excavated from the fill slopes and temporarily stored while backfilling and grading activities occur. Prior to seedbed preparation and following scarification of the regraded spoils, temporarily stored "topsoil" will be placed on the newly-graded surface at a depth of 6-12 inches (page 4-11). All final grading and "topsoil" placement will be conducted parallel to the contour. If surface compaction has developed, it will be alleviated by hand or mechanical tillage. Topsoil will be mechanically roughened (backhoe or chisel plow) to maximize surface roughness. Mulch will be applied at a rate of two tons/acre and netting will cover mulch.

The final revegetation plan may be revised to incorporate the results of interim revegetation efforts (pages 4-11 through 4-17) and test plot results (pages 4-17 to 4-19). Revisions will be approved by the Division prior to implementation.

Compliance

Existing fill material, if proven suitable, will be utilized to cover all disturbed areas at the Cottonwood/Wilberg Mine area with 6-12 inches of substitute topsoil.

Substitute topsoil will be prepared to promote favorable revegetation establishment. The redistribution plan is adequate to support the postmining land use of livestock grazing and wildlife habitat.

Scarification of regraded spoils and mechanical tillage of the substitute topsoil will alleviate compaction caused by machinery traffic and ensure good overburden/soil contact, thereby preventing potential slippage and create a soil profile conducive to root penetration.

Regraded "topsoil" will be left in a roughened condition to provide micro-relief to reduce runoff and promote infiltration.

Hay mulch and netting will ensure adequate protection from wind and water erosion by raising the wind profile above the soil surface and acting as a barrier against raindrop impact.

A topsoil distribution plan for the Cottonwood Fan Portal area has not been submitted.

The applicant will be in compliance when the following stipulation is met:

Stipulation 817.24-(1)-(HS)

1. Within 30 days of permit approval, the applicant must submit an adequate topsoil redistribution and final revegetation plan for the Cottonwood Fan Portal area.

UMC 817.25: Topsoil: Nutrients and Amendments-(HS)

Existing Environment and Applicant's Proposal

The applicant has committed to sample redistributed topsoil prior to seeding (Item 3, page 4-20). Necessary fertilization and soil amendment application will be instituted as determined by soil test results following redistribution.

Compliance

The applicant has committed to sampling redistributed topsoil to determine type and rate of fertilizer required.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.41 Hydrologic Balance: General Requirements

Existing Environment and Applicant's Proposal

Surface Water - (DW)

The applicant describes the current disturbed and undisturbed drainages in Appendix XX.

A general description of the existing environment is contained in Chapters I and II of Appendix XX.

The regional water quality and quantity monitoring plans for surface and ground waters are found in Chapter IV of Appendix XX.

Treatment facilities (i.e. sedimentation ponds) specifications are found in Appendix XIII.

Part 4 of the PAP includes a detailed description of the reclamation hydrology, including restoration of all disturbed areas, a reclamation monitoring plan and specific designs associated with restored channels for the Cottonwood/Wilberg Mine area. Specific information is not presented for the Cottonwood Fan Portal area.

Ground Water - (RVS)

The applicant provides information about aquifers, springs and mine inflows in Appendix XX. Supplementary information about ground water is given on Maps HM-1 through HM-5.

Aquifers. The applicant describes the North Horn Formation, Blackhawk Formation, and Star Point Sandstone as the major water-bearing lithostratigraphic units in the permit and adjacent area (Appendix XX, pages 4 through 11). The applicant concludes that a zone of "perched" aquifers occurs within certain permeable sandstone channels in the North Horn Formation and Blackhawk Formation, whereas the aquifer occurring in the Star Point Sandstone is of a more regional nature.

The applicant identifies the Roans Canyon Fault Graben, Straight Canyon Syncline and Deer Creek Fault (Map HM-1) as primary structural features that influence ground-water movement on East Mountain. The applicant suggests that the Roans Canyon Fault Graben and Straight Canyon Syncline acts to intercept and directs southerly ground water towards the southwest (Map HM-1). The Deer Creek Fault appears to be an aquiclude to eastward movement of ground water (Appendix XX, page 15).

Ground-Water Use. Ground water within and adjacent to the permit area is used by wildlife and for stockwatering and domestic purposes. Table HT-7 lists five springs with appropriated water rights within the permit area. Mining has occurred beneath two of the springs with water rights and is projected to occur beneath one additional spring with a water right. Flow from 17 springs is collected in ponds or troughs. Three springs are considered to be primarily used by wildlife.

Springs. Map HM-5 indicates 52 springs occur within the proposed permit area. Total discharge from springs is approximately 300 gpm (Annual Hydrologic Monitoring Reports, 1979-1988). Springs occurring in the North Horn Formation account for approximately 50 percent of the total spring discharge.

Table HT-2 summarizes water quality samples collected at 12 springs from 1979 through 1987. These data indicate water quality degrades in terms of TDS, SO₂, Ca, Mg, Na, K and Hardness as it passes through the Flagstaff Limestone and North Horn Formation and into the Price River Formation. The applicant also recognizes increases in TDS from north to south and suggests this change is due to an overall southerly direction in ground-water flow (Appendix XX, page 20).

Mine Water. Mine water is currently monitored at six locations in the Cottonwood/Wilberg Mine (Map HM-3). In the past, the applicant has monitored 53 separate mine inflows until they ceased flowing. Most mine inflows have been associated with sandstone channels (Maps HM-3).

Data from mine inflows and underground boreholes indicate water quality undergoes further degradation as it moves vertically through the East Mountain aquifer system (Table HT-3). Total mine inflow is estimated to be 47 gpm (Annual Hydrologic Monitoring Reports for 1988, page 56) and mine water discharge is approximately 15 gpm.

Most of the mine inflow is directed to the main Cottonwood/Wilberg Mine sumps (Figure HF-5). A portion of the sump water is utilized for underground mining operations and the remainder is discharged to the Left Fork of Grimes Wash according to the approved UPDES permit (Appendix XX, page 21). Mine inflow that does not report to the main sump is discharged at Miller Canyon according to an approved UPDES permit (Appendix XX, page 21).

Mining Methods. Longwall mining has occurred in the Hiawatha seam beneath Sections 15 and 22 (T17S, R7E) adjacent to the Deer Creek Fault and in portions of Section 29 and 28 (T17S, R7E) south of the Left Fork of Grimes Wash (Map 4-5). Six springs overlie these previously mined areas.

Longwall mining is continuing to occur in the Hiawatha seam in the remaining portions of Sections 28 and 29 (T17S, R7E) and is projected to occur in portions of Sections 32 and 33 (T17S, R7E) during the proposed permit term. One spring (84-56) overlies these areas of current and projected mining where overburden thickness is approximately 1500 feet (Map 2-10).

The Blind Canyon seam occurs in Sections 17, 18, and 19 (T17S, R76) and Sections 13 and 24 (T17S, R6E). These resources have been dedicated to the Cottonwood/Wilberg Mine. Mining is projected to begin, near the end of the proposed permit term, in this area during 1994 (Map 3-2). Nine springs overlie this area where overburden thickness ranges from 1250 to 2000 feet. (Maps HM-5 and 2-11).

Compliance

Surface Water -DW

The applicant has provided the necessary facilities to treat all disturbed drainage. The applicant provides plans that address erosion control methods, including designs for riprap protection.

The reclamation of the Cottonwood/Wilberg Mine area will be achieved in a manner which will safeguard against any long term adverse changes to the hydrologic balance.

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

Ground Water - (RVS)

The applicant provides information about the use, occurrence and characteristics of ground-water resources within and adjacent to the permit area. Moreover, the extent and location of underground mining activities (past, present and future) have been identified and described.

Springs. Baseline and operational spring monitoring data are available to superimpose over projected areas of mining to identify potential impacts to the East Mountain ground-water resources. Although overburden thickness in conjunction with extraction methods suggests minimal longwall-induced aquifer deformation, the applicant recognizes that the potential for impacts to spring recharge and discharge above mine workings and productivity of ground water resources cannot be disregarded. The applicant proposes to conduct water monitoring at representative springs to identify longwall-induced mining impacts.

Mine Inflow. Mine inflow rates have been quantified and a suite of data indicates ground-water quality degrades as it vertically moves through permeable lithologies that occur on East Mountain.

Mine water discharge has occurred at the Left Fork of Grimes Wash and Miller Canyon Breakout. During 1988, no water was discharged to the Left Fork of Grimes Wash and 700,000 gallons were discharged at Miller Canyon (Annual Hydrologic Monitoring Report for 1988).

Mine development during the proposed permit term will primarily occur in Sections 28, 29, 32 and 33 (T17S, R7E) where ground-water resources appear to be more limited. Accordingly, it is anticipated that mine inflow will not significantly increase during the proposed permit term.

The applicant is in compliance with the ground-water portion of this section.

Stipulations UMC 817.41-(1)-(DW)

1. Within 30 days of permit approval, the applicant must submit a complete reclamation plan for the Cottonwood Fan Portal area. This plan must include calculations and designs for channel or drainage restoration according to the 100-year 24-hour event, if appropriate.

UMC 817.42 Hydrologic Balance: Water Quality Standards and Effluent Limitations-(DW)

Existing Environment and Applicant's Proposal

All disturbed area drainage at the Cottonwood/Wilberg Mine area is passed through a series of sedimentation ponds which discharge into Grimes Wash. All the undisturbed drainage is diverted around the disturbed areas by means of ditches and culverts and subsequently, discharged into Grimes Wash.

The same scenario exists at the Cottonwood Fan Portal area except all water is discharged into Cottonwood Creek. (Appendix XIII).

Mine water from the Cottonwood/Wilberg Mine is discharged in two locations: the Left Fork of Grimes Wash and Miller Canyon. Both locations are monitored according to an approved plan and are UPDES discharged points. (Appendix XX, Chapter I, Part E, page 21).

Compliance

Any discharge to either Grimes Wash or Cottonwood Creek is adequately treated to achieve compliance with all applicable state and federal effluent limitations.

Sedimentation ponds and other treatment facilities will be maintained until the disturbed area has been restored and the vegetation requirements of UMC 817.111-117 are met and the quality of the untreated drainage from the disturbed area meets all applicable state and federal water quality standards as described in Part 4, pages 4-2 through 4-7 of the PAP.

Drainage from the underground workings is passed through a series of sumps and then an oil skimmer before being discharged at two approved UPDES points (Appendix XX, Chapter I, Part E, page 21).

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-(DW)

Existing Environment and Applicant's Proposal

All temporary diversions were designed and constructed according to the new Utah Rules Pertaining to Coal Mining and Reclamation Operations and the current 30 CFR. The design storm was the 10-year 6-hour event.

Compliance

Cottonwood/Wilberg Mine area: Disturbed and undisturbed drainage diversions and conveyance systems are all adequately sized to pass the 10-year 6-hour storm.

Cottonwood Fan Portal area: Disturbed and undisturbed temporary diversions and conveyance systems are designed to adequately pass the 10-year 6-hour storm (Appendix XIII).

No permanent diversions exist.

Ditches UD-3, UD-4 and UD-5 at the Cottonwood Fan Portal area have riprap linings. Linings with D50 of 1.5 feet and filter blankets of a 12-inch thick layer of Type II granular bedding were included (Appendix XIII, page 8). Ditch DD-5 drains a disturbed area which is not treated with a sedimentation pond. Four gabion structures are used to effectively trap any sediment, slow erosive velocities of any flow and act as energy dissipators.

Ditches UD-3 and UD-4 at the Cottonwood/Wilberg mine area have riprap linings with D50 of 1.5 feet. Filter blanket gradation of a 12-inch thick layer of Type II granular bedding was included. This will prevent failure of the fine grained subsoils (Appendix XIII, page 31).

All temporary diversions at the Cottonwood/Wilberg mine area will be removed and the affected area reclaimed when the structures are no longer needed. (Part 4, pages 4-2 through 4-7).

All temporary diversions have been designed with adequate freeboard of 0.5 feet (Appendix XIII).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.44 Hydrologic Balance: Stream Channel Diversions-(DW)

Existing Environment and Applicant's Proposal

This regulation covers any diversion of flow from perennial and intermittent streams which drain areas greater than one square mile. UA-1 and UA-6, undisturbed areas at the Cottonwood/Wilberg mine area meet this criteria. (Appendix XIII).

These temporary diversions were designed according to the new Utah Rules Pertaining to Coal Mining and Reclamation Operations and the current 30 CFR. The design storm was the 10-year 6-hour event.

Compliance

The longitudinal profile of the stream, channel and floodplain were designed and constructed to remain stable and to prevent additional contributions of suspended solids to streamflow or to runoff outside the permit area. (Appendix XIII).

These ditches will be reclaimed according to the reclamation plan described in Part 4, pages 4-2 through 4-7. The natural drainage pattern will be restored to establish a shape with environmentally acceptable gradient, cross sections, riffles, pools, and drops that approximates natural stream channel characteristics.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.45 Hydrologic Balance: Sediment Control Measures-(DW)

Existing Environment and Applicant's Proposal

The applicant has provided plans for sediment and erosion control (Appendix XIII). All drainage from disturbed areas is treated by conveying drainage to sediment ponds or effectively treating the water with alternative sediment control measures (i.e. gabion structures).

Compliance

The ability to effectively treat disturbed drainage has been demonstrated by the applicant meeting effluent limitations at UPDES discharge points and not degrading the overall water quality from undisturbed and disturbed areas. Documentation is given in both Appendix XX (Hydrology) and the applicant's annual report for 1988.

Water produced in-mine is treated in a series of sumps located in 1st North and Wilberg Main. These sumps act as settling basins to effectively remove settleable solids. Mine water discharge is passed through an oil skimmer in accordance with the stipulations of the Cottonwood/Wilberg Mine Discharge Permit UT-0022896-01. Mine water then is subsequently discharged into the Left Fork of Grimes Wash. Small quantity discharges occur at the Miller Canyon breakout, after undergoing treatment. This discharge is in accordance with the stipulations of Cottonwood/Wilberg Mine Discharge Permit UT-0022896-04.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.46 Hydrologic Balance: Sedimentation Ponds-(DW)

Existing Environment and Applicant's Proposal

All disturbed area surface drainage is passed through one, or a series of sedimentation ponds, with the exception of one region at the Cottonwood Fan Portal area. Four gabion structures are in place (area DA-4).

The ponds were sized according to the new Utah Rules Pertaining to Coal Mining and Reclamation Operations and the current 30CFR. This involves total containment of at least one year of sediment and the 10-year 24-Hour storm volume. Temporary inlet structures are sized to pass the 10-year 6-hour event and emergency decant structures for the 25-year 6-hour event.

Primary decant devices exist on the two Cottonwood/Wilberg Mine area ponds. Decants consist of one, three inch diameter pipe for each pond. The ponds at Cottonwood Fan Portal area do not have primary decant devices.

Compliance

Cottonwood/Wilberg Mine area - The total runoff volume produced from a 10-year 24-hour event is 2.9 acre-feet. One year sediment volume, calculated using .1 acre-feet of sediment/acre of disturbed land and a sediment delivery ratio of 64.5 percent, was 0.85 acre-feet. The total volume needed between the two ponds is 3.75 acre-feet. The two ponds contain 4 acre-feet of storage volume.

Cottonwood Fan Portal area-north pond - Calculations were made in the same manner as previously described.

Runoff volume, 10-year 24-hour storm	- 0.008 acre-feet
Sediment volume, 1 year accumulation	- 0.118 acre-feet
Combined, total pond volume needed	- 0.126 acre-feet*
Actual pond volume	- 0.100 acre-feet*

* The method used to estimate sediment volume overestimates actual amounts under most conditions. The 0.026 acre-foot discrepancy can be attributed to this fact. The pond is sized correctly.

Cottonwood Fan Portal area-south pond - Calculations were made in the same manner as previously described.

Runoff volume, 10-year 24-hour storm	- 0.267 acre-feet
Sediment volume, 1 year accumulation	- 0.300 acre-feet
Combined, total pond volume needed	- 0.567 acre-feet
Actual pond volume	- 0.600 acre-feet

A breakdown of the applicant's calculations are found in Appendix XIII.

Four rock gabion structures are effectively being used as sediment traps, controlling runoff and erosion from DA-4 at the Cottonwood Fan Portal area.

All above ponds meet effluent limitations according to their UPDES permits. (See 1988 Annual Hydrologic Monitoring Report and Appendix XX).

The applicant will remove sediment from the ponds when the volume of sediment accumulates 60 percent of the design sediment storage volume (1 year accumulation). See pages 3-26 and 3-33.

Each pond was designed, constructed and is inspected under the supervision of a registered professional engineer.

The sedimentation ponds will be maintained and remain functional until the disturbed area has been reclaimed. Drainage entering ponds meets the applicable state and federal water quality standards for the receiving streams. After pond removal, the areas will be regraded and revegetated. See pages 4-2 through 4-7.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.47 Hydrologic Balance: Discharge Structure-(DW)

Existing Environment and Applicant's Proposal

Discharge structures have been sized for the 25-year 6-hour event according to the new Utah Rules Pertaining to Coal Mining and Reclamation Operations and the current 30CFR.

Compliance

Discharge structure designs are adequate to meet the requirements of this section.

The operator is in compliance with this section

Stipulations

None.

UMC 817.48 Hydrologic Balance: Acid and Toxic Forming Materials-(HS)

Existing Environment and Applicant's Proposal

The applicant commits to covering any toxic-and/or acid-forming material with four feet of material (Appendix VII, page 7).

Procedures to identify acid-and toxic-forming materials and coal/rock ratio within the Waste Rock Storage area are described in Appendix VII, pages 8, 9 and 12.

Compliance

The applicant's proposal for identifying acid-and toxic-forming materials does not adequately address the requirements of this section.

Analysis of disposed material in waste rock cells 1 through 6 has not been submitted. The waste rock cells are not designed to bury acid-and toxic-forming materials (Appendix VII, Figures 1 and 2).

Data given in Appendix VII, Table 2, indicate roof and floor materials have unacceptable levels of SAR (Mean = 17.36 S.D. = 15.14). High SAR's may detrimentally affect revegetation.

Appendix VI Coal Lithologic Log, Drill Hole EM-23 C indicates a low pH (3.3, 2.9, 3.7) within the mudstone and siltstone directly below the Hiawatha seam. Additionally, roof and floor analyses (Appendix VII, Table 2) indicate high FeS₂ (pyritic/marcasite) levels (% FeS Mean = 8.15 S.D. = 10.82). These materials may be detrimental to surface and ground water as well as established vegetation.

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

Stipulation UMC 817.48-(1)-(HS)

1. With 30 days of permit approval, the applicant must submit: (1) Previous waste rock data collected from the completed waste rock cells (1 through 6); (2) Laboratory analysis of previously collected roof and floor samples, and sample location map; (3) A commitment to annually monitor roof, floor, and midseam material for its potential acid- and/or toxic-forming characteristics according to Division's Guidelines for the Management of Topsoil and Overburden (i.e. Water soluble Selenium and Boron, Clay Content, pH, Acid-Base Potential, SAR, E.C.); (4) a commitment to properly bury or otherwise treat all acid-and toxic-forming materials within 30 days of initial exposure at the mine site.

UMC 817.49 Hydrologic Balance: Permanent and Temporary Impoundments-(DW)

Existing Environment and Applicant's Proposal

No permanent or temporary impoundments are proposed to be left in place following final reclamation. Sedimentation ponds at the

Cottonwood/Wilberg Mine area will be left in place during initial reclamation and through the bonding liability period. (See Part 4, pages 4-2 through 4-7).

The Cottonwood Fan Portal area also has no permanent impoundments.

Compliance

No permanent impoundments will be retained and temporary impoundments meet the requirements of UMC 817.46.

The applicant is in compliance with this section.

Stipulation

None.

UMC 817.50 Hydrologic Balance: Underground Mine Entry and Access Discharge -(DW)

Existing Environment and Applicant Proposal

Rocks in the mine plan and adjacent areas strike northeast and dip approximately three degrees to the northwest. However, northwest of the Straight Canyon Syncline, the dip is generally southeast. Mine inflow is measured to be 46 gpm and is collected in two sump areas prior to discharge or in-mine use. Mine inflow is of marginal quality with high historical concentrations of calcium, magnesium, chloride and sulfate.

Portals are updip from the workings and located at elevations ranging from 7300 to 7600 feet. Due to the Straight Canyon Syncline, the Cottonwood Fan Portal is located at the lowest elevation. A gravity drain piping system will be implemented at this site during final reclamation (portal sealing) to alleviate concerns of direct discharge after abandonment. This will accommodate the flooding of workings and associated build-up of hydraulic head.

Compliance

Portals have been located and constructed to control gravity discharge from the mine. The mine currently experiences inflow of marginal water quality.

Following mine closure, workings will flood and unplanned discharges of marginal water quality may occur. The applicant commits to monitoring unplanned discharges after mining for compliance with UMC 817.42 and other applicable state and federal regulations. Monitoring will be conducted quarterly (as accessible) and treatment will be initiated, if necessary, during the period of discharge or until bond release (Appendix XX, page 21).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.52 Surface and Groundwater Monitoring-(DW)

Existing Environment and Applicant's Proposal

The applicant monitors streams (Hydrology Map, 1988 Annual Hydrologic Monitoring Report), springs (Spring Map, 1988 Annual Hydrologic Monitoring Report), mine water discharge, sediment pond outlets (both under UPDES regulation) and mine inflow (Map #4, 1988 Annual Hydrologic Monitoring Report) locations. Current monitoring plans are discussed in the 1988 Annual Hydrologic Monitoring Report.

Compliance

The applicant monitors both surface and ground water following the Division's Water Monitoring Guidelines. Monitoring is adequate to measure any changes in the hydrologic balance.

The applicant submits quarterly reports that include laboratory analyses and field parameters. Long term effects are addressed in annual reports.

Monitoring will continue through the cessation of mining activities and the reclamation of all surface disturbed areas. Monitoring points prior to and directly after the final sedimentation pond will be implemented during this time at the Cottonwood/Wilberg Mine area (See Chapter IV, Appendix XX). No reclamation monitoring plan has been established for the Cottonwood Fan Portal area.

The applicant will be in compliance when the following stipulation has been met.

Stipulation UMC 817.52-(1)-(DW)

1. Within 30 days of permit approval, the applicant must submit a reclamation water monitoring plan for the Cottonwood Fan Portal area.

UMC 817.53 Hydrologic Balance: Transfer of Wells-(DW)

Existing Environmental and Applicant's Proposal

The applicant does not propose to transfer exploratory or monitoring wells. Therefore, this section is not applicable.

Stipulations

None.

UMC 817.55 Hydrologic Balance: Discharge of Water into an Underground Mine-(DW)

Existing Environment and Applicant's Proposal

The applicant currently does not discharge or transfer water between underground workings. All water produced in the mine is either used for mining, dust suppression, culinary purposes, or is discharged to the Right Fork of Grimes Wash, or at the Miller Canyon breakout under UPDES regulation. Locations of the breakouts can be found on the Hydrology Map, 1988 Annual Hydrologic Monitoring Report.

Compliance

Water produced and subsequently discharged from the Cottonwood/Wilberg Mine workings does not show any water quality problems or potential detrimental impacts to the hydrologic balance.

The applicant is in compliance with this section.

Stipulations

None.

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

Existing Environment and Applicant's Proposal

The applicant does not propose to retain ponds, diversions or culverts following final reclamation.

Compliance

This section is not applicable.

Stipulations

None.

UMC 817.57 Hydrologic Balance: Stream Buffer Zones-(DW)

Existing Environment and Applicant's Proposal

Grimes Wash below the mine contains a biologic community as described under paragraph (c) of this rule and therefore, must be protected and a buffer zone established.

Above the mine, both Right and Left Forks of Grimes Wash are ephemeral and cannot be determined to have a community as described under paragraph (c).

The main drainage through the Cottonwood/Wilberg Mine area was completely interrupted during construction of the surface facilities. The undisturbed drainage from above the site is transferred to below the site by an extensive culvert system (See Appendix XIII). The reclamation plan contained in Part 4 outlines methods of stream channel rehabilitation which will establish a biologic community described in paragraph (c) of this rule.

Compliance

Proposed upgrades to the hydrologic system which include drop structures, steps and energy dissipators will enhance stream habitat following reclamation (See Part 4).

All sensitive areas are identified and protected as critical stream habitat by buffer zones.

The applicant is in compliance with this section.

Stipulation

None.

UMC 817.59 Coal Recovery-(PGL)

Existing Environment and Applicant's Proposal

The applicant has an approved Resource Recovery and Protection Plan (R2P2) issued August 17, 1982 by the Bureau of Land Management (BLM). Recovery methods to obtain the maximum amount of coal are described on page 3-13.

Compliance

The applicant is conducting mining operations so as to maximize the utilization and conservation of coal at the Cottonwood/Wilberg Mine.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.61-.68 Use of Explosives-(PGL)

Existing Environment and Applicant's Proposal

There are no explosive storage and handling facilities at the Cottonwood/Wilberg Mine (page 3-52.1). Therefore, this section is not applicable.

UMC 817.71-.74 Disposal of Underground Development Waste and Excess Spoil-(WAW)

Existing Environment and Applicant's Proposal

The applicant's proposal for the Waste Rock Storage area is contained in Appendix VII. The applicant presently disposes underground development waste, sediment from sedimentation ponds, and trommel reject in a 16-acre site which is part of an approved 48 acre BLM right-of-way. The present site is nearing capacity and the applicant plans to initiate a permit application for a new Waste Rock Storage area in mid 1989.

The Waste Rock Storage area is situated on a gently sloping (approximately seven percent slope) and naturally stable area (Exhibit 10, page 10). The disposal area is constructed of earthen retainment berms which incorporate topsoil or substitute soil medium for reclamation. Typical slopes of the berms are 2h:1v (Figures 1 and 2, DWG CM-10361-WB) with a varying top width. Drawing CM-10361-WB and as-built drawings KS1142E have been certified by a professional engineer. The earthen containment structures are designed to contain, without discharge, all storm runoff from a 10-year 24-hour storm event (page 4, Figures 1 and 2).

Fill material will be hauled by truck to the facility then placed in horizontal lifts two feet thick and compacted. The applicant also proposes to limit the coal/rock ratio to 50/50 (Appendix VII, page 8). During reclamation, the interior berms will be removed and used to cover the stored rock.

The applicant commits to conduct inspections quarterly and during critical construction periods. Reports will be submitted to the Division within two weeks of inspection and retained at the Huntington office (Appendix VII, page 11).

Compliance

The applicant's proposal addresses the designs and precautionary measures that will be taken to ensure surface and ground waters are not degraded, stability of the fill, and the land is reclaimed and revegetated. Topsoil or substitute soil mediums were collected and stored in the retainment berms for utilization during reclamation. The applicant has taken steps to minimize erosion including maintaining 2h:1v slopes and revegetation of disturbed areas.

The facility is located on a moderately sloping area (approximately seven percent), therefore, keyway cuts or rock toe buttresses are not required.

The fill material is placed in horizontal lifts, two feet thick, and compacted. The final configuration of the fill will be compatible with the postmining land use. The stability analysis demonstrates a safety factor of at least 1.5 (Appendix XVIII).

The applicant commits to continually inspect the site for stability on a quarterly basis and during critical construction periods.

The disposal area does not contain springs, natural or man-made water courses, or wet weather seeps, therefore, an underdrain system is not required. Also, adequate stability of the structure has been demonstrated and therefore the requirements of foundation or abutment testing are not required.

There are no plans to return underground development waste or excess spoil to underground workings.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.81-.88 Coal Processing Waste Banks: General Requirements-(PGL)

Existing Environment and Applicant's Proposal

The applicant disposes of coal processing wastes in the Waste Rock Storage area (See Appendix VII). This material is placed and

compacted in two foot horizontal lifts. The applicant commits to cover any acid-or toxic-forming materials with four feet of non-acid, non-toxic-forming materials.

No coal processing waste will be returned to underground workings.

Compliance

The construction, inspection, and reclamation plans for the Waste Rock Disposal area are adequate (see UMC 817.71-.74). Therefore, the disposal of coal processing waste in the Waste Rock Storage area meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.89 Disposal of Non-Coal Waste-(PGL)

Existing Environment and Applicant's Proposal

A trash chute and collection box have been provided for disposal of non-coal waste material. When the dumpster is full it is transported to an approved landfill. During reclamation, the concrete trash chute and collection box will be demolished and used for backfill (page 3-43).

Compliance

The applicant's proposal for disposal of non-coal waste meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

**UMC 817.91-.93 Coal Processing Waste: Dams and Embankments:
General Requirements-(PGL)**

Existing Environment and Applicant's Proposal

There are no coal processing dams or embankments at the Cottonwood/Wilberg Mine. Therefore, this section is not applicable.

UMC 817.95 Air Resources Protection-(WAW)

Existing Environment and Applicant's Proposal

The applicant's Air Pollution Control Plan is found on pages 3-59 and 3-60. Fugitive dust control measures have been applied during construction of the facilities (i.e., dust collection system, pages 3-41 to 3-43) and will be applied throughout the life and subsequent reclamation of the site.

All service and haul roads at Cottonwood/Wilberg Mine are asphalt surfaced with the exception of the fan access.

Revegetation efforts have been implemented on all non-use areas in the portal yard, and will be repeated (as necessary) until vegetation is established (page 3-59).

Fugitive dust controls are implemented throughout the coal handling process. All conveyors are covered and equipped with belt scrapers. Dust collection systems with baghouses are located at the storage sites, crushing and cleaning facility, and the truck loadout (pages 3-59, 3-60). The high moisture content of the coal also aids in fugitive dust control.

Compliance

The applicant has implemented approved fugitive dust controls at the Cottonwood/Wilberg Mine facility, and has taken additional steps to ensure that fugitive dust is controlled (i.e. revegetation). Moreover, the State Department of Health determined that the applicant's proposal to modify the Cottonwood/Wilberg Mine to produce 6 million tons/yr. are consistent with the requirements of the Utah Air Conservation Regulations (UACR) and the Utah Air Conservation Act. No PSD permit is required for this source (letter dated January 31, 1985 from Brent C. Bradford, UAC committee).

The applicant is in compliance with this section.

Stipulations

None.

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

Existing Environment and Applicant's Proposal

Fish and wildlife resource information is located on: (1) pages 2-159 to 2-175 and page 4-50 et seq. (which includes a plan for fish

and wildlife protection); (2) Maps 2-19, 2-20a, and 2-20b; and (3) Appendix XVI. The Utah Division of Wildlife Resources (DWR) was the primary contributor, although the applicant, the U.S. Fish and Wildlife Service (USFWS), the U.S. Forest Service (USFS) and the Bureau of Land Management (BLM) provided supplemental information and input.

The most important biological concerns involve subsidence impacts to: (1) Nesting golden eagles (Appendix XVI); and (2) Hedysarum occidentale var. canone (page 2-107) and native vegetation as a result of slumping or talus deposition (pages 2-142.1 and 2-142.2). Evaluations of impact and impact mitigation plans are included in the above citations.

Compliance

The applicant has conducted aerial raptor surveys encompassing a 10-mile radius (Appendix XVI). Nests which may be jeopardized by mining disturbances are monitored annually.

The applicant has obtained the necessary permits from USFWS and DWR to take golden eagle nests in Newberry Canyon.

A commitment has been made to notify USFWS of nests and raptors not previously reported (page 4-52). Cliff subsidence will be monitored (pages 4-44 to 4-47), as well as subsidence impacts to nesting golden eagles (Appendix 16). Powerlines have been constructed to raptor safety standards, and have received USFWS approval (page 4-50).

No important fisheries occur within the permit area (page 4-50). Creeks and drainages in the impact zone of surface disturbance will be protected by diversions and dust control measures (page 4-51).

In the event that subsidence interrupts streamflow, the applicant commits to appropriate restoration (page 4-54). Springs or seeps which are lost for wildlife or livestock use will be replaced by guzzlers (page 4-54).

The applicant has committed to prevent, control and suppress range, forest, and coal fires (page 4-55).

Because wildlife habitat is a postmining land use (page 4-38), species selected for revegetation (page 4-19) have been selected on the basis of proven nutritional and cover values for wildlife.

The applicant will not use persistent pesticides, unless approved by the Division (page 4-55).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.99 Slides and Other Damage-(PGL)

Existing Environment and Applicant's Proposal

The applicant commits to notify the Division as soon as possible at any time a slide occurs which may have a potential adverse effect on health, safety, and the environment. Remedial measures, agreed upon by the applicant and the Division, will be employed to remedy the situation (page 3-73).

Compliance

The applicant's commitment meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.100 Contemporaneous Reclamation-(BAS)

Existing Environment and Applicant's Proposal

The applicant has committed to revegetate, as contemporaneously as practicable, all disturbed areas which are no longer required for mining operations (pages 4-15 to 4-17).

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.101 Backfilling and Grading: General Requirements-(PGL)

Existing Environment and Applicant's Proposal

The applicant constructed several major cut and fill areas to provide sufficient working areas for the Cottonwood/Wilberg Mine facilities. The applicant proposes to regrade the mine facilities

area to the approximate premining topography. The grading plan for the facilities area is described on pages 4-1 through 4-5. Postmining topographic drawings (Plates 4-1 and 4-2) indicate the volumes of material to reclaim the area. Highwalls to be retained are shown on Plates 4-1 and 4-2 and justified on pages 4-7.1. The final configuration for the Cottonwood Fan Portal area is shown on Plate 3-14 and explained on pages 4-4-A and 4-5. A commitment to submit within 60 days prior to approval the stability analysis for the final reclaimed slopes demonstrating static safety factor of at least 1.5 was included on page 4-10.3.

Compliance

The applicant proposes to return the surface disturbances associated with Cottonwood/Wilberg facilities area and Cottonwood Fan Portal area to approximate original contours. All roads will be backfilled except for the haul road, which is a county road. The applicant's justification for retention of highwalls is adequate. The commitment to submit analysis slope stability of the fills after reclamation that demonstrates a safety factor of at least 1.5 meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.103 Backfilling and Grading: Covering Coal and Acid-and Toxic-Forming Materials-(PGL)

Existing Environment and Applicant's Proposal

The applicant proposed a sampling program to detect the presence of acid-and toxic-forming materials (Appendix VII, pages 8, 9, and 12) at the Waste Rock Storage area. The applicant has committed to cover any acid-and toxic-forming materials with four feet of non-toxic and non-acid forming materials (Appendix VII, pages 7 and page 4-6).

Compliance

The applicant's commitment to bury any acid-or toxic-forming materials at the Waste Rock Storage area meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.106 Regrading or Stabilizing Rills and Gullies-(PGL)

Existing Environment and Applicant's Proposal

The applicant commits to fill, regrade and otherwise stabilize rills and gullies which develop in areas that have been regraded and topsoiled (page 4-6).

Compliance

The applicant's commitment meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.111 Revegetation: General Requirements-(BAS)

Existing Environment and Applicant's Proposal

Following completion of topsoiling and seedbed preparation, the final revegetation plan will be implemented (pages 4-18 to 4-20.1).

The final revegetation seed mix consists of six grass, six forb, four shrub, and two tree species, and follows USFS recommendations. Plantings of trees and shrubs will take place in the spring, following final reclamation (pages 4-20 and 4.20.1). Seed will be hand-broadcast with a hurricane spreader or applied by hydro-seeder at a rate of 83 Pls/ft² (page 4-20). Woody plants will be hand-planted at a rate of 1600 stems/acre. Mulch will be applied as described under UMC 817.114. Fertilizer will be incorporated, if soil test results warrant.

Compliance

The applicant has provided an acceptable revegetation plan, which will be followed, except where interim revegetation and test plot results dictate otherwise. All changes will be contingent upon prior Division approval (page 4-18).

All plant species in the final revegetation seed mix (page 4-19) are perennial, and capable of succession and regeneration.

Bond liability will continue for not less than 10 years. Sampling efforts, described on pages 4-20.2 and 4-20.3, will document whether vegetation is at least equal in extent to the reference area vegetation parameters, which are described on pages 2-101 to 2-114.

Revegetation methods, materials and timetables, are expected to achieve a permanent and diverse vegetative cover and recovery of pre-disturbance productivity.

The applicant is in compliance with this section.

Stipulations

None.

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

Existing Environment and Applicant's Proposal

Three introduced species are proposed for use in the final revegetation seed mix (page 4-19). An additional three species are proposed for interim revegetation (pages 4-15 and 4-16). These are smooth brome, crested wheatgrass, intermediate wheatgrass, small burnet, alfalfa, and yellow sweetclover. Each was recommended by the USFS as being: (1) consistent with regional forest management plans, and (2) adapted to the area to be reclaimed.

Compliance

The applicant proposes to test the revegetation seed mix, provided by USFS, as justification for the inclusion of introduced species. Proposed field trials are described on pages 4-17 to 4-19. A further justification, the applicant reported greenhouse study results, involving each species. Publications were cited, affirming the desirability of each species (pages 4-18.4, 4-18.5).

Inasmuch as all species in the seed mix (page 4-19) are present on the Manti-LaSal National Forest, all introduced species are believed to be compatible with the regional flora. As all species are highly palatable, compatibility with regional animal species may also be assumed.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.113 Revegetation: Timing-(BAS)

Existing Environment and Applicant's Proposal

Where necessary to effectively control erosion on disturbed areas before final reclamation, seeding and planting will take place as contemporaneously as practicable with completion of backfilling and grading (page 4-15). Where circumstances prevent immediate seeding, hand or mechanized tilling will be employed to break the surface crust (page 4-16). On interim reclamation, a 60 percent ground cover on the majority of the revegetated area will serve as the criterion for success--provided erosion has been adequately controlled (page 4-17).

Final reclamation seeding will take place contemporaneously with soil grading. Time of seeding will be late fall or early spring (page 4-18). If time lapses between seedbed preparation and seeding, any surface crust which develops will be broken up mechanically or by hand (page 4-19).

If over a month lapses between seedbed preparation and seeding, the soil will be protected with a mulch cover which will be mechanically or chemically anchored (page 4-18).

Compliance

The applicant meets the requirements of this section by proposing to: (1) seed immediately after seedbed preparation, during the normal period for favorable planting conditions (i.e., late fall or early spring), and (2) protect the soil with a temporary vegetative cover or mulch.

The applicant is in compliance with this section.

Stipulations

None.

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

Existing Environment and Applicant's Proposal

The applicant has opted to choose from among three types of mulch: (1) two tons per acre of hay mulch, anchored with plastic netting; (2) commercial erosion-control blanket, anchored per manufacturer's specifications; and (3) one ton per acre chemically tackified hydromulch (page 4-20).

The relative benefits of each will be tested in the applicant's test plots (page 4-17 to 4-19). Test plot results will influence ultimate mulch choice.

Compliance

All three mulch options, rates of application, and methods of anchoring meet the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.116 Revegetation: Standards for Success-(BAS)

Existing Environment and Applicant's Proposal

Success of revegetation will be measured by comparison with approved reference areas. Three reference areas have been established to represent pre-disturbance vegetation types for the mine's disturbed areas. Locations of reference areas are depicted on Plate 2-15.

Vegetative parameters of each reference area have been measured. Methods and results of all reference area sampling are described on pages 2-101 to 2-142.

The applicant commits to reassessment of the range condition of all reference areas at five year intervals to assure that they will be maintained in fair or better condition (page 4-20.2).

Compliance

Bond liability will continue for not less than 10 years under the conditions of this section.

Ground cover, woody plant density and production shall be considered equal to their respective reference area counterparts, when there is 90 percent success at 90 percent statistical confidence (page 4-20.2).

Monitoring commitments (pages 4-20.1, 4-20.2, and 4-21) are adequate to document progress toward realization of reclamation objectives. Should problems occur, requiring maintenance or repair work, the applicant has committed to take appropriate action (page 4-20.1).

The applicant is in compliance with this section.

Stipulations

None.

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

Existing Environment and Applicant's Proposal

All surface-disturbed land is owned and managed by USFS (Map 1-2). Although limited timber harvest may occur within the permit area (Map 2-19), the disturbed area is non-commercial forest land, and as such, falls under part (c) of this section.

The applicant has adopted USFS species recommendations for both trees and shrubs (page 4-19). Recommended stocking levels, however, were increased fourfold to 1600 stems/acre in order to meet reference area woody plant density standards (1461 shrubs and 78 trees, per page 2-110). Trees and shrubs will be planted in the spring.

Compliance

The applicant has satisfied USFS requirements in adopting that agency's recommendations for both species and stocking levels. The applicant commits to establishment of 90 percent of the stocking level of live, woody plants of the same life form of the approved reference areas with 90 percent statistical confidence (pages 4-20.2, 4-20.3).

Measurement of tree and shrub density will utilize the approved point-quarter method (page 4-20.2).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.121-.126 Subsidence Control-(RVS)

Existing Environment and Applicant's Proposal

The applicant provides information about subsidence on pages 4-41 through 4-49, Appendix XVI, and Maps 4-4 and 4-5. Supplementary subsidence information is provided in the Annual Subsidence Monitoring Reports from 1980 to 1988, and the document entitled "Assessment of Mining Related Impacts in Newberry Canyon, December 1987."

Mining will occur in the Hiawatha seam and Blind Canyon seam (Maps 2-4 and 2-5). Coal extraction will primarily occur by longwall methods (70 percent) with the remaining production occurring by continuous mining development (page 3-2). Multiple seam mining where the Blind Canyon seam directly overlies the Hiawatha seam will not occur during this permit term (Maps 3-1 and 3-2). The applicant estimates that maximum subsidence will be approximately 75 percent of extraction height (page 4-44). Accordingly, where a full ten feet are extracted, maximum subsidence is anticipated to be less than eight feet.

Overburden thicknesses range from approximately 500 to 2000 feet over longwall panels in the Hiawatha seam (Map 2-10). Whereas, overburden thicknesses range from 1600 to 2000 feet for longwall panels in the Blind Canyon seam (Map 2-11).

A review of the Annual Subsidence Monitoring Report for 1988 indicates 15 areas have undergone measureable vertical movement above the underground workings. An angle-of-draw was calculated for nine of the subsided areas. The average angle-of-draw is approximately 26 degrees. Map 4-5 shows areas where more than two feet of vertical movement has occurred.

Ground failure, both in the form of surface tension cracking and cliff spalling, has occurred in Newberry Canyon above and adjacent to extracted longwall Panels 6 East and 7 East. Major spalling has occurred along cliffs that overlie and parallel the long axis of panels whereas, lesser spalling has occurred along cliffs that overlie and parallel headgate and/or tailgate areas of panels. Tension cracks have developed above and adjacent to Panel 6 East. They are oriented approximately parallel to the long axis of the panel. Approximately 1200 feet of overburden is present where tension cracking occurred 500 feet north of Panel 6 East. Longwall mining of the Hiawatha seam is proposed to occur beneath cliffs in Sections 33 and 32, T17S, R7E. Approximately 3.0 miles of cliffs that have been identified as raptor nesting habitat will be undermined (Map 2-19A).

The applicant identifies renewable resource lands above areas of current and projected mining (page 4-41). The applicant concludes, on the basis of mining methods, overburden thickness and past mining experience that impacts to renewable resource lands will be minimal (Pages 4-41 through 4-44). However, when subsidence impacts occur, the applicant commits to restore surface lands to a condition capable of supporting reasonably foreseeable use (page 4-48). The applicant also commits to repairing structures such as roads, fences and stock ponds that are damaged by subsidence.

The applicant has monitored subsidence since 1980 by photogrammatic and conventional surveys. Five subsided areas were initially identified in the 1980 survey. Ten areas have been added to the monitoring program since 1984. The applicant has compared photogrammatry and conventional ground surveys for monitoring subsidence above the Cottonwood/Wilberg 5-13th Right workings. Data indicate the photogrammatic method of surveying provides more detail because of the greater number of surveyed stations (Map 4-4). Accordingly, the applicant proposes to conduct subsidence monitoring by photogrammatic methods (Appendix XVI and Map 4-4).

The applicant commits to conducting photogrammatic subsidence monitoring once a year and a field survey (surface traverse) twice each year, during the spring and fall (Appendix XVI, page 4). Results of surveys will be submitted to the Division on an annual basis (Appendix XVI, page 5). The applicant will notify surface owners of the mining schedule (page 4-49).

No perennial streams, significant aquifers, public buildings or major impoundments occur within the areas projected to be mined during the proposed permit term.

Compliance

The applicant has provided information about mining methods and locations, overburden thickness and lithology, vertical movement, renewable resource lands and structures.

Maximum subsidence of eight feet is projected for areas at the southern end of East Mountain, primarily within Section 32, 33, and 28, T17S, R7E. Spring 84-56 occurs in Sections 28 (Maps 3-1 and 4-5 where overburden thickness is approximately 1750 feet (Map 2-10). In early 1994, at the end of the proposed permit term, mining of the Blind Canyon seam is projected to begin in the Flag Lake Canyon and Roans Canyon area of East Mountain (Section 18 and 19, T17S, R7E and Sections 13 and 24, T17S, R6E). Springs 84-53, 79-32, 79-33, 79-26 and 79-27 occur (Map 4-5) within the area of proposed mining where maximum subsidence is also projected to be eight feet. Overburden thickness ranges from 1250 to 2000 feet beneath these springs (Map 2-11).

Longwall mining of the Hiawatha seam is proposed for areas that underlie cliffs. Mining in Panels 10th East and 17th West appear to pose the greatest risk for cliff spalling because the panels are oriented parallel to cliffs. Development in Panels 9th East and 13 West through 16th West will be at a somewhat lower risk for cliff spalling because panels are oriented perpendicular to the cliffs.

Although the cliff area has been identified as raptor nesting habitat, no nests are currently located above the proposed mine workings. No other renewal resources have been identified in the areas that may be impacted by cliff spalling.

Although subsidence monitoring data suggest a low potential for subsidence-induced surface impacts when overburden thickness is greater than 1,200 feet, the possibility of subsidence-induced material damage that results in the reduction of reasonably foreseeable use of surface lands cannot be excluded. Accordingly, the applicant has provided plans to restore surface lands and structures in compliance with UMC 817.24.

The applicant has provided a subsidence monitoring plan that describes surveying methods, schedules for collecting and submitting quantitative data as required by UMC 817.121 and notifying surface owners according to UMC 817.122.

Mining will not occur beneath structures or resources described under UMC 817.126. Therefore, the requirements of UMC 817.126 are not applicable.

The applicant is in compliance with this section.

Stipulation

None.

UMC 817.131-.132 Cessation of Operations -(PGL)

Existing Environment and Applicant's Proposal

The applicant commits that before cessation of mining and reclamation operations for a period of thirty (30) days or more, a Notice of Intention to Cease or Abandon Operation will be submitted to the Division (page 4-47.2).

The applicant proposes to permanently reclaim the Cottonwood/Wilberg Mine.

Compliance

The applicant's commitment to submit the Notice of Intention to Cease or Abandon Operations to the Division with all of the required information as well as conduct the required monitoring meets the requirements of this section.

The PAP meets the requirements to permanently reclaim the site.

The applicant is in compliance with this section.

UMC 817.133 Postmining Land Use-(BAS)

Existing Environment and Applicant's Proposal

Land use information is described on pages 2-175 to 2-182. Land uses within the permit area include mining, recreation, livestock grazing, wildlife habitat, and limited timber harvest.

Postmining land uses are described on pages 4-38 and 4-39. Primary uses are wildlife habitat and livestock grazing.

Compliance

The reclamation plan (Part 4) is compatible with postmining land uses, and will restore wildlife, recreation, and livestock uses, commensurate with those conditions which existed prior to mining.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.150-.176 Roads-(WAW)

Existing Environment and Applicant's Proposal

There are five facility roads at the Cottonwood/Wilberg Mine area: 1) haul road, 2) truck turn-around, 3) service road 4) portal road, 5) fan access road (page 3-52).

The haul road is a continuation of the plant access highway, State Road No. 57. It is 28 feet wide for two-way traffic, with a grade of 8 to 12 percent. Construction consists of a 6-inch thick gravel base course on a prepared subgrade, topped with a 6-inch thickness of asphalt. Super-elevations on curves are designed for speeds of 40-50 mph.

The truck turn-around is also 28 feet wide. The road is level from the point of exit from the haul road through the platform scale at the truck loadout bin and around the 180° turn heading back to the haul road. A vertical curve in the road provides the transition to a 12 percent slope matching the slope of the haul road at the

junction of the two roads. Construction of the truck turn-around is the same as the haul road. Super-elevations on curves are designed for speeds of 5-30 mph. The haul road and truck turn-around are used for the transportation of coal, and therefore, are defined as Class I roads.

The haul road was designed and constructed by the Utah Department of Transportation (UDOT). The truck turn-around was included in the Roberts and Shaefer Facilities Design and Certification (page 3-58). Road plans and cross sections are in Appendix IX and a copy of the road construction variance is in Appendix X.

The service road starts with a 150-foot long transition section at the junction of the haul road and truck turn-around and terminates at the upper storage yard. The service road is 20 feet wide for two way traffic, with a nominal grade of 12 percent.

The portal road starts at the upper storage area, then turns west at a 6 percent grade to the elevation of the facility portals where it follows the existing grade, approximately 3 percent. Surfacing of the road terminates near the promontory substation. From this point, the road turns into the fan access road.

The fan access road is a dirt road constructed along an existing alignment and is essentially level.

The Cottonwood Mine access utilizes the portal road, to a point adjacent to the upper storage yard where a spur road was cut along the western coal outcrop providing an access to the main portal and fan portal.

The service road, portal road, and fan access road are used more than six months out of the year and therefore, are classified as Class II roads.

A class II access road is proposed for the Cottonwood Fan Portal. The road will utilize an existing road that originally served the Old Johnson Mine (page 3-21). Plans and cross sections are depicted on Maps 3-7, 3-8, and 3-12.

Roads will be cleared of snow and debris as needed to maintain proper drainage and utility. Resurfacing of roads will be performed as needed to maintain grade and prevent erosion (page 3-55).

The applicant's proposal for reclamation of roads is discussed on pages 4-3 through 4-5. The asphalt and gravel road base from the service road and truck turn-around, and concrete in the lower parking lot will be removed and disposed on site. Material will be excavated from berms along roads, the upper and lower parking lots, Cottonwood/Wilberg Mine storage yard, and the upper storage yard to use as backfill for each facility area and adjacent road cuts. Final slopes will be 2h:1v. The unpaved access road at the Waste Rock Storage area will be scarified prior to revegetation.

Compliance

The applicant adequately addresses the designs, locations, maintenance, and reclamation of Class I and Class II roads. There are no existing or proposed Class III roads at the Cottonwood/Wilberg Mine.

Large sections of the Class I and Class II road grades exceed 10 percent and were granted a construction variance by the Division on May 25, 1978.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.180 Other Transportation Facilities-(PGL)

Existing Environment and Applicant's Proposal

The coal handling circuit at the Cottonwood/Wilberg Mine includes seven conveyors which are covered to prevent wind erosion. These conveyors are regularly maintained and will be dismantled and removed from the site (page 3-57).

Compliance

The applicant commits to maintain and reclaim the conveyors so that damage to fish, wildlife, and related environmental values are prevented.

The applicant is in compliance with this section.

UMC 817.181 Support Facilities and Utility Installations-(PGL)

Existing Environment and Applicant's Proposal

The Cottonwood/Wilberg Mine has a truck loadout and scales, rock dust and storage tank, concrete storage silo, 69 KV powerlines, exhaust fans, and a power substation (pages 3-47, 48, 68 and 70). These facilities are regularly maintained and will be removed at the end of the mine life.

Compliance

The support facilities associated with the Cottonwood/Wilberg Mine will be maintained throughout the life of the facility to prevent environmental degradation. All of these facilities will be removed at the end of mining.

The applicant is in compliance with this section.

Stipulations

None.

UMC 828.00 Prime Farmland Investigation-(HS)

Existing Environment and Applicant's Proposal

The applicant on page 2-181 asserts a negative prime farmland determination within or adjacent to the proposed permit area due to: (1) absence of historical cropland land use, (2) disturbed area slopes in excess of 10 percent, and (3) absence of a developed irrigation source.

The SCS affirms a negative prime farmland determination (page 2-181A), by their finding: (1) no prime farmland soils on the disturbed area, and (2) slopes too steep for irrigation.

Compliance

On the basis of a soil survey and field review of the lands within the permit area, there are no soil map units that may be designated prime farmland by the SCS.

The applicant is in compliance with this section.

Stipulations

None.

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.

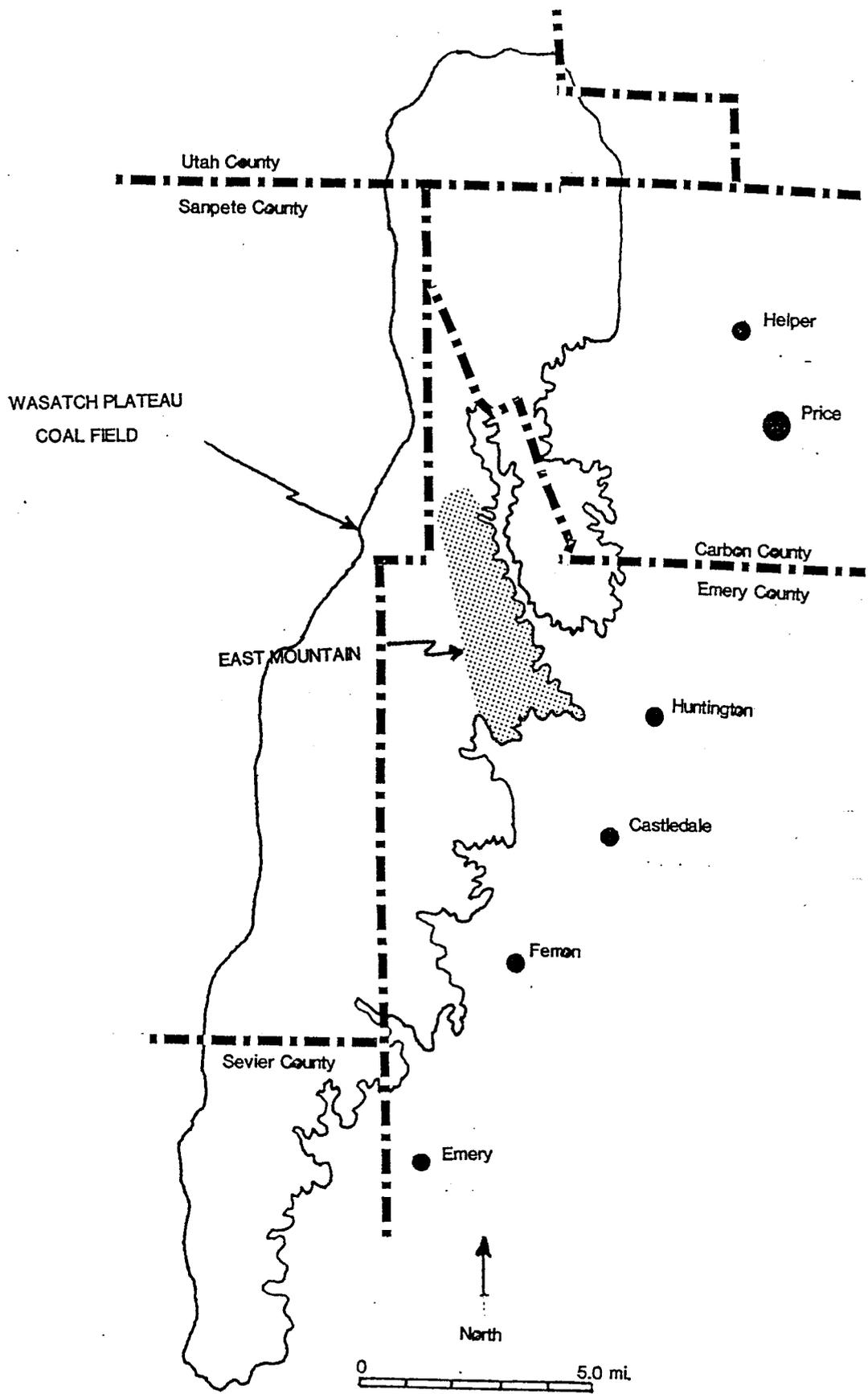


Figure 1. Wasatch Plateau Coal Field.

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	600-800	Dark-gray marine shale with thin, discontinuous layers of gray limestone and sandstone; yields water to springs locally.
		Mancos Shale		

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.

		Calcium	Chloride	Conductivity	Magnesium	Sodium	Sulfate	TDS	TSS
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 on 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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- Beaver Creek Coal Company, Huntington #4 Mine, Permit Application Package, 1985.
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- Utah Power and Light Company, Deer Creek Mine, Permit Application Package 1986.
- Utah Power and Light Company, Des-Bee-Dove Mine, Permit Application Package, 1985.
- Utah Power and Light Company, Hydrologic Monitoring Program, Annual Reports for 1979, 1982, 1983, 1984, 1985, 1986, 1987, and 1988.

**LETTERS
OF
CONCURRENCE**



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Norman H. Bangertter
Governor

Dee C. Hansen
Executive Director

Dianne R. Nielson, Ph.D.
Division Director

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

July 6, 1989

TO: Richard V. Smith, Permit Supervisor
FROM:  Joseph C. Helfrich, Regulatory Program Coordinator
RE: Five-Year Permit Renewal, Utah Power and Light Company,
Cottonwood/Wilberg Mine, ACT/015/019, Folder #3, 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 Utah Power and Light Company, or Pacificorp and associated mining entities.

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

cl
Attachment
BT37/19



State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE RESOURCES

*Very nice
A. D. Smith
CC R. D. Smith*

Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Timothy H. Provan
Division Director

1596 West North Temple
Salt Lake City, Utah 84116-3195
801-533-9333

RECEIVED
APR 28 1989
DIVISION OF
OIL, GAS & MINING

April 25, 1989

Dr. Dianne R. Nielson, Director
Utah Division of Oil, Gas & Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180

RE: Utah Power & Light's Five-Year Permit Renewal for Cottonwood/Wilberg
Coal Mine *AR*

Attn: Rick Smith and Brent Stettler

Dear Dianne:

The Division has reviewed the five-year permit renewal for Utah Power and Light Company's Cottonwood/Wilberg Coal Mine. The material presented is accurate and complete from a wildlife perspective. We have no concerns at this time relative to the permit renewal.

Thank you for an opportunity to review and provide comment.

Sincerely,

Timothy H. Provan
Timothy H. Provan
Director



State of Utah

Division of State History
(Utah State Historical Society)
Department of Community and Economic Development

Norman H. Bangertter
Governor
Max J. Evans
Director

300 Rio Grande
Salt Lake City, Utah 84101-1182
801-533-5755

April 27, 1989

RECEIVED
MAY 01 1989

DIVISION OF
OIL, GAS & MINING

Mr. Richard V. Smith
Acting Permit Supervisor
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RE: Updated Text and Maps, Five-Year Permit Renewal, Utah Power and Light Company, Cottonwood/Wilberg Mine, ACT/015/019, Folder #2, Emery County, Utah

In Reply Please Refer to Case No. K522

Dear Mr. Smith:

The Utah State Historic Preservation Office received the letter on the above referenced project on April 4, 1989. Portions of this proposed mine were surveyed for cultural resources by AERC in 1977 and resulted in the location of five prehistoric sites, one of which was considered eligible for the National Register. At the time, the archaeologist recommended that the area containing the prehistoric sites be avoided by construction activities. Similar recommendations for avoiding these sites could be made today.

Our office has no information on historic structures in the mine area which might qualify for the National Register. If any exist in the mine area that are older than 50 years of age, they may qualify for the National Register. Utah Power and Light may wish to evaluate any such structure for its National Register status, if they will be impacted by project activities.

This information is provided on request to assist the Utah Power and Light with its Section 106 responsibilities as specified in 36 CFR 800. If you have questions or need additional assistance, please contact me at (801) 533-7039.

Sincerely,

Diana Christensen
Regulation Assistance Coordinator

DC:K522/6894V OFR/NP

det/015/019 #2

SL-064900

RECEIVED
JUN 16 1989

Office of the District Mining Supervisor
2040 Administration Building
1745 West 1700 South
Salt Lake City, Utah 84104

DIVISION OF
OIL, GAS & MINING

August 17, 1982

Memorandum

To: Regional Director, Office of Surface Mining (OSM), Denver
From: District Mining Supervisor
Subject: Utah Power & Light Company, Wilberg Mine, Emery County,
Utah, Mining and Reclamation Plan

A modification dated July 1, 1982, to the subject plan was hand carried to this office on July 30, 1982, by Mary Boucek and Salley Kefer from the Division of Oil, Gas, and Mining (DOGMI), Utah. We were requested to review the one-volume document and send our comments through appropriate channels.

The document has been reviewed. Our comments follow:

This modification to the permit application is principally to make some additions to the surface plant. These additions will eventually handle the coal that will be mined from the newly acquired Federal coal lease U-47978.

The underground facilities associated with the proposed surface additions shown with this application are all located on Federal coal leases U-044025 and U-040151, which are presently being operated under the approved plans authorized by the 30 CFR 211 regulations dated May 17, 1976. The 211 regulations were amended August 22, 1978, and an updated mining and reclamation plan was submitted to OSM and DOGMI the forepart of 1981. Our review of this plan was completed on July 10, 1981.

The underground changes included in this submittal are not significant and will be handled by minor modifications to the approved plan, which directs the present mine operations.

The projected mine development into the new Federal coal lease U-044025 as shown on drawing OK-10415-WE is a major modification and is a part of the 1981 mining and reclamation plan now being reviewed by OSM and DOGMI.

The present coal handling facilities of the Wilberg mine are not adequate to handle the mined tonnages that will be required in the near future. The proposed new facilities will provide a coal handling system for both the Blind Canyon and Hiawatha seams in the Federal coal lease U-044025. This system will also have a potential of assisting in coal haulage from other Wilberg properties to the west.

This submittal is in conformance with Federal Regulations 30 CFR 211 and will not interfere with our administration of the Federal coal lease associated with the Wilberg mine. As restricted by our responsibilities we have determined that the plan is technically correct and should safely achieve maximum economic recovery of the coal reserve within the plan area.

Jackson W. Moffitt

cc: Denver
UP&L
DOGM
McKean (2)

JEMcKean:ot
1a/UPL-CSM.1

NOTICE

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) consecutive issues, and that the first publication was on the

2nd day of May, 1989

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

23rd day of May, 1989

[Signature]

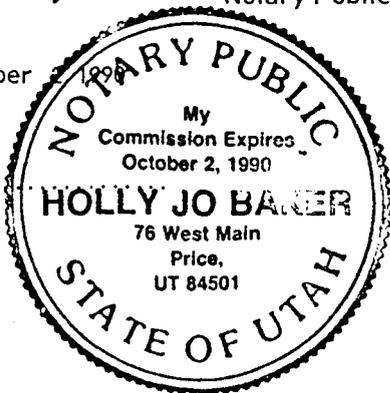
Subscribed and sworn to before me this

23rd day of May, 1989

[Signature] Notary Public.

My Commission expires October 1990
Residing at Price, Utah

Publication fee, \$ 499.20



Utah Power & Light Company, P. O. Box 899, Salt Lake City, Utah 84110, hereby announces its intent to file an application for renewal of a Coal Mining Permit for the Cottonwood/Wilberg Coal Mine with the Division of Oil, Gas and Mining under the laws of the State of Utah and the Office of Surface Mining.

A copy of the complete application is available for public inspection at the Emery County Recorder's Office, Emery County Courthouse, Castle Dale, Utah 84513.

Written comments on the application should be submitted to the State of Utah, Division of Oil, Gas and Mining, 355 W. North Temple, 3 Triad Center, Suite 350, Salt Lake City, Utah 84180-1203. Said comments must be submitted within thirty (30) days from May 24, 1989, the date of last publication of this notice.

The area to be mined is contained on the U.S.G.S. 7.5-minute "Red Point" and "Mahogany Point" quadrangle maps. A map depicting the general area of the Cottonwood/Wilberg Mine is published herewith.

Approximately 10,600 acres are contained in the permit area described as follows:

- Township 17 South, Range 6 East, SLM
Section 1: SE1/4, E1/2 SW1/4, S1/2 SE1/4 NE1/4, SE1/4 SW1/4 NE1/4;
Section 12: E1/2, E1/2 W1/2;
Section 13: E1/2, E1/2 W1/2;
Section 24: E1/2, E1/2 W1/2;
Section 25: N1/2 NE1/4, E1/2 NW1/4 SE1/4;
Township 17 South, Range 7 East, SLM
Section 6: Lots 9, 10, 11; W1/2 W1/2 SW1/4;
Section 7: Lots 1, 2, 3, 4; W1/2 NW1/4 NW1/4; SW1/4 NW1/4; S1/2;
Section 8: S1/2 SW1/4, S1/2 NW1/4 SW1/4, SW1/4 NE1/4 SW1/4, S1/2 S1/2 SE1/4, N1/2 SW1/4 SE1/4;
Section 9: S1/2 S1/2 SW1/4, SE1/4 SE1/4, S1/2 SW1/4 SE1/4, NE1/4 SW1/4 SE1/4, SE1/4 NE1/4 SE1/4;
Section 10: S1/2 SW1/4, S1/2 N1/2 SW1/4;
Section 15: N1/2, SW1/4;
Section 16: All
Section 17: All
Section 18: All
Section 19: All
Section 20: All
Section 21: All
Section 22: NW1/4, S1/2;
Section 27: NW1/4, N1/2 SW1/4, NE1/4;
Section 28: All
Section 29: All
Section 30: All
Section 31: Lot 1, E1/2, E1/2 W1/2;
Section 32: All
Section 33: N1/2, SW1/4, W1/2 SE1/4;
Section 34: S1/2 NW1/4, NW1/4 NW1/4, E1/2 SE1/4 NW1/4 NE1/4, S1/2 SE1/4 NE1/4, E1/2 NW1/4 NE1/4 SE1/4, NE1/4 NE1/4 SE1/4, N1/2 SE1/4 NE1/4 SE1/4, E1/2 NE1/4 SE1/4, NW1/4 NE1/4 SE1/4;
Section 35: NW1/4 SW1/4 SW1/4, W1/2 NE1/4 SW1/4 SW1/4, SW1/4 NW1/4 SW1/4, W1/2 NW1/4 NW1/4 SW1/4;
Township 18 South, Range 7 East, SLM
Section 4: NW1/4 NE1/4, N1/2 NW1/4;
Section 5: N1/2 NE1/4, NW1/4;
Township 17 South, Range 6 East, SLM
Section 25: NE1/4 SE1/4, SE1/4 NE1/4, E1/2 SW1/4 NE1/4;
Township 17 South, Range 7 East, SLM
Section 10: SW1/4 SE1/4, S1/2 SE1/4 SE1/4;
Section 11: S1/2 SW1/4 SW1/4;
Section 21 All

NOTICE

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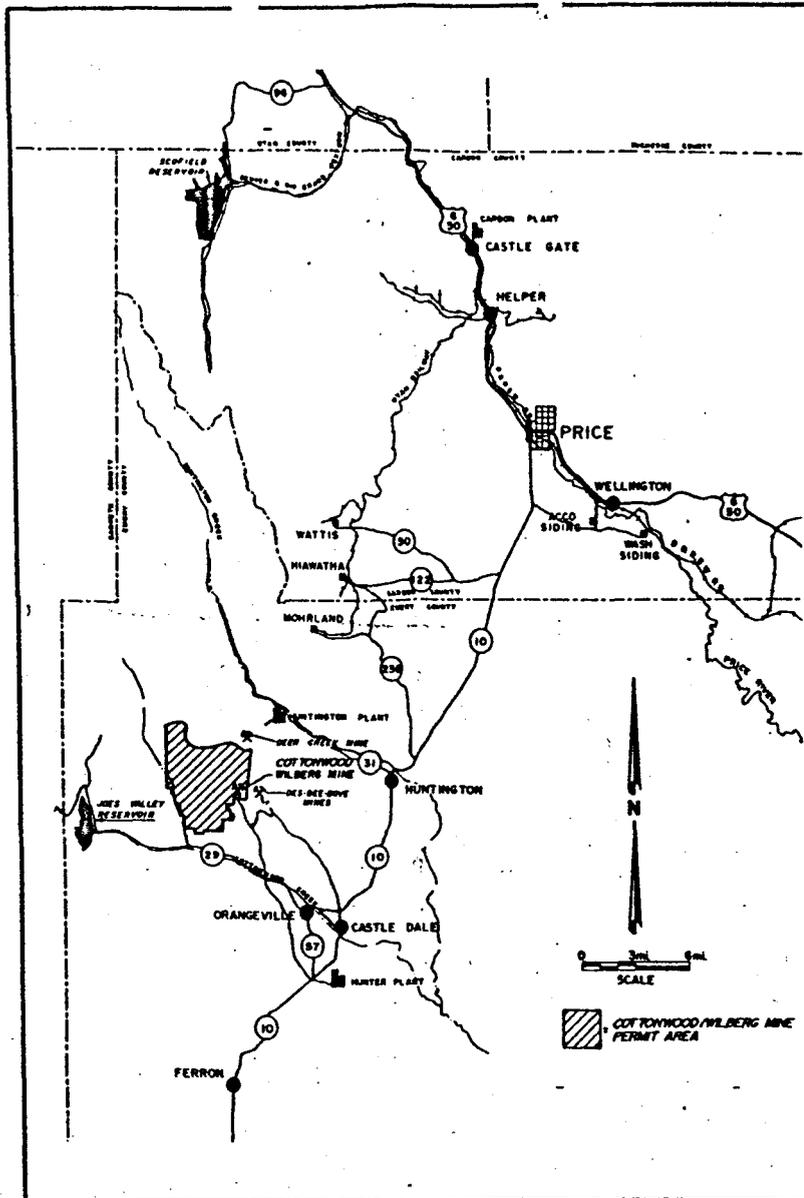
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- Section 13: E1/2, E1/2 W1/2;
- Section 24: E1/2, E1/2 W1/2;
- Section 25: N1/2 NE1/4, E1/2 NW1/4 SE1/4;
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- Section 6: Lots 9, 10, 11; W1/2 W1/2 SW1/4;
- Section 7: Lots 1, 2, 3, 4; W1/2 NW1/4 NW1/4; SW1/4 NW1/4; S1/2;
- Section 8: S1/2 SW1/4, S1/2 NW1/4 SW1/4, SW1/4 NE1/4 SW1/4, S1/2 S1/2 SE1/4, N1/2 SW1/4 SE1/4;
- Section 9: S1/2 S1/2 SW1/4, SE1/4 SE1/4, S1/2 SW1/4 SE1/4, NE1/4 SW1/4 SE1/4, SE1/4 NE1/4 SE1/4;
- Section 10: S1/2 SW1/4, S1/2 N1/2 SW1/4;
- Section 15: N1/2, SW1/4;
- Section 16: All
- Section 17: All
- Section 18: All
- Section 19: All
- Section 20: All
- Section 21: All
- Section 22: NW1/4, S1/2;
- Section 27: NW1/4, N1/2 SW1/4, NE1/4;
- Section 28: All
- Section 29: All
- Section 30: All
- Section 31: Lot 1, E1/2, E1/2 W1/2;
- Section 32: All
- Section 33: N1/2, SW1/4, W1/2 SE1/4;
- Section 34: S1/2 NW1/4, NW1/4 NW1/4, E1/2 SE1/4 NW1/4 NE1/4, S1/2 SE1/4 NE1/4, E1/2 NW1/4 NE1/4 SE1/4, NE1/4 NE1/4 SE1/4, N1/2 SE1/4 NE1/4 SE1/4, E1/2 NE1/4 SE1/4, NW1/4 NE1/4 SE1/4;
- Section 35: NW1/4 SW1/4 SW1/4, W1/2 NE1/4 SW1/4 SW1/4, SW1/4 NW1/4 SW1/4, W1/2 NW1/4 NW1/4 SW1/4;
- Township 18 South, Range 7 East, SLM**
- Section 4: NW1/4 NE1/4, N1/2 NW1/4;
- Section 5: N1/2 NE1/4, NW1/4;
- Township 17 South, Range 6 East, SLM**
- Section 25: NE1/4 SE1/4, SE1/4 NE1/4, E1/2 SW1/4 NE1/4;
- Township 17 South, Range 7 East, SLM**
- Section 10: SW1/4 SE1/4, S1/2 SE1/4 SE1/4;
- Section 11: S1/2 SW1/4 SW1/4;
- Section 21 All



- Section 22 N1/2NW1/4
- Section 27 N1/2NW1/4
- Section 28 N1/2N1/2
- Section 29 NE1/4NE1/4
- Township 17 South, Range 7 East, S.L.M. Utah, containing 1720 acres
- Lease No. U-044025
- Issued to Cooperative Security Corp. 8/1/60
- Section 27 NW1/4NE1/4
- Township 17 South, Range 7 East, S.L.M. Utah, containing 40 acres
- In addition, Federal Coal Lease U-47978 issued to Utah Power & Light Company October 1, 1981.
- Township 17 South, Range 7 East, S.L.M. Utah
- Section 27 S1/2NW1/4, N1/2SW1/4
- Section 28 S1/2N1/2, S1/2
- Section 29 S1/2N1/2, S1/2
- Section 30 Lot 4, SE1/4NE1/4 NE1/4SE1/4, S1/2SE1/4
- Section 31 Lot 1, E1/2
- Section 32 All
- Section 33 N1/2, SW1/4, W1/2SE1/4
- Section 34 NW1/4NW1/4, S1/2NW1/4
- Township 18 South, Range 7 East, S.L.M.
- Section 4 Lots 2 thru 4
- Section 5 Lots 1 thru 4, S1/2NW1/4

1-25
Revised 6/6/89

Section 14: W1/2 W1/2 NW1/4, W1/2 E1/2 W1/2 NW1/4,
W1/2 W1/2 W1/2 SW1/4;
Section 15: SE1/4;
Section 22: NE1/4;
Beginning at the SE corner at NE1/4 SE1/4 Section 25,
Township 17 South, Range 6 East, SLM, thence North 160
rods, West 116 rods to center line of Cottonwood Creek;
thence Southerly along center line of said creek to a point 84
West of the beginning; thence East 84 rods to the
beginning.

The permit area involves all or part of the following federal
and fee coal leases:

Lease No. SL-064900
Issued to Cyrus Wilberg 2/3/45
Section 22 SE1/4SW1/4, SW1/4SE1/4, NE1/4SW1/4,
NW1/4SE1/4
Township 17 South, Range 7 East, S.L.M. Utah, containing
160 acres

Lease No. U-1358
Issued to Castle Valley Mining Co. 8/1/67
Section 22 S1/2NW1/4, W1/2SW1/4, E1/2SE1/4
Section 27 E1/2NE1/4
Township 17 South, Range 7 East, S.L.M. Utah, containing
320 acres

Lease No. SL-070645, U-02292
Issued to Clara Howard Miller 4/1/52
Section 4 SW1/4SE1/4, S1/2SW1/4
Section 5 SE1/4SW1/4, S1/2SE1/4
Section 8 E1/2, E1/2W1/2
Section 9 All
Section 10 W1/2
Section 15 N1/2
Section 16 N1/2
Section 17 NE1/4, E1/2NW1/4
Township 17 South, Range 7 East, S.L.M. Utah, containing
2560 acres.

Lease No. U-084923
Issued to Malcom N. McKinnon 8/1/64
Section 4 Lots 2, 3, 4, 5, 6, 7, 10, 11, 12, NW1/4SE1/4,
SW1/4
Section 5 Lots 1 thru 12, N1/2S1/2, SW1/4SW1/4
Section 6 Lots 1 thru 11, SE1/4
Section 7 Lots 1 thru 4, E1/2
Section 8 W1/2W1/2
Section 18 Lot 1 and 2, N1/2
Section 17 W1/2NW1/4

Township 17 South, Range 7 East, S.L.M. Utah, containing
2252.42 acres

Lease No. U-084924
Issued to Malcolm N. McKinnon 8/1/64
Section 1 Lots 1, 2, 3, S1/2NE1/4 SE1/4NW1/4, E1/2SW1/4,
SE1/4

Section 12 E1/2, E1/2W1/2
Section 13 NE1/4, E1/2NW1/4
Township 17 South, Range 6 East, S.L.M. Utah, containing
1211.48 acres

Lease No. U-083066
Issued to Cooperative Security Corp. 3/1/62
Section 13 E1/2SW1/4, SE1/4
Section 24 E1/2W1/2, E1/2
Section 25 N1/2NE1/4
Township 17 South, Range 6 East, S.L.M. Utah
Section 17 SW1/4, W1/2SE1/4
Section 18 Lots 3 and 4, SE1/4
Section 19 Lots 1, 2, 3, 4, E1/2
Section 20 W1/2, W1/2E1/2
Section 29 NW1/4NE1/4, N1/2NW1/4
Section 30 Lots 1, 2, 3, N1/2NE1/4, SW1/4NE1/4,
W1/4SE1/4

wnship 17 South, Range 7 East, S.L.M. Utah, containing
2400 acres

Lease No. U-040151
Issued to Cooperative Security Corp. 3/1/62
Section 15 SW1/4
Section 16 S1/2
Section 17 E1/2SE1/4
Section 20 E1/2E1/2
Section 21 All

Containing 3347.31 acres

Owners of Coal to be Mine Other than the United States

Description of Land Owner

SE1/4— Section 10, The Estate of Malcolm McKinnon

W1/2NW1/4— Section 14, c/o Frank Armstrong 1300

Walker Bank Bldg.

S1/2SW1/4SW1/4— Section 11, Salt Lake City, Utah
84111

All T17S, R7E, S.L.M.

Surface rights and coal leased to Utah Power & Light
Company

SE1/4— Section 15, Cooperative Security Corp 115 East
South Temple

NE1/4— Section 22, Salt Lake City, Utah 84111

All T17S, R7E, S.L.M.

Also:

Beginning at the SE corner of NE1/4SE1/4 Section 25,
T17S, R6E, SLM, thence N 160 rods, W 116 rods to center line
of Cottonwood Creek; thence Southerly along center line of
said creek to a point 84 rods West of the beginning; thence
East 84 rods to the beginning.

Surface rights and coal leased to Utah Power & Light
Company

SW1/4 (west of the Deer Creek Fault)— Section 14, Utah
Power & Light Company, P. O. Box 899, Salt Lake City, Utah
84110

All T17S, R7E, S.L.M.

Additional Lands to be Affected by Mining

BLM R/W grant U-37641 utilized for sewer line and
absorption field. 3.7 acres located in the North Half of the
Northeast Quarter of Section 34, T17S, R7E, SLM.

BLM R/W grant U-37642 utilized for waste rock disposal.
48.62 acres located in the East Half of Section 34 and the
Southwest Quarter of Section 35, T17S, R7E, SLM.

Published in the Emery County Progress May 2, 9, 16 and
23.



1-26
Revised 6/16/89

RECLAMATION AGREEMENT

(C O A L)

CONTENTS:

Reclamation Agreement

Exhibit "A"
Surface Disturbance

Exhibit "B"
Bonding Agreement
Surety Bond
Collateral Bond

Exhibit "C"
Liability Insurance

Exhibit "D"
Stipulation to Revise Reclamation Agreement

Affidavits of Qualification

Power of Attorney

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

COAL RECLAMATION AGREEMENT
--oo00oo--

For the purposes of this RECLAMATION AGREEMENT the terms below are defined as follows:

"PERMIT" (Mine Permit No.) ACT/015/019 (County) Emery

"MINE" (Name of Mine) Cottonwood/Wilberg

"OPERATOR" (Company or Name) Utah Power & Light Company - Mining Division
(Address) Box 310
Huntington, Utah 84528

"OPERATOR'S REGISTERED AGENT" (Name) J. Brett Harvey - Vice President - Mining
(Address) 324 South State Street
(Phone) Salt Lake City, Utah 84140
*801) 220-4614

"COMPANY OFFICERS": J. Brett Harvey
Dan A. Baker

"BOND TYPE" (Form of Bond) Corporate Surety
"BOND" (Bond Amount-Dollars) \$1,224,000.00
(Year-Dollars) 1988 - \$1,724,000.00

INSTITUTION
POLICY OR ACCOUNT NUMBER American Casualty Company - No. 927-21-38

"LIABILITY INSURANCE" (Exp.) December 24, 1989
(Insurance Company) Associated Electric & Gas Insurance Service Limited

"STATE": Utah (Department of Natural Resources)
"DIVISION": Division of Oil, Gas and Mining
"DIVISION DIRECTOR" Dianne R. Nielson

EXHIBITS:

		Revision Dates		
"SURFACE DISTURBANCE"	Exhibit "A"	_____	_____	_____
"BONDING AGREEMENT"	Exhibit "B"	_____	_____	_____
"LIABILITY INSURANCE"	Exhibit "C"	_____	_____	_____
"STIPULATION TO CHANGE BOND"	Exhibit "D"	_____	_____	_____

RECLAMATION AGREEMENT

This RECLAMATION AGREEMENT (hereinafter referred to as "Agreement") is entered into by the Operator.

WHEREAS, on July 6, _____, 19 89, the Division approved the Permit Application Package, hereinafter "PAP", submitted by Utah Power & Light Company, hereinafter "Operator"; and

WHEREAS, prior to issuance of a permit to conduct mining and reclamation operations on the property described in the PAP, hereinafter "Property", the Operator is obligated by Title 40-10-1, et seq., Utah Code Annotated (1953, as amended), hereinafter "Act", to file with the Division a bond ensuring the performance of the reclamation obligations in the manner and by the standards set forth in the PAP, the Act, and the State of Utah Division of Oil, Gas and Mining Rules pertaining to Coal Mining and Reclamation Activities, hereinafter "Rules"; and

WHEREAS, the Operator is ready and willing to file the bond in the amount and in a form acceptable to the Division and to perform all obligations imposed by the Division relating to the reclamation of the Property; and

WHEREAS, the Division is ready and willing to issue the subject a mining and reclamation permit upon acceptance and approval of the bond.

NOW, THEREFORE, the Division and the Operator agree as follows:

1. The provisions of the Act and the Rules are incorporated by reference herein and hereby made a part of this Agreement. Provisions of the Act or Rules shall supercede conflicting provisions of this Agreement.

RECLAMATION AGREEMENT

2. The Operator shall provide a legal description of the property including the number of acres approved by the Division to be disturbed by surface mining and reclamation operations during the permit period. The description is attached as Exhibit "A", and is incorporated by reference and shall be referred to as the "Surface Disturbance".
3. The Operator shall provide a bond to the Division in the form and amount acceptable to the Division ensuring the performance of the reclamation obligations in the manner and by the standards set forth in the PAP, the Act and the Rules. Said bond is attached as Exhibit "B" and is incorporated by reference.
4. The Operator shall maintain in full force and effect the public liability insurance policy submitted as part of the permit application. The Division shall be listed as an additional insured on said policy.
5. In the event that the Surface Disturbance is increased through expansion of the coal mining and reclamation operations or decreased through partial reclamation, the Division shall adjust the bond as appropriate.
6. The Operator does hereby jointly and severally agree to indemnify and hold harmless the State of Utah and the Division from any claim, demand, liability, cost, charge, or suit initiated by a third party as a result of the Operator or Operator's agent or employees failure to abide by the terms and conditions of the approved PAP and this Agreement.

RECLAMATION AGREEMENT

7. The terms and conditions of this Agreement are non-cancellable until such time as the Operator has satisfactorily, as determined by the Division, reclaimed the Surface Disturbance in accordance with the approved PAP, the Act, and the Rules. Notwithstanding the above, the Division may direct, or the Operator may request and the Division may approve, a modification to this Agreement.
8. The Operator may, at any time, submit a request to the Division to substitute the bonding method. The Division may approve the substitution if the bond meets the requirements of the Act and the Rules, but no bond shall be released until the Division has approved and accepted the replacement bond.
9. Any revision in the Surface Disturbance, the bond amount, the bond type, the liability insurance amount coverage, and/or the liability insurance company, or other revisions affecting the terms and conditions of this Agreement shall be submitted on the form entitled "Stipulation to Revise Reclamation Agreement" and shall be attached hereto as Exhibit "D".
10. This Agreement shall be governed and construed in accordance with the laws of the State. The Operator shall be liable for all costs required to comply with this agreement, including any attorney fees.
11. Any breach of the provisions of this Agreement, the Act, the Rules, or the PAP may, at the discretion of the Division, result in an order to cease coal mining and reclamation operations, revocation of the Operator's permit to conduct coal mining and reclamation operations and/or forfeiture of the bond.

RECLAMATION AGREEMENT

- 12. In the event of forfeiture, the Operator shall be liable for additional costs in excess of the bond amount which are required to comply with this Agreement. Any excess monies resulting from the forfeiture of the bond amount upon compliance with this contract shall be refunded to the appropriate party.
- 13. Each signatory below represents that he/she is authorized to execute this Agreement on behalf of the named party. Proof of such authorization is provided on a form acceptable to the Division and is attached hereto.

SO AGREED this 6th day of July, 19 89

STATE OF UTAH:

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

OPERATOR:

[Signature]
Company Officer - Position
Vice President, Fuel Resources

[Signature]
Company Officer - Position

NOTE: An Affidavit of Qualification must be completed and attached to this form for each authorized agent or officer. Where one signs by virtue of Power of Attorney for a company, such Power of Attorney must be filed with this Agreement. If the principal is a corporation, the Agreement shall be executed by its duly authorized officer.

EXHIBIT "A"
SURFACE DISTURBANCE
LEGAL DESCRIPTION

Exhibit "A" - SURFACE DISTURBANCE
August 1988

Permit Number ACT/015/019
Effective Date 7/6/89

SURFACE DISTURBANCE

--oo00oo--

In accordance with the RECLAMATION AGREEMENT, the OPERATOR intends to conduct coal mining and reclamation activities on or within the surface DISTURBANCE as described hereunder:

Total acres of SURFACE DISTURBANCE 42.5

Legal Description of SURFACE DISTURBANCE:

EXHIBIT "B"
BONDING AGREEMENT

Surety Bond
Collateral Bond

EXHIBIT "B"
SURETY BOND
(FEDERAL COAL)

August 1988
Exhibit "B" - BONDING AGREEMENT
SURETY BOND

Permit Number ACT/015/019
Expiration Date _____
Wilberg-Cottonwood

(FEDERAL COAL)
SURETY BOND
--oo00oo--

THIS SURETY BOND entered into and by and between the undersigned OPERATOR, and SURETY COMPANY, hereby jointly and severally bind ourselves, our heirs, administrators, executors, successors and assigns unto the State of Utah, Division of Oil, Gas and Mining, and, the U.S. Department of Interior, Office of Surface Mining Reclamation and Enforcement (OSMRE) in the penal sum of (\$ 1,294,522.00) (Surety Bond Amount) for the timely performance of reclamation responsibilities of the surface disturbance described in Exhibit "A" of this Reclamation Agreement.

This SURETY BOND shall remain in effect until all applicable rules and the OPERATOR's reclamation obligation have been met and released by the Division of Oil, Gas and Mining.

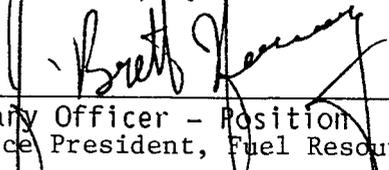
Terms for release or adjustment of this BOND are as written and agreed to by the DIVISION and the OPERATOR in the RECLAMATION AGREEMENT incorporated by reference herein, to which this SURETY AGREEMENT has been attached as Exhibit "B".

August 1988
Exhibit "B" - BONDING AGREEMENT
SURETY BOND

So agreed this 3rd day of August, 19 89.

FOR THE OPERATOR:

Utah Power & Light Company
Operator (Company)

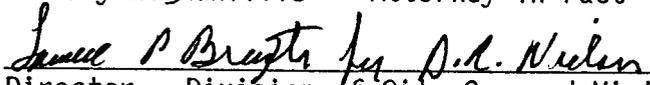

Company Officer - Position
Vice President, Fuel Resources

FOR THE SURETY COMPANY:

American Casualty Company
Surety (Company)


Company Officer - Position
Gary W. Manville Attorney-in-Fact

ACCEPTED BY THE STATE OF UTAH:


Director - Division of Oil, Gas and Mining

NOTE: An Affidavit of Qualification must be completed and attached to this form for each authorized agent or officer. Where one signs by virtue of Power of Attorney for a company, such Power of Attorney must be filed with this Agreement. If the principal is a corporation, the Agreement shall be executed by its duly authorized officer.

American Casualty Company of Reading, Pennsylvania



Offices/Chicago, Illinois

POWER OF ATTORNEY APPOINTING INDIVIDUAL ATTORNEY-IN-FACT

Know All Men by these Presents, That AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA, a corporation duly organized and existing under the laws of the Commonwealth of Pennsylvania, and having its principal office in the City of Chicago, and State of Illinois, does hereby make, constitute and appoint Edward B. Moreton, Edward F. Folland, L. Kent Bills, Gary W. Manville, Individually

of Salt Lake City, Utah

its true and lawful Attorney-in-Fact with full power and authority hereby conferred to sign, seal and execute in its behalf bonds, undertakings and other obligatory instruments of similar nature as follows:

Without Limitations

and to bind AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA thereby as fully and to the same extent as if such instruments were signed by the duly authorized officers of AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA and all the acts of said Attorney, pursuant to the authority hereby given are hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the following By-Law duly adopted by the Board of Directors of the Company:

"Article VI — Execution of Obligations and Appointment of Attorney-in-Fact

Section 2. Appointment of Attorney-in-fact. The President or a Vice President may, from time to time, appoint by written certificates attorneys-in-fact to act in behalf of the Company in the execution of policies of insurance, bonds, undertakings and other obligatory instruments of like nature. Such attorneys-in-fact, subject to the limitations set forth in their respective certificates of authority shall have full power to bind the Company by their signature and execution of any such instruments and to attach the seal of the Company thereto. The President or any Vice President or the Board of Directors may at any time revoke all power and authority previously given to any attorney-in-fact."

This Power of Attorney is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of the Company at a meeting duly called and held on the 11th day of November, 1966:

"Resolved, that the signature of the President or a Vice President and the seal of the Company may be affixed by facsimile on any power of attorney granted pursuant to Section 2 of Article VI of the By-Laws, and the signature of the Secretary or an Assistant Secretary and the seal of the Company may be affixed by facsimile to any certificate of any such power and any such power or certificate bearing such facsimile signature and seal shall be valid and binding on the Company. Any such power so executed and sealed and certified by certificate so executed and sealed shall, with respect to any bond or undertaking to which it is attached, continue to be valid and binding on the Company."

In Witness Whereof, AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA has caused these presents to be signed by its Vice President and its corporate seal to be hereto affixed this 18th day of January, 1983.



AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA

State of Illinois } ss
County of Cook }

[Signature]
R. J. Wall
Vice President.

On this 18th day of January, 1983, before me personally came

R. J. Wall to me known, who, being by me duly sworn, did depose and say: that he resides in the Village of Western Springs State of Illinois; that he is a Vice-President of AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA, the corporation described in and which executed the above instrument; that he knows the seal of said Corporation; that the seal affixed to the said instrument is such corporate seal; that it was so affixed pursuant to authority given by the Board of Directors of said corporation and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said corporation.



[Signature]
Leslie A. Smith
Notary Public.

My Commission Expires November 12, 1986

P. F. Granahan

CERTIFICATE

I, P. F. Granahan, Assistant Secretary of AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA, do certify that the Power of Attorney herein above set forth is still in force, and further certify that Section 2 of Article VI of the By-Laws of the Company and the Resolution of the Board of Directors, set forth in said Power of Attorney are still in force. In testimony whereof I have hereunto subscribed my name and affixed the seal of the said Company this 15th day of June, 1984.



[Signature]
P. F. Granahan
Assistant Secretary.

(Revised January 1984)

Bond Number 924 98 19Permit Number ACT/015/019Mine Name WILBERG

STATE OF UTAH
 DEPARTMENT OF NATURAL RESOURCES
 DIVISION OF OIL, GAS AND MINING
 4241 State Office Building
 Salt Lake City, Utah 84114

THE MINED LANDS RECLAMATION ACT

BOND

The undersigned UTAH POWER & LIGHT COMPANY
 as principal, and AMERICAN CASUALTY COMPANY as
 surety, hereby jointly and severally bind ourselves, our heirs, administrators,
 executors, successors and assigns unto the State of Utah, Division of Oil, Gas
 and Mining, and the U. S. Department of the Interior, Office of Surface Mining
 in the penal sum of (one million two hundred ninety four thousand five hundred and two)
dollars (\$ 1,294,522.00). Such sum shall be payable to
 one, but not both, of the above-named agencies.

The principal estimated in a "Notice of Intention to Commence Mining
 Operations and a Mining and Reclamation Plan," filed with the Division of Oil,
 Gas and Mining on the 20th day of March,
 19 81, that 42.5 acres of land will be disturbed by this mining
 operation in the State of Utah. A description of the disturbed land is
 attached hereto as Exhibit "A."

When the Division has determined that the principal has satisfactorily
 reclaimed the above-mentioned lands affected by mining in accordance with the
 approved Mining and Reclamation Plan and has faithfully performed all
 requirements of the Mined Land Reclamation Act, and complied with the Rules
 and Regulations adopted in accordance therewith, then this obligation shall be
 void; otherwise it shall remain in full force and effect until the reclamation
 is completed as outlined in the approved Mining and Reclamation Plan.

If the approved plan provides for reclamation of the land affected on a
 piecemeal or cyclic basis, and the land is reclaimed in accordance with such
 plan, then this bond may be reduced periodically.

In the converse, if the plan provides for a gradual increase in the area
 of the land affected or increased reclamation work, then this bond may
 accordingly be increased with the written approval of the surety company.

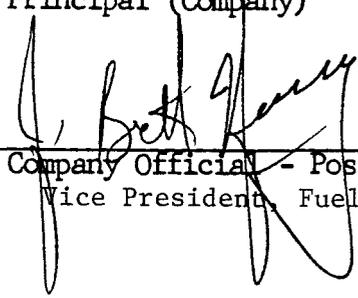
The Division shall only accept the bond of a surety company if the bond is
 noncancellable by the surety at any time for any reason including, but not
 limited to nonpayment of premium or bankruptcy of the permittee during the
 period of liability.

NOTE: Where one signs by virtue of Power of Attorney for a surety company, such Power of Attorney must be filed with this bond. If the principal is a corporation, the bond shall be executed by its duly authorized officers with the seal of the corporation affixed.

UTAH POWER & LIGHT COMPANY

Principal (Company)

By


Company Official - Position
Vice President, Fuel Resources

Date: June 15th, 1984

AMERICAN CASUALTY COMPANY

Surety (Company)

By


Official of Surety - Position
Gary W. Manville Attorney-in-Fact

DATE: June 15th, 1984

BOARD:

DATE: _____

EXHIBIT "C"
LIABILITY INSURANCE

August 1988

CERTIFICATE OF LIABILITY INSURANCE

Issued To:
State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
--oo00oo--

THIS IS TO CERTIFY THAT:

Associated Electric & Gas Insurance Services Limited

(Name of Insurance Company)

Argus Insurance Building, 12 Wesley Street, PO Box HM1064

(Home Office Address of Insurance Company) Hamilton, Bermuda

HAS ISSUED TO:

Utah Power & Light Company

(Name of Permit Applicant)

Cottonwood/Wilberg

(Mine Name)

ACT/015/019

(Permit Number)

CERTIFICATE OF INSURANCE:

XL0296A88

(Policy Number)

December 24, 1989

(Effective Date)

UNDER THE FOLLOWING TERMS AND CONDITIONS:

Per UMC/SMC Part 800.60 Terms and Conditions for Liability Insurance;

- A. The Division shall require the applicant to submit as part of its permit application a certificate issued by an insurance company authorized to do business in the state of Utah certifying that the applicant has a public liability insurance policy in force for the surface coal mining and reclamation operations for which the permit is sought. Such policy shall provide for personal injury and property damage protection in an amount adequate to compensate any persons injured or property damaged as a result of the surface coal mining and reclamation operations, including the use of explosives and who are entitled to compensation under the applicable provisions of state law. Minimum insurance coverage for bodily injury and property damage shall be \$300,000 for each occurrence and \$500,000 aggregate.

August 1988
CERTIFICATE OF LIABILITY INSURANCE

- B. The policy shall be maintained in full force during the life of the permit or any renewal thereof, including the liability period necessary to complete all reclamation operations under this chapter.

- C. The policy shall include a rider requiring that the insurer notify the Division whenever substantive changes are made in the policy including any termination or failure to renew.

IN ACCORDANCE WITH THE ABOVE TERMS AND CONDITIONS, and the Utah Code Annotated 40-10-1 et seq., the Insurance Company hereby attests to the fact that coverage for said Permit Application is in accordance with the requirements of the State of Utah and agrees to notify the Division of Oil, Gas and Mining in writing of any substantive change, including cancellation, failure to renew, or other material change. No change shall be effective until at least thirty (30) days after such notice is received by the Division. Any change unauthorized by the Division is considered breach of the RECLAMATION AGREEMENT and the Division may pursue remedies thereunder.

UNDERWRITING AGENT:

Sandra A. Johnson
(Agent's Name)

(201) 915-7216
(Phone)

AEGIS Insurance Services Inc
(Company Name)

Harborside, Financial Center,
(Mailing Address) 700 Plaza Two

Jersey City, New Jersey 07311-3994
(City, State, Zip Code)

August 1988
CERTIFICATE OF LIABILITY INSURANCE

The undersigned affirms that the above information is true and complete to the best of his or her knowledge and belief, and that he or she is an authorized representative of the above-named insurance company. (An Affidavit of Qualification must be completed and attached to this form for each authorized agent or officer.)

6/26/89 Sandra A. Johnson
(Date, Signature and Title of Authorized Agent of Insurance Company)
Sandra A. Johnson (Assistant Vice President)

Signed and sworn before me by Sandra Jackson

this 28th day of June, 19 89.

Sandra Jackson
(Signature)

My Commission Expires: July 29, 1990
(Date)

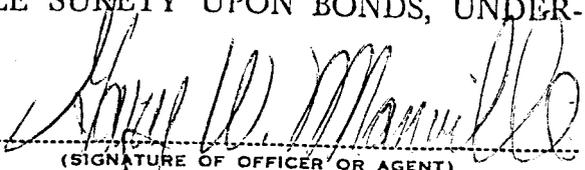
AFFIDAVITS OF QUALIFICATION

AFFIDAVIT OF QUALIFICATION
FOR SURETY COMPANIES

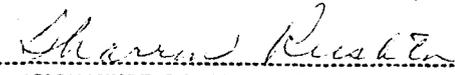
STATE OF UTAH }
COUNTY OF SALT LAKE } SS

..... Gary W. Manville BEING FIRST DULY SWORN, ON OATH DE-
POSES AND SAYS THAT HE IS THE ATTORNEY-IN-FACT OF SAID COMPANY,
(OFFICER OR AGENT)
AND THAT HE IS DULY AUTHORIZED TO EXECUTE AND DELIVER THE
FOREGOING OBLIGATIONS: THAT SAID COMPANY IS AUTHORIZED TO EXE-
CUTE THE SAME AND HAS COMPLIED IN ALL RESPECTS WITH THE LAWS OF
UTAH IN REFERENCE TO BECOMING SOLE SURETY UPON BONDS, UNDER-
TAKINGS AND OBLIGATIONS.

SUBSCRIBED AND SWORN TO BE-
FORE ME, THIS 3rd DAY OF
..... August , A.D., 19..... 89


.....
(SIGNATURE OF OFFICER OR AGENT)

649 East South Temple
Salt Lake City, Utah 84102
.....
(RESIDENCE)


.....
(SIGNATURE OF NOTARY PUBLIC)

(SEAL) Sharron Rushton
MY COMMISSION EXPIRES:

(SURETY SEAL)

..... July 1, 1991
649 East South Temple
Salt Lake City, Utah 84102

(THIS FORM REQUIRED TO BE FILLED
OUT BY SECTION 31-24-3, UCA 1953)

POWER OF ATTORNEY



For All the Commitments You Make[®]
Offices/Chicago, Illinois

POWER OF ATTORNEY APPOINTING INDIVIDUAL ATTORNEY-IN-FACT

Know All Men by these Presents, That AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA, a corporation duly organized and existing under the laws of the Commonwealth of Pennsylvania, and having its principal office in the City of Chicago, and State of Illinois, does hereby make, constitute and appoint Edward B. Moreton, Edward F. Folland,

L. Kent Bills, Gary W. Manville, Joyce R. Hartley, Individually

of Salt Lake City, Utah

its true and lawful Attorney-in-Fact with full power and authority hereby conferred to sign, seal and execute in its behalf bonds, undertakings and other obligatory instruments of similar nature

- In Unlimited Amounts -

and to bind AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA thereby as fully and to the same extent as if such instruments were signed by the duly authorized officers of AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA and all the acts of said Attorney, pursuant to the authority hereby given are hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the following By-Law duly adopted by the Board of Directors of the Company:

"Article VI— Execution of Obligations and Appointment of Attorney-in-Fact

Section 2. Appointment of Attorney-in-fact. The President or Vice President may, from time to time, appoint by written certificates attorneys-in-fact to act in behalf of the Company in the execution of policies of insurance, bonds, undertakings and other obligatory instruments of like nature. Such attorneys-in-fact, subject to the limitations set forth in their respective certificates of authority, shall have full power to bind the Company by their signature and execution of any such instruments and to attach the seal of the Company thereto. The President or any Vice President or the Board of Directors may at any time revoke all power and authority previously given to any attorney-in-fact."

This Power of Attorney is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of the Company at a meeting duly called and held on the 11th day of November, 1966:

"Resolved, that the signature of the President or a Vice President and the seal of the Company may be affixed by facsimile on any power of attorney granted pursuant to Section 2 of Article VI of the By-Laws, and the signature of the Secretary or an Assistant Secretary and the seal of the Company may be affixed by facsimile to any certificate of any such power, and any power or certificate bearing such facsimile signatures and seal shall be valid and binding on the Company. Any such power so executed and sealed and certified by certificate so executed and sealed shall, with respect to any bond or undertaking to which it is attached, continue to be valid and binding on the Company."

In Witness Whereof, AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA has caused these presents to be signed by its Vice President and its corporate seal to be hereto affixed this 20th day of July, 1987.

State of Illinois }
County of Cook | ss



AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA

J. E. Purtell
J. E. Purtell Vice President.

On this 20th day of July, 1987, before me personally came J. E. Purtell, to me known, who, being by me duly sworn, did depose and say: that he resides in the Village of Glenview, State of Illinois; that he is a Vice-President of AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA, the corporation described in the which executed the above instrument; that he knows the seal of said Corporation; that the seal affixed to the said instrument is such corporate seal; that it was so affixed pursuant to authority given by the Board of Directors of said corporation and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said corporation.



Leslie A. Smith
Leslie A. Smith Notary Public.

CERTIFICATE My Commission Expires November 12, 1990

I, Robert E. Ayo, Assistant Secretary of AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA, do certify that the Power of Attorney herein above set forth is still in force, and further certify that Section 2 of Article VI of the By-Laws of the Company and the Resolution of the Board of Directors, set forth in said Power of Attorney are still in force. In testimony whereof I have hereunto subscribed my name and affixed the seal of the said Company this 3rd day of August, 1989.



Robert E. Ayo
Robert E. Ayo Assistant Secretary.