

UTAH DIVISION OF OIL, GAS AND MINING  
STATE DECISION DOCUMENT

CONSOLIDATION COAL COMPANY  
EMERY DEEP MINE  
INCIDENTAL BOUNDARY CHANGE

Emery County, Utah  
C/015/0015

March 16, 2007

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  - OSMR, Mine Plan Modification Determination – October 20, 2006
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- \* AVS Memo - Section 510(c) finding, dated March 15, 2007

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Refer to Record No. 0012 Date 03/16/2007

In C/015/0015 Outgoing  
For additional information

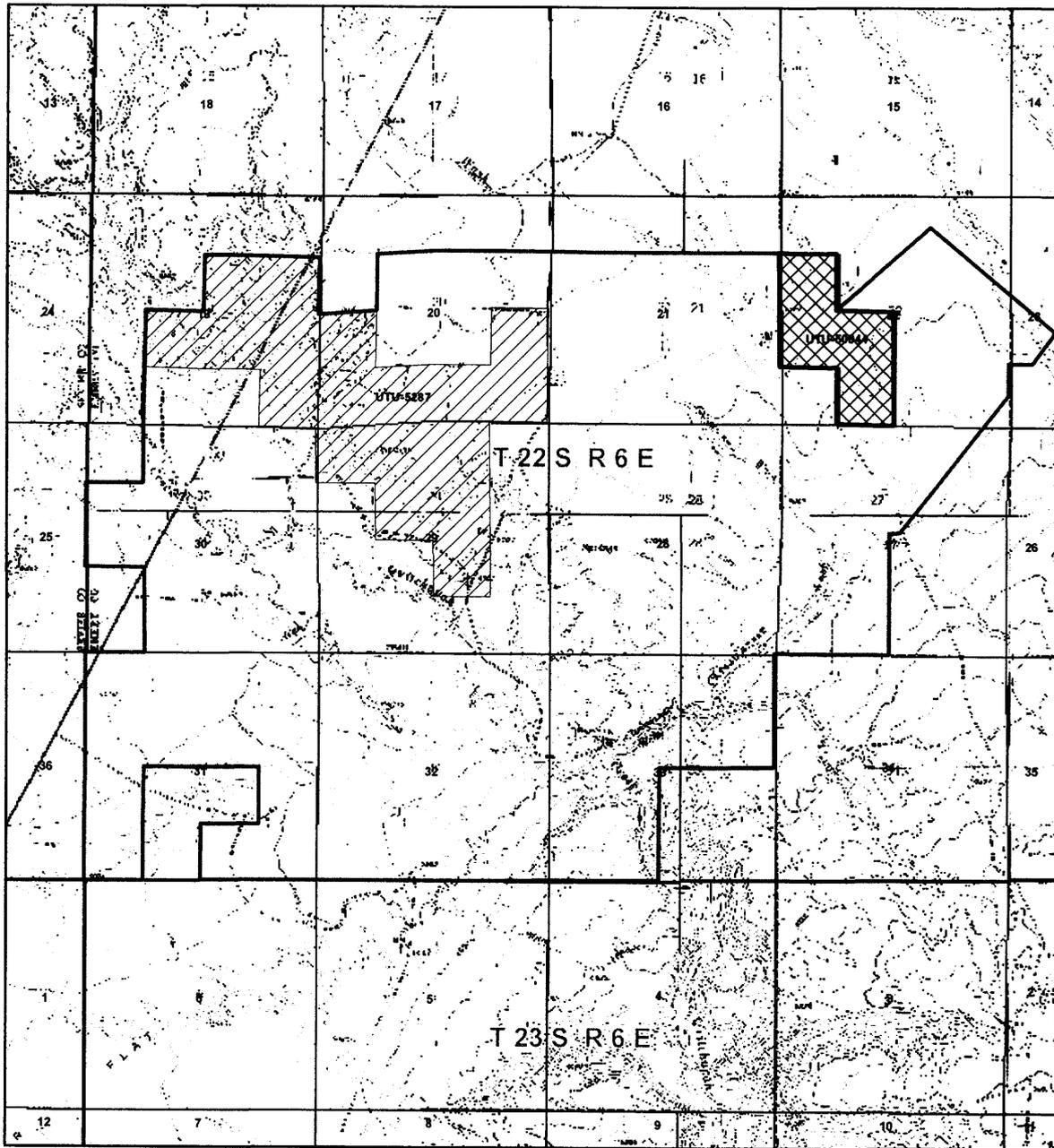
## **ANALYSIS**

No additional surface disturbance is proposed in relation to this incidental boundary change to add 160 acres in Federal lease U-50044. All mining will be done by a continuous miner. An Environmental Assessment was prepared by the Bureau of Land Management (BLM EA for the Uinta SW Utah Coal Site Specific Analysis, Emery North Tract, dated January 18, 1980).

## **RECOMMENDATION**

Consolidation Coal Company has demonstrated that mining as part of this incidental boundary change can be done in conformance with the Surface Mining Control and Reclamation Act, the corresponding Utah Coal Mining and Reclamation Act and the performance standards of the Utah Coal Mining Rules. The Bureau of Land Management issued federal lease UTU-50044 on July 1, 1983 and readjusted this lease on July 1, 2003. The BLM concurs with the decision to allow mining at this time, see recommendation for approval of the Resource Recovery and Protection Plan, dated January 18, 2007.

It is, therefore, recommended that approval be given for the addition of 160 acres to the Emery Deep Mine permit area, total permitted acreage would be 5568 acres.



**Proposed Mine Plan Modification  
Emery Deep Mine**

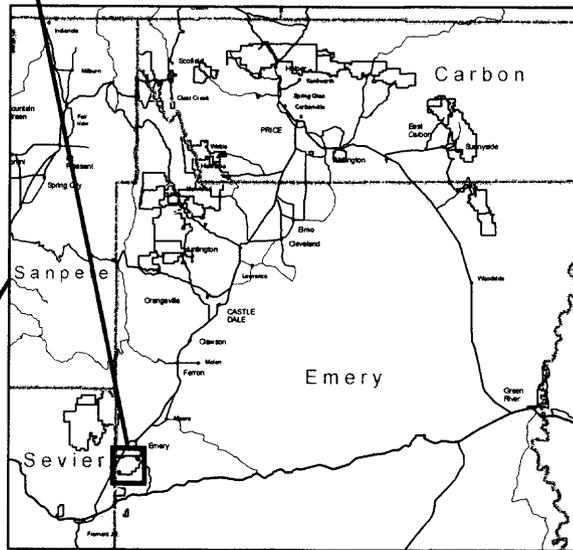
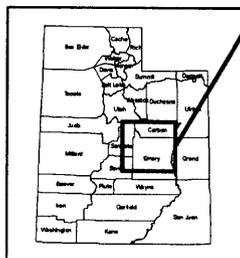
C0150015  
Carbon County, Utah  
March 2007

Township 22 South Range 6 East

- Permit Area
- Proposed State Permit Modification
- Lease Areas**
- Previous Federal Mining Plan Approval
- Proposed Federal Mining Plan Modification



0 0.125 0.25 0.5 Miles  
1:30,000



Locator Map

## PERMITTING CHRONOLOGY

### CONSOLIDATION COAL COMPANY EMERY DEEP MINE INCIDENTAL BOUNDARY CHANGE

Emery County, Utah  
C/015/0015

March 16, 2007

- September 13, 2006 Consolidation Coal Company submits the 160-acre incidental boundary change application for the Emery Deep Mine. This permitting action is considered to be an incidental boundary and will not require public notice.
- October 20, 2006 Determination by OSM that this permitting action is a mining plan modification.
- December 13, 2006 Consol submitted additional information.
- January 10, 2007 Meeting with Consol to review deficiencies and verify the priority for permitting this Emery IBC prior to the other full pillar extraction splitting plan.
- January 17, 2007 Division deficiency review sent for this IBC.
- February 13, 2007 Consol submitted response to deficiencies.
- March 6, 2007 Division deficiency review sent for this IBC.
- March 6, 2007 Consol submits response to deficiencies.
- March 16, 2007 Division issues permit with a condition that mining on this incidental boundary change area of Federal lease UTU-50044 may not commence until Mining Plan Approval is received from Secretary for this permitting action.
- March 16, 2007 Division forwards State Decision Document to Office of Surface Mining Reclamation and Enforcement for Federal Mine Plan approval.

**MINING PLAN AND MINING PLAN MODIFICATION INFORMATION  
BACKGROUND INFORMATION**

USGS 7.5 minute Quadrangle location map(s): Emery West, Emery East, Mesa Butte and Walker Flat

Year mine began production: CONSOL took over early 70's

Current permit acreage: **5408 ac.**  
Current surface disturbed acres: **66.7 ac.**  
Total acres of Federal coal within the current permit: **720 ac. (Federal Coal Lease U-5287)**  
Total acres of Federal surface land within the current permit: **80 ac. (SW/NE & NW/SE Section 19)**  
Recoverable tons of Federal coal remaining in the current permit: **795,026 tons ( R2P2)**

Average annual production rate: 1.2 million tons/year  
Maximum production rate: 1.7 million tons/year  
Coal seam(s) mined: **I seam**  
Average annual employment: 150 employees  
Life-of-Mine in current permit: 2011

Current Post mining land use: **Grazing/Wildlife**

**PROPOSED ACTION INFORMATION**

Total change in permit acreage: **160 ac. (Adding to Federal Lease UTU-50044)**  
Change in surface disturbed acres: **Zero**  
Change in acres of Federal coal: **160 ac.**  
Change in Federal surface land acres: **Zero**  
Change in recoverable tons of Federal coal: **1,055,542**

Change in average annual production: **No Change**  
Coal seam(s) to be mined: **I seam**  
Change in annual employment: **No Change**  
Change in Life-of-Mine: 2013 or 2 years additional

Reclamation bond amount: **\$2,208,000 (Bond #188617 issued by Seaboard Surety Company)**

Change in post mining land use: **No Change**

## FINDINGS

### CONSOLIDATION COAL COMPANY EMERY DEEP MINE INCIDENTAL BOUNDARY CHANGE

Emery County, Utah  
C/015/0015

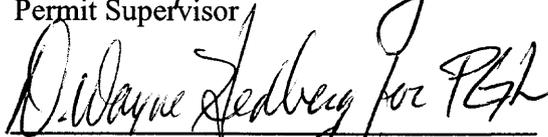
March 16, 2007

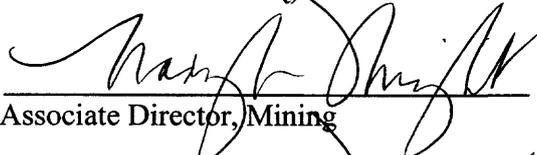
1. The revised plan and the permit application are accurate and complete and all requirements of the Surface Mining Control and Reclamation Act, and the approved Utah State Program (the "Act") have been complied with (R645-300-133.100). See attached Technical Analysis dated March 16, 2007.
2. No additional surface reclamation is required since the additional permit area will be mined as an underground extension of the existing mine. There will be no new surface facilities (R645-300-133.710).
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 conducted by the regulatory authority and no significant impacts were identified. The Mining and Reclamation Plan (MRP) proposed under the application has been designed to prevent damage to the hydrologic balance in the permit area and in associated off-site areas (R645-300-133.400 and UCA 40-10-11 {2}{c}) (See Cumulative Hydrologic Impact Analysis [CHIA], updated March 16, 2007).
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 (R645-300-133.220) ;
  - b. not within an area under study for designated lands unsuitable for underground coal mining operations (R645-300-133.210) ;
  - c. not on any lands subject to the prohibitions or limitations of 30 CFR 761.11 {a} (national parks, etc.), 761.11 {f} (public buildings, etc.) and 761.11 {g} (cemeteries);
  - d. not within 100 feet of the outside right-of-way of a public road (R645-300-133.220);
  - e. not within 300 feet of any occupied dwelling (R645-300-133-220).

5. The regulatory authority's issuance of a permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800) (R645-300-133.600). See attached letter from State Historic Preservation Officer (SHPO) dated March 15, 2007.
6. The applicant has the legal right to enter and complete mining activities through a federal coal lease issued by the Bureau of Land Management (See attached lease UTU-50044 effective July 1, 1983 and readjusted July 1, 2003) (R645-300-133.300).
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; neither Consolidation Coal Company or any affiliated company, are delinquent in payment of fees for the Abandoned Mine Reclamation Fund; and the applicant does not control and has not controlled mining operations with a demonstrated pattern of willful violations of the Act of such nature, duration, and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the provisions of the Act (R645-300-133.730). (See attached memo dated March 15, 2007).
8. Underground mining 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. The closest operating mine is the SUFCO Mine.
9. The applicant has posted financial assurance for the Emery Deep Mine Complex in the amount of \$2,208,000.00. (Bond #188617 issued by Seaboard Surety Company). No additional surety will be required, since there is no additional surface disturbance proposed (R645-300-134).
10. Prime farmlands will not be disturbed by coal mining and reclamation operations in this additional area. No lands designated as alluvial valley floors occur in this additional area. (R645-302-313.100) (R645-302-321.100).
11. The proposed postmining land-use of the permit area is the same as the pre-mining land use and has been approved by the regulatory authority. (See R645-301- 400)
12. The regulatory authority has made all specific approvals required by the Act, the Cooperative Agreement, and the Federal Lands Program.
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 (R645-300-133.500). (See memo of informal consultation between OGM and the US Fish and Wildlife Service, dated March 16, 2007).
14. All procedures for public participation required by the Act, and the approved Utah State Program have been complied with. No publication was required because this action is an incidental boundary change. (R645-300-120).

15. No existing structures will be used in conjunction with mining of the underground lease addition other than those constructed in compliance with the performance standards of R645-301 and R645-302 (R645-300-133.720).

  
\_\_\_\_\_  
Permit Supervisor

  
\_\_\_\_\_  
Permit Supervisor

  
\_\_\_\_\_  
Associate Director, Mining

  
\_\_\_\_\_  
for Director

**FEDERAL**

**PERMIT  
C/015/0015**

**March 16, 2007**

**STATE OF UTAH  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING  
1594 West North Temple, Suite 1210  
Salt Lake City, Utah 84114-5801**

This permit, C/015/0015, is issued for the state of Utah by the Utah Division of Oil, Gas and Mining (Division) to:

**Consolidation Coal Company  
1800 Washington Road  
Pittsburgh, Pennsylvania 15241  
(412) 831-4000**

for the Emery Deep Mine. A surety performance bond in the amount of \$2,208,000 payable to the State of Utah, Division of Oil, Gas and Mining and the United States Department of Interior, Office of Surface Mining Reclamation and Enforcement is filed with the Division. Consolidation Coal Company is the lessee of federal coal leases U-5287 and UTU-50044 and the lessee of certain fee-owned parcels in Sections 29 and 30, Township 22 South, Range 6 East, SLBM.

**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 coal mining and reclamation operations on the following described lands within the permit area at the Emery Deep Mine, situated in the state of Utah, Emery County, and located:

**Township 22 South, Range 6 East, SLBM**

**Section 19:** S1/2 NE1/4, E1/2 SW1/4, and SE1/4;

**Section 20:** S1/2 NE1/4, SE1/4 NW1/4 and S1/2;

**Section 21:** S1/2 N1/2 and S1/2;

**Section 22:** S1/2, SW1/4NW1/4, portions of the following:  
E1/2SE1/4NW1/4, SW1/4SE1/4NW1/4, S1/2NW1/4NE1/4,  
SW1/4NE1/4, SW1/4SW1/4NE1/4NE1/4, W1/2SE1/4/NE1/4,  
S1/2NE1/4SE1/4NE1/4, SE1/4SE1/4NE1/4

- Section 23:** portions of the following: SW1/4NW1/4, NW1/4SW1/4  
**Section 27:** W1/2, portion of NE1/4  
**Section 28:** All;  
**Section 29:** All;  
**Section 30:** E1/2, E1/2NW1/4, SW1/4NW1/4, N1/2NW1/4SW1/4,  
E1/2SW1/4;  
**Section 31:** N1/2, W1/2SW1/4, E1/2SE1/4, SW1/4SE1/4;  
**Section 32:** All; and  
**Section 33:** W1/2 and NE1/4.

This legal description is for the permit area of the Emery Deep Mine. The permittee is authorized to conduct coal mining and reclamation operations connected with mining on the foregoing described property subject to the conditions of the leases, the approved mining plan, including all conditions and all other applicable conditions, laws and regulations.

- Sec. 3 COMPLIANCE** - The permittee will comply with the terms and conditions of the permit, all applicable performance standards and requirements of the State Program.
- Sec. 4 PERMIT TERM** - This permit expires on January 6, 2011.
- Sec. 5 ASSIGNMENT OF PERMIT RIGHTS** - The permit rights may not be transferred, assigned or sold without the approval of the Division Director. 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 R645-303.
- Sec. 6 RIGHT OF ENTRY** - The permittee shall allow the authorized representative of the Division, including but not limited to inspectors, and representatives of the 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, R645-400-110, 30 CFR 842.13 and R645-400-220;
  - (b) Be accompanied by private persons for the purpose of conducting an inspection in accordance with R645-400-210 and 30 CFR 842, when the inspection is in response to an alleged violation reported to the Division by the private person.

- Sec. 7 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 approved plan and approved for the term of the permit and which are subject to the performance bond.
- Sec. 8 ENVIRONMENTAL IMPACTS** - The permittee shall minimize any adverse impact to the environment or public health and safety through but not limited to:
- (a) Any 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. 9 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. 10 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. 11 EXISTING STRUCTURES** - As applicable, the permittee will comply with R645-301 and R645-302 for compliance, modification, or abandonment of existing structures.
- Sec. 12 RECLAMATION FEE PAYMENTS** - The operator shall pay all reclamation fees required by 30 CFR Part 870 for coal produced under the permit, for sale, transfer or use.
- Sec. 13 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. 14 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. 15 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. 16 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 the Division. The Division, after coordination with OSMRE, shall inform the permittee of necessary actions required. The permittee shall implement the mitigation measures required by the Division within the time frame specified by the Division.
- Sec. 17 APPEALS** - The permittee shall have the right to appeal as provided for under R645-300.
- Sec. 18 SPECIAL CONDITIONS** - There are special conditions associated with this permitting action, as described in Attachment A.

The above conditions (Secs. 1-18) 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 the Division and the permittee at any time to adjust to changed conditions or to correct an oversight. The Division may amend these conditions at any time without the consent of the permittee in order to make them consistent with any federal or state statutes and any regulations.

**THE STATE OF UTAH**

By: \_\_\_\_\_

Date: \_\_\_\_\_

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

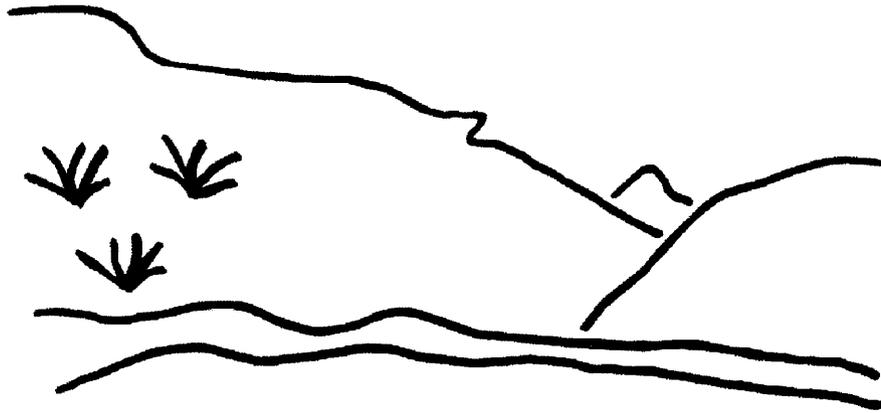
\_\_\_\_\_  
Authorized Representative of the Permittee

Date: \_\_\_\_\_

**ATTACHMENT A**  
**Special Conditions**

1. Consolidation Coal Company will submit surface and ground water quality data for the Emery Deep Mine on a quarterly basis in an electronic format through the Electronic Data Input web site, <http://hlunix.hl.state.ut.us/cgi-bin/appx-ogm.cgi>. throughout the life of the permit.
2. Consolidation Coal Company will not initiate mining within federal lease UTU-50044 until the mining plan approval is signed by the Assistant Secretary of Land and Minerals.
3. Consolidation Coal Company will submit updated acid/toxic information in Chapter III.C.5 and Chapter V. A. 4 of the MRP when roof and floor analysis becomes available from drilling (see R645-301-624.300)

# State of Utah



## Utah Oil Gas and Mining

### Coal Regulatory Program

Consolidation Coal Company  
Emery Deep Mine  
C/015/0015  
March 16, 2007

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**TECHNICAL ANALYSIS DESCRIPTION**

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**TECHNICAL ANALYSIS DESCRIPTION**

The Division ensures that coal mining and reclamation operations in the State of Utah are consistent with the Coal Mining Reclamation Act of 1979 (Utah Code Annotated 40-10) and the Surface Mining Control and Reclamation Act of 1977 (Public Law 95-87). The Utah R645 Coal Mining Rules are the procedures to implement the Act. The Division reviews each permit or application for permit change, renewal, transfer, assignment, or sale of permit right for conformance to the R645-Coal Mining Rules. The Applicant/Permittee must comply with all the minimum regulatory requirements as established by the R645 Coal Mining Rules.

The regulatory requirements for obtaining a Utah Coal Mining Permit are included in the section headings of the Technical Analysis (TA) for reference. A complete and current copy of the coal rules can be found at <http://ogm.utah.gov>

The TA is organized into section headings following the organization of the R645-Coal Mining Rules. The Division analyzes each section and writes findings to indicate whether or not the application is in compliance with the requirements of that section of the R645-Coal Mining Rules.

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March 16, 2007

**TECHNICAL ANALYSIS DESCRIPTION**

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**GENERAL CONTENTS**

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## **GENERAL CONTENTS**

The Division received an application for an incidental boundary change from Consolidation Coal Company's (Consol), which will add 348 acres to the existing permit area. Addition of the area known as the 1<sup>st</sup> North addendum will allow Consol to develop additional coal reserves in the area without the need for new surface disturbance. The area is within the current cumulative impact area (CIA).

## **IDENTIFICATION OF INTERESTS**

Regulatory Reference: 30 CFR 773.22; 30 CFR 778.13; R645-301-112

### **Analysis:**

The permittee has submitted an updated copy of officers and directors of Consolidation Coal Company. This information can be seen in appendix I-1.

The permittee has submitted in appendix I-3 a list of SMCRA permits which Consolidation Coal has throughout the United States.

### **Findings:**

The permittee has met the minimum requirements of this section.

## **VIOLATION INFORMATION**

Regulatory Reference: 30 CFR 773.15(b); 30 CFR 773.23; 30 CFR 778.14; R645-300-132; R645-301-113

### **Analysis:**

The Division does not require permittee to submit this information for amendments.

### **Findings:**

The permittee has met the minimum requirements of this section.

## **RIGHT OF ENTRY**

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Regulatory Reference: 30 CFR 778.15; R645-301-114

### Analysis:

The Consolidation Coal Company owns the surface property to the 4<sup>th</sup> East Portals. The Ownership and Leasehold Interest Map (Plate I-1) comparing this information with Plate III-1 of the amendment verifies surface ownership.

The underground coal rights at the 4<sup>th</sup> East Portal breakout on Plate IV-1 in the MRP shows no Federal Coal Lease. Consolidation Coal Company owns the coal rights as shown on Plate I-1 in the MRP.

The 348-acre permit modification is located in Township 22 South, Range 6 East. Consol is the ownership of all coal to be mined under this IBC. The surface is owned by Consol except for 19 acres. Kenneth L and Earlene Christiansen own the non-Consol surface land. Consol knows of no pending litigation concerning their right to mine coal within the IBC area.

The permittee has submitted deed information giving Consol the coal rights. The information presented will comply with statement (2) or R645-301-114.230.

### Findings:

The permittee has met the minimum requirements of this section.

## LEGAL DESCRIPTION AND STATUS OF UNSUITABILITY CLAIMS

Regulatory Reference: 30 CFR 778.16; 30 CFR 779.12(a); 30 CFR 779.24(a)(b)(c); R645-300-121.120; R645-301-112.800; R645-300-141; R645-301-115.

### Analysis:

The location of the 4<sup>th</sup> East Portal will not change from the original approved amendment. Comparing Plate III-5 in the Mining and Reclamation Plan and Plate III-1 in this submittal verifies the same location. Therefore, there will be no change in permit and disturbed area.

The disturbed area is located beginning at a point which is 5.0 feet West of the Center of Section 27, Township 22 South, Range 6 East, SML; thence North, 850.0 feet; thence West, 820.0 feet; thence South, 1195.0 feet; thence East, 820.0 feet; thence North, 345.0 to the point of beginning. The permit area is 5,408 acres for Emery Deep Mine, of this only 247 acres are disturbed. This is reflected in the MRP.

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## GENERAL CONTENTS

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Legal Descriptions of Emery Deep Mine is in Chapter 1 of the Mining and Reclamation Plan.

**Findings:**

The permittee has met the minimum requirements of this section.

### **PUBLIC NOTICE AND COMMENT**

Regulatory References: 30 CFR 778.21; 30 CFR 773.13; R645-300-120; R645-301-117.200.

**Analysis:**

The Division does not require permittee to give public notice for amendments.

**Findings:**

The permittee has met the minimum requirements of this section.

### **FILING FEE**

Regulatory Reference: 30 CFR 777.17; R645-301-118.

**Analysis:**

Filing fees are not required for amendments.

**Findings:**

The permittee has met the minimum requirements of this section.

### **PERMIT APPLICATION FORMAT AND CONTENTS**

Regulatory Reference: 30 CFR 777.11; R645-301-120.

**Analysis:**

The application indicates on page 15, Chapter III that there will be one proposed portal at the Emery Mine. This is a reference to the 4<sup>th</sup> East portal that is actually three entries. Page III-15 describes reclamation of the three portal entries at the 4<sup>th</sup> East Portal.

The disturbance at the 4<sup>th</sup> E. Portal on page IV-16 and in Table III-2 is correctly referred to in this revision of the submittal.

**Findings:**

The information provided meets the minimum requirements for Permit Application Format and Contents.

**REPORTING OF TECHNICAL DATA**

Regulatory Reference: 30 CFR 777.13; R645-301-130.

**Analysis:**

The qualifications and ARCPACS certification of the consulting soil scientist are disclosed in Appendix VII-3.

**Findings:**

The information provided meets the minimum requirements for Reporting of Technical Data.

**MAPS AND PLANS**

Regulatory Reference: 30 CFR 777.14; R645-301-140.

**Analysis:**

Included in Appendix XII-2 are vegetation and wildlife maps for the proposed permit area expansion. The maps also include a portion of the current permit boundary and the location of the 4<sup>th</sup> East portal. These maps are adequate for the proposed IBC. However, the Mining and Reclamation plan needs to include vegetation and wildlife maps that accurately depict the vegetation and wildlife communities, the permit boundary and the disturbed area boundaries for the Emery Deep and 4<sup>th</sup> East mining operations.

**Findings:**

The information provided is adequate to meet the requirements of this section of the regulations. The information required updating the MRP prior to extraction or second mining

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**GENERAL CONTENTS**

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must be submitted to the Division by no later than sixty days after the approval of this incidental boundary change.

**COMPLETENESS**

Regulatory Reference: 30 CFR 777.15; R645-301-150.

**Analysis:**

The application meets the General content requirements for Completeness as provided in R645-301-150. The Permittee has provided the Division with the necessary information to analyze and deem the MRP complete in addressing the State of Utah R-645 Coal Mining Rules.

**Findings:**

The information provided meets the requirements for Completeness as provided in the R645-State of Utah Coal Mining Rules.

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## **ENVIRONMENTAL RESOURCE INFORMATION**

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

### **GENERAL**

Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

#### **Analysis:**

The environmental resource information mainly deals with baseline information that the Division needs to make finds about suitability of the land for mining and also for reclaimability. How the Permittee meet the specific requirements will be addressed in the individual sections of the TA.

The Permittee states that coal will be extracted from the I-J coal zones in the Ferron Sandstone using room and pillar mining methods. The overlying stratum is relatively shallow ranging from 80 to 400 feet.

#### **Findings:**

Information submitted by the Permittee meets the minimum requirements of the General regulation of the Environmental Resource Information section.

### **PERMIT AREA**

Regulatory Requirements: 30 CFR 783.12; R645-301-521.

#### **Analysis:**

The Permittee met the minimum requirements for this section. The Permittee gave the Division an updated legal description in Section IV.A.1 of the MRP. Plate I-1 descriptions the number of acres that are under federal, State and private control for the entire permit.

#### **Findings:**

The Permittee has met the minimum regulatory requirements for the permit area section of the TA.

## **HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.12; R645-301-411.

### **Analysis:**

The application includes an order one Archeological survey for the permit area expansion prepared by Montgomery Archaeological Consultants. Order one surveys are typically conducted for permit boundary expansions that do not include surface disturbances. Their review resulted in the identification of four cultural resource inventories and eleven previously documented sites most of which be eligible under the (NRHP). None of the sites were located within Consol's permit boundary expansion area. According to the conclusion in the survey "it is predicted that similar site densities and site types would be found in the proposed IBC". Since the application is for development or first mining only and there is no surface disturbance the order one survey is adequate to meet the requirements of this section of the regulations. However prior to extraction or second mining an order three or on the ground archaeological survey must be completed for the IBC and submitted to the Division. A class three survey completed by Montgomery Archaeological Consultants as Appendix XIII-3 to Chapter XIII is included in the MRP. The survey covers three areas within the current permit area, (the IBC located in SW1/4NW1/4, NW1/4SW1/4, NE1/4SW1/4, and SE1/4SW1/4 of Section 22, T. 22 S., R6E, SLBM, the area overlying panel # 4 East and the area overlying panels 14 and 15 west).

The text in the survey has been revised to correctly identify these as full extraction parcels. However revisions to the maps revealed that the 4<sup>th</sup> East panel was located in a stream buffer zone and only be subject to first mining. See chapter V page 27 paragraph two and plate V-5. Plate X.A-1 and Figure 1 of the survey in combination show the location of the panels in relation to the survey areas.

The ground or pedestrian survey included archaeologists walking parallel transects 10 meters apart. The survey encompassed approximately 407.1 acres on privately owned land. The inventory resulted in the location of eight new sights, (42Em3833, through 42Em3840). There are four historic trash scatters (42Em3836, 42Em3837, 42Em3839 and 42Em3840); two corral complexes (42Em383833 and 42Em3838 which is located within the proposed IBC boundary), a wooden shed and house foundation (42Em3834) and a historic road segment with an associated fence (42Em3835). According to the survey none of the sites were recommended as eligible to the National Register of Historic Places (NRHP) as they represented common site types that were not associated with a particular settlement or historically significant property. Since none of the sites are recommended eligible to the NRHP a recommendation of "No Historic Properties" is proposed by the applicant. Concurrence with the Divisions findings by the SHPO was provided in writing to the division on March 15, 2007. [03162007]

**Findings:**

The information provided is adequate to meet the requirements of this section of the regulations. Prior to extraction or second mining an order three or on the ground archaeological survey has been completed for the IBC and submitted to the Division. Concurrence from the State Historic Preservation Office is also provided. The information required updating the MRP prior to extraction or second mining has been submitted to the Division for the approval of the incidental boundary change. [03162007]

**CLIMATOLOGICAL RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.18; R645-301-724.

**Analysis:**

Climatological information is provided in Chapter X Part B of the MRP. Precipitation records have been kept at the Emery weather station since 1901. The MRP summarizes the data from 1901 to 1978 as follows:

- 7.55 inches of precipitation annually.
- 2.97 inches during "winter," October through March.
- 4.58 inches during "summer," April through September.
- 75% of the precipitation enters the soil.
- 66% of the soil moisture is lost due to evapotranspiration.

The wettest months of the year are August and September.

The town of Emery (elevation 6,220 ft) stopped collecting weather data in 1978. The weather station was moved (between 1978 – 86) northwest to an elevation of 7,600 ft (personal communication between Mr. Tim Kirschbaum and Ms. Priscilla Burton on November 25, 2002). There it recorded a mean annual rainfall of 15.6. Another nearby weather collection station at Salina (elevation 7,560) has collected data from 1986 to the present; mean annual rainfall of 14 inches. The town of Ferron also has collected weather data for the period 7/1/48 to 12/31/01. The average annual precipitation during this time was 8.47 inches with the highest precipitation seen during the months of July through October. The average annual snowfall was 27 inches with an average snow depth of one inch. These statistics from the Western Regional Climatological Center ([www.wrcc.dri.edu/cgi](http://www.wrcc.dri.edu/cgi)) suggest that the best time for seeding at this semi-desert site is in July through October, depending upon the seasonality of the species to be seeded.

The Permittee plans to install a weather station at the main Emery Mine facilities by January 2003 (Chap. X, page 5). This weather station will collect rainfall, snowfall and record wind speed and direction as well as barometric pressure and temperature.

Climatological resource information is addressed in the MRP. The average annual precipitation at the site is about 8 inches per year. The Permittee has calculated the 10 yr-24 hr precipitation event to be 1.7 inches.

**Findings:**

The information provided meets the minimum requirements for climatological reporting information requirements of the regulations.

**VEGETATION RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.19; R645-301-320.

**Analysis:**

Vegetation information is described on page two and included in Appendix XII-2 of the application. Species include shadscale, greasewood and saltgrass. According to the information in Appendix XII-2 there are no threatened or endangered plant species located in the proposed permit boundary expansion. The appendix does include a list of T & E plant species for Emery County and species that may be located in the vicinity of the proposed permit boundary expansion. A discussion of the vegetation resources within the second IBC area, (submitted in December of 2006), is provided in Appendix XIII-2. Vegetative communities include greasewood, shadscale/winterfat dry pasture and irrigated pasture. A current list of threatened and endangered species is also included in the appendix along with a vegetation map of the proposed lease addition. Plate VIII-1 has been updated to include the vegetative communities and permit boundary changes. [03162007]

**Findings:**

The information provided is adequate to meet the requirements of this section of the regulations.

**FISH AND WILDLIFE RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 784.21; R645-301-322.

**Analysis:**

The 4<sup>th</sup> East Portal area drains into an ephemeral wash and then into Christiansen Wash. Macroinvertebrate and fish inventories were done in late September 2002 in Quitchupah Creek, Christiansen Wash and then immediately below the confluence of Quitchupah Creek with Christiansen Wash. JBR Environmental Consultants conducted the study. At station QC-2 (Quitchupah above the confluence) no fish were collected and only a single sludge worm was found during macroinvertebrate sampling. JBR suggested that this could be a result of varying flows (controlled by the mine) and agricultural run-off but most likely were due to the low gradient stream and alluvium substrate geomorphic conditions. QC-1 (below the confluence) was the most diverse site sampled for fish and macroinvertebrates; 23 fish were collected in a 0.1-mile stretch. Leathersided chub, a Utah listed sensitive species, was found at this site (Appendix IX-2). The macroinvertebrate surveys will be conducted again in September 2003 and then every third year after that (Chapter IV Page 7a). These studies were sent to Louis Berg and Leroy Mead, DWR, on December 3, 2002 for their review and recommendations. Results of baseline studies done in the early 1980's should be compared to current survey results, providing that the two data sets contain comparable parameters.

Louis Berg, DWR, stated that Ivie Creek contains flannelmouth suckers, bluehead suckers, leatherside chubs, speckled dace, and fathead minnows. The first three of these species are on Utah's sensitive species list. Quitchupah Creek is a tributary to Ivie Creek.

The application includes the current list of T & E wildlife species for Emery County. These species are not common to the proposed permit area expansion due to the lack of habitat required to sustain them.

A discussion of the wildlife resources within the IBC area, (submitted in December of 2006), is provided in Appendix XIII-2. Page 6 of the appendix has been revised to include a reference to the species listed in chapter IX, plate 10-1 in addition to the high value winter habitat for Elk. A current list of threatened and endangered species is also included in the appendix, (table2). The appendix includes a wildlife map delineating high value winter habitat for elk in the proposed lease addition area. Plate 10-1 of the approved MRP depicts an active prairie dog town, crucial / critical ring necked pheasant year long and substantial value deer year long habitats in the area where the proposed IBC is located. Plate 10-1 has been updated to include the IBC boundary, the high value winter elk habitat, substantial value moose year long S-m-yl has been deleted from the legend, high priority deer winter, H-e-wt and substantial value elk year long, S-e-yl, have been correctly identified on Plate 10-1. [03162007]

**Findings:**

Information provided in the application meets the minimum Fish and Wildlife Resource Information requirements of the regulations.

## **SOILS RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

### **Analysis:**

The Permittee met the requirements of the soil resource information section.

James P. Walsh & Associates, Inc. of Boulder Colorado conducted a soil survey of the 22.5-acre proposed 4<sup>th</sup> East Portal site in March 1981 by (MRP Section VII.A.1). The soils map is Plate VII-1. Soils mapped by the survey were the Castle Valley extremely stony very fine sandy loam, Persayo-Chipeta Complex, Killpack silty clay loam, Ferron silt loam and Rock Land.

Appendix VII-3 contains a May 2002 report prepared by Mt. Nebo Scientific, Inc, entitled, "Soil Resources Report at the 4<sup>th</sup> East Portal Area." This report summarizes the information in the plan for the 4<sup>th</sup> East portal and suggests that the rock land and Persayo-Chipeta complex dominate acreage proposed for disturbance. The report states that within the 22 acre disturbed area, 15 acres are proposed for disturbance, and approximately 13,000 cubic yards of topsoil could be salvaged.

A subsequent field report on May 31, 2002 by Jim Nyenhuis (ARCPACS certification #2753), a certified soil scientist describes 38 backhoe pits dug on the proposed 15 acres of disturbance. As a result, the area mapped as rock outcrop (RY) was reduced and the area covered by Castle Valley soils was enlarged and two inclusions were outlined: Montwel and Begay soils. Castle Valley series has been renamed Hideout by the Natural Resources Conservation Service (NRCS). Contrary to the suggestion in the 1981 soil survey, there was no evidence of excessive sodium. A summary of Mr. Nyenhuis' May 31, 2002 site visit, field notes, discussion, conclusions and revised soils map have been included in Appendix III of Appendix VII-3 of the submittal.

Soils information is provided on an Order III level for the 160-acre federal First North IBC area. and for the 348 acre fee First North IBC area. Figure XIII-1 illustrates the 1970 survey and Figure XIII-1a illustrates the Draft NRCS survey in 2007. Soils of the Minchey Loam, Ravola Loam, Tusher Loam and Penoyer Loam type have been identified as prime farmland soils when irrigated (Fig. XIII-1a and Sec. XIII C. 2). Locations of irrigated pasture vary from year to year. Figure XIIIa shows the potential for approximately 50 acres of prime farmland, if irrigated within the federal IBC. There are approximately 20 irrigated acres of prime farmland in the fee portion of the IBC. Plate VIII-6 shows irrigated pasture in the year 2006. . With full extraction, subsidence is planned and ground movement will be monitored (Chap. V, pg 27). See further discussion of productivity under Prime Farmland. [03142007]

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For the purposes of establishing baseline information, the applicant was asked to provide a summary of the renewable resource information under R645-301-332 (and by reference R645-301-320) to fulfill the requirements of R645-301-222.400 (present and potential productivity of the soils to be affected by "Surface Operations and Impacts Incident to an Underground Coal Mine"). Consol declined. Their point of view is that these resource values were not relevant, since the only impact will be subsidence in the First North IBC (email correspondence, February 27, 2007, John Gefferth to Mary Ann Wright). This argument was acceptable to the Division management. Productivity information provided by the NRCS is described under the Prime Farmland heading of this Technical Analysis. [03142007]

**Findings:**

The information provided meets the minimum requirements for environmental soil resource requirements of the Regulations.

**LAND-USE RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.22; R645-301-411.

**Analysis:**

The applicant has combined this section of the regulations with the Vegetation Resource Information in chapter XIII appendix XIII-2 and section XIII.C.3 of the application. At this time, the information in the application is considered adequate to meet the requirements of this section of the regulations. However, the permittee maintains that wildlife habitat is not a land use in the proposed IBC area. It is the Division's opinion that wildlife habitat should be considered a land use in the proposed IBC area. At this time the information in the application is adequate to meet the requirements of this section of the regulations. Because the Division and the permittee maintain differing opinions regarding the level of detail specified under this section of the regulations, Division staff will continue consulting with the permittee to clarify the application and scope of these regulations.[03162007]

**Findings:**

**ALLUVIAL VALLEY FLOORS**

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320.

**Analysis:**

### **Alluvial Valley Floor Determination**

The MRP meets the Environmental Resource information requirements for Alluvial Valley Floor Determination as required by R645-302-320. Alluvial Valley Floor information is discussed in Chapter XI of the MRP and illustrated on Plate 2 Alluvial Deposits and Soils Map of Appendix XI-1 and on Plate XI Potential Alluvial Valley Floor Along Upper Quitchupah Creek.

The following quote comes from the February 25, 1985 TA for the Emery Deep Mine:

*In determining the potential for Alluvial Valley floors (AVF's) on and adjacent to Consolidation Coal Company's Emery Deep Mine, the regulatory authority evaluated areas along Quitchupah Creek and Christiansen Wash in sections 19 – 22, 28 – 30, 32 and 33 of T22S, R6E Salt Lake Meridian*

*Section 510(b)(5) of the Surface Mining Control and Reclamation Act (SMCRA) provides specific protection for AVF's. A proviso in Section 510(b)(5) of SMCRA exempts from the requirements of Section 510(b)(5) those surface coal mining operations which in a year preceding the enactment of the Act (August 3, 1977) produced coal in commercial quantities and were located within or adjacent to AVF's or had specific permit approval from the State regulatory authority to conduct surface coal mining operations on AVF's.*

*Consol meets the requirements provided in this proviso for land sections 28, 29, 32, and 33 since a state permit was in affect and they were mining commercial quantities of coal prior to August 3, 1976.*

*Consol will be required to provide mitigating measures to areas within the exempted area where subsidence from mining operation occurs....*

*The regulatory authority determined that AVF's do not exist along Christiansen Wash. Information provided by the applicant points out that the flow in Christiansen Wash is produced mainly by flood irrigation return from fields that are initially supplied by Muddy Creek, a stream in an adjacent drainage basin....*

*The regulatory authority has determined that AVF's exist in sections 19 and 30 of the 5 year permit area which must be protected according to the established regulations governing AVF's. The applicant has committed to protecting that area known as Jack Lewis field shown as area III in Figure 1 (March 2, 1984 submittal) and has supplied the necessary information for its protection as an AVF. The regulatory authority has determined that the hatched area outlined in the accompanying map must be protected as AVF. Historically irrigation water has been diverted from Quitchupah Creek and there exists the potential that area II as well as other areas outlined in the accompanying map*

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*could be flood irrigated and sub-irrigated with waters from Quitchupah Creek. Since no mining will occur in Area II, no adverse impacts should affect the delineated alluvial valley floor.*

Area III and area II referred to in the above quotation, are outlined on Plate XI-1 of the MRP. Area I is actively flood irrigated and lies in the "grandfathered" zone, above existing workings in Section 29. Area II falls in Section 30. Area III is active flood irrigated Quitchupah Creek water in sections 19 and 30.

The 4<sup>th</sup> East Portals lie in the NE1/4 of Section 27, T. 22 S. R. 6 E. Salt Lake Meridian, on land that drains to Christiansen Wash. An ephemeral channel with a drainage area of 310.4 acres drains across the site. Most of the channel is cut in bedrock and alluvial soils are very thin. There is no sub-irrigation in the stream channel that crosses the portal site. The upper reaches of Christiansen Wash contributing to the AVF will be undermined with planned subsidence in the fee and federal First North IBC, as described in the MRP, Chapter XI.B.5 and Plate V-5.

Christiansen Wash flows through the northeast portion of the permit area and meets Quitchupah Creek at the mine facilities area. In the 1985 Technical Analysis, the Division previously determined that Christiansen Wash is not an alluvial valley floor, mainly because the source of irrigation water is brought to Christiansen Wash from the adjacent Muddy Creek drainage. The negative AVF determination for Christiansen Wash is discussed in Chapter XI.B.3 of the MRP

The fee and federal leases of the First North IBC lie between Christiansen Wash and Muddy Creek. (Chapter VIII). Plate 1 in App. XI indicates the area geology is alluvial deposits that are flood irrigated, specially managed land. More recently, Plates VI-6 and VIII-1 indicate the current land use of irrigated pasture. The Farm Service Agency has a record of approximately 48 acres under irrigation within the IBC. As noted in the MRP, the acreage of irrigation may change annually. The irrigation system is shown on Plate V-3. The source of diversion for water in the irrigation ditches is 20 miles upstream, northwest of the permit area.

Plate 1-1 shows that the land surface within the federal lease portion of the First North IBC is entirely owned by D.U. Company, Inc. [The D.U. Co. land is leased and irrigated, according to Muddy Creek Irrigation Co. representative Morris Sorenson.] Productivity of the D.U.P. land was estimated by the NRCS in their February 26, 2007 prime farmland determination letter. (Please refer to the Environmental Resources/Prime Farmland information below for productivity information as well as MRP Section XIII.C.2; the Prime Farmland determination letter in App. XII-1; and the NRCS correspondence in the 2007 Incoming folder.) Consol owns the majority of the fee land in the First North IBC, with the remainder owned by Kenneth L. and Earlene Christiansen. The Consol land is leased and irrigated.

The historical piezometric surface for the upper ferron sandstone and lower ferron sandstone aquifers are depicted on Plates VI-4 through VI-9. In the vicinity of the 1<sup>st</sup> North IBC, the potentiometric surface of the Lower Ferron Aquifer was 35 to 38 ft. below the surface in 1990. The Upper Ferron Aquifer was approximately 90 ft below the surface in 1995.  
[03142007]

### **Protection of Agricultural Activities**

Three areas are illustrated on Plate XI-1, of which Area 1 is grandfathered and not subject to the AVF rules. A buffer zone has been established around Areas 2 and 3 to protect these areas from subsidence (Chap. V and Plate V-5). Subsidence is not anticipated in these areas, but a restoration plan for Areas 2 and 3 is described in Appendix XI-3.

Soil Resources for the First North IBC are described in Section XIII.C.2. The soil types shown on Figure XIII-1a indicate that there are potentially 50 acres of prime farmlands, if irrigated. Irrigation varies from year to year. Plates VI-6 and VIII-1 indicate the 2006 land use. The Farm Service Agency has a record of approximately 48 acres under irrigation. According to Mr. Roger Barton and Jim Greenan of the Utah Association of Conservation Districts and Morris Sorenson of the Muddy Creek Irrigation Company, approximately 300 acres on either side of the Muddy Creek irrigation ditch is irrigated (personal conversation 12/12/06).  
[03142007]

### **Monitoring**

The application meets the Environmental Resource Information requirements for Modeling as provided in R645-301-726. Per conversations with John Gefferth, Environmental Engineer with Consolidation Coal Company, a MODFLO model is currently being developed. On page 168 of the submittal, the Permittee commits to providing the Division with the MODFLO modeling results and calculations when they are completed. MRP App. XI-2 Section 2.3.4 contains monitoring commitments for the ditch and water supply to the Jack Lewis field during operations and a topographic survey of the AVF in the upper Quitcupah Creek valley bottom prior to bond release. Pre-subsidence monitoring of pond embankments and irrigation ditch elevations and gradients is described for lands within the angle of draw in T. 22 S., R. 6 E., SLBM by D.U.Company and Kenneth L. & Earlene Christiansen (Chap. V, pp. 36, 37, 41, 42). [03142007]

### **Applicability of Statutory Exclusions**

None

**Findings:**

The Division determined in 1985 that an AVF exists in Sections 19 and 30 T. 22 S. R. 6 E. Salt Lake Meridian. There is not an AVF in the NE1/4 of Section 27, T. 22 S. R. 6 E. Salt Lake Meridian, where the 4<sup>th</sup> East Portals will be developed. The Division finds that Christiansen Wash is an area of irrigated pastureland dependent upon an external source of water, that being Muddy Creek, upstream of the permit area. Christiansen Wash is not, therefore, an alluvial valley floor, but Muddy Creek is an alluvial valley floor. [03142007] Therefore, the minimum requirements of determining if AVF exist have been met.

**PRIME FARMLAND**

Regulatory Reference: 30 CFR 785.16, 823; R645-301-221, -302-270.

**Analysis:**

Plate 7-8 included with the 1988 Annual Report indicates areas of flood irrigated and specially managed agricultural land in Sections 8 - 11, 13 - 17, 19 - 23, and 28 - 32 of T. 22 S. R. 6 E. Salt Lake Meridian. Diversion structures shown on this map are on the western boundary of the permit area. Plate XI-1 indicates three areas of active flood irrigation within the southwest portion of the permit area. Plate VIII-1 confirms the prevalence of pastureland and hayland within the permit area.

The 1985 TA for the Emery Mine states:

*The areas of prime farmland within the Detailed Mapping Area are shown on Plate 8-3. The potential exists that prime farmland may be impacted by subsidence in the future (see subsidence section in this TA). Prime farmland that may be impacted is located in T. 22 S., R. 6 E.; Secs 20, 22, 29, 30 and 31. These areas were identified by matching areas of prime farmland to areas of present or future underground mining.*

Plate IV-1 shows the mine progression underneath the irrigated pasturelands. The Permittee commits to notifying landowners six months prior to mining beneath their property (Chap V page 39). The notification will include information on measures to prevent, minimize or control subsidence. Mitigation is discussed in Chapter V page 41.

Appendix VII-3, indicates that there are no prime farmlands or important farmlands at the site of the 4<sup>th</sup> East Portal Area development, Section 27, T. 22 S. R. 6 E. Salt Lake Meridian. However, lands within the adjacent 1<sup>st</sup> North Main IBC area are shown as Prime Farmland in Important Farmlands of Parts of Carbon, Emery, Grand, and Sevier Counties. 1981. Utah Ag Exp Sta Res Rpt No. 76. The prime farmland status of nineteen acres of private ground owned

by Kenneth L. and Earlene Christiansen was confirmed through maps of agricultural land acquired from the United States Farm Service Agency and through discussions with the Natural Resources Conservation Service. NRCS reconnaissance of the prime farmland confirmed that the acreage is a grass pasture and is currently being irrigated (see Chap. XII p. 3 and Fig. XII-1, and NRCS letter in App. XII-1). [05/27/2005]

The 508 acre fee and federal First North IBC area is shown as Prime Farmland in Important Farmlands of Parts of Carbon, Emery, Grand, and Sevier Counties in the 1981 Utah Agricultural Experiment Station Research Report No. 76. Communication with the NRCS confirms the designation of Penoyer soils as prime farmland in the 348 acre fee portion of the IBC. (see App XII-1). The NRCS letter of "prime farmland determination" is in Appendix XII-2. The NRCS estimated that the productivity of the irrigated pasture on Penoyer soil was from 12 – 15 AUM and productivity of an alfalfa crop on Penoyer soil was from 5 to 6 Tons/acre (Appendix XII-1). Recent mapping by the NRCS has determined that the soils having potential for prime farmland within the federal IBC are Minchey loam, Penoyer loam, Ravola loam, and Tusher fine sandy loam, when irrigated. Figure XIII-1a shows that within the 160 acre federal IBC, there are approximately 50 acres of prime farmland soils, if irrigated. Communication with the NRCS on December 12, 2006, confirms that there are approximately forty-eight irrigated acres within the First North federal IBC at this time. Plate 1-1 shows that the land surface within the federal lease portion of the First North IBC is entirely owned by D.U. Company, Inc. [The D.U. Co. land is leased and irrigated, according to Muddy Creek Irrigation Co. representative Morris Sorenson.] Productivity of the D.U.P. land was estimated by the NRCS in their February 26, 2007 prime farmland determination letter as follows:

*There are two soil survey mapping units that have been designated as prime farmland ONLY WHEN THEY ARE IRRIGATED. Using the map symbols from your attached map they are PnA--Penoyer loam, 0 to 1 percent slopes and RIB--Ravola loam, 1 to 3 percent slopes.*

*The estimated yields under irrigation for the Penoyer soil with a high level of management are: alfalfa = 5 tons, barley = 75 bushels, oats = 70 to 75 bushels and pasture 10 AUMs.*

*The estimated yields under irrigation for the Ravola soil with a high level of management are: alfalfa = 6 tons, barley = 100 bushels, oats = 70 bushels and pasture = 13 AUMs.*

The yields values are taken from the SOIL SURVEY Carbon-Emery Area, UT, issued December, 1970.

[03142007]

**ENVIRONMENTAL RESOURCE INFORMATION**

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Surface disturbance from subsidence is expected when using a long wall (Chap. V, pg 27). Subsidence movement between 3 and 10 ft is projected with the area shown on Plate V-5. Ground movement will be monitored (Sec V.B.1). A pre-subsidence survey will be made of the irrigation ditches and ponds prior to full extraction in the fee and federal First North IBC (Section XII.C.2). In addition, Consol will locate subsidence monitoring points within the designated prime farmland in the IBC in consultation with the landowner (Section X.C.2). Points will be designated on Plate XII-1 of the MRP. [03142007]

**Findings:**

The Division finds that there are prime farmlands within the permit area, specifically flood irrigated and specially managed agricultural land in Sections 8 - 11, 13 - 17, 19 - 23, and 28 - 32 of T. 22 S. R. 6 E. Salt Lake Meridian, but not within the area of 4<sup>th</sup> East Portal development, NE1/4 of Section 27, T. 22 S. R. 6 E. Salt Lake Meridian. The Division finds that nineteen acres of private ground, owned by Kenneth L. and Earlene Christiansen in T. 22 S., R. 6 E., SLBM, Sec 22, SE1/4NW1/4, are prime farmland and are within the First North Main, 348 acre Incidental Boundary Change to the permit area. The Division finds in consultation with the NRCS that there are irrigated, prime farmlands within the 160 acre federal IBC. However, there will be no direct surface disturbance to prime farmland from "Coal Mining and Reclamation Operations." Protection of prime farmlands from subsidence is addressed under the Operations/Subsidence heading. [In this instance, as defined by the Coal Mining Rules and by the 2003 District Court decision, "Coal Mining and Reclamation Operations" does not include all areas described as "the permit area," on Plate 1-1 or described in Chap. 1, pg. 8.] [03142007]

**GEOLOGIC RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

**Analysis:**

Geology is described in Chapter 5 of the MRP. Chapter XIII, section XIII.C.5 briefly describes the geology of the 160-acre IBC. The 4<sup>th</sup> East Portal area is developed in the Ferron Sandstone Member of the Mancos Shale. The surface is between 50 to 70 feet above the coal bed. [03152007]

Plate VI-2/VI-2A shows the surficial geology and locations of springs for the permit and adjacent areas. Plate V-6 shows the locations of drill holes, cross-sections, and geochemical test holes. Plates V-7 through V-16 show the cross sections. Plates V-17 through V-26 show thickness and structure for seams K1, K3, J, UI, LI1, LI5, G, D, C, and A, respectively. [03152007]

The coal currently mined in the Emery Mine is the I or IJ zone in the upper Ferron Sandstone. The six seams that comprise this zone are described in Sec V.A.7; in the 160-acre IBC, the Lower I-5 is the preferred seam due to its thickness and quality. The L coal seam will not be mined because the quality is not within the standards the Permittee requires for sales. The IJ zone is only 300 to 500 ft below the surface in the 160-acre IBC area. Subsidence movement up to 6 ft is projected with the area shown on Plate V-5. Ground movement will be monitored (Sec V.B.1). [03142007]

Section XIII.C.5 of Chapter XIII and sections V.A.4 and V.A.6 of the MRP should be updated with recent coal, roof, and floor analyses. A lack of current acid/toxic information should be addressed as soon as drilling information becomes available. John Gefferth acknowledged a lack of information and agreed to provide the information in an email (January 25, 2007). Additional drilling is approved for 2007, and the Permittee commits in XIII Sec C.5 to update the MRP when information from that drilling is available. [03152007]

**Findings:**

The Permittee has submitted sufficient information to address the Coal Resource Information section of the Regulations. See stipulation under Hydrologic Resource Section.

**HYDROLOGIC RESOURCE INFORMATION**

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

**Analysis:**

**Sampling and Analysis**

Consol has conducted sampling over the Emery Deep mine site, at planned sampling stations for the past 20 years. The drainage on and adjacent to the 4<sup>th</sup> East Portal site is identified as ephemeral. The drainage is a tributary to Christiansen Wash. No samples sites are located on the drainage. Any discharges from the disturbed area will be monitored according to UPDES requirements. Retention basins are planned for the topsoil stockpile and the excavated material Stockpile. The basins are designed for total containment of the 100 yr-24 hr precipitation events.

**Baseline Information**

Baseline information is presented in the MRP. No hydrologic baseline information has been collected on drainage area the 4<sup>th</sup> East Portal area, because the site is ephemeral and no

surface or groundwater are identified for the portal site. The 100 yr- 6 hr precipitation event was calculated for the ephemeral channel crossing the portal site and the 10 yr-24 hr storms were calculated for hydrologic structure designs on site.

Plate V-3 shows the natural drainage and irrigation ditches, but the boundaries do not extend to the proposed 1<sup>st</sup> North mining area. Surface drainage for the proposed site should flows southwest, however there are no maps showing the flow pattern or no information describing the flow pattern, type of flow or water resources.

Baseline information was collected over 25 years from springs and wells that show ground water levels in the mine. The information was used to establish a model of the groundwater impacts. Updated information was submitted with the 4<sup>th</sup> East mine portal proposal. The PHC was updated to include changes of groundwater flow, effects and changes during periods when the mine was not operating.

### **Modeling**

The application meets the Environmental Resource Information requirements for Modeling as provided in R645-301-726.

The Permittee has supplied an early model showing the draw down of the groundwater as coal is mined and the mine water is pumped from the mine to Quitcupah Creek. As new models are developed, the Permittee has provided a commitment to provide the Division with results and calculations as they are compiled.

### **Probable Hydrologic Consequences Determination**

The MRP meets the Environmental Resource Information requirements for Probable Hydrologic Consequences Determination (PHC) as provided in R645-301-728. A new PHC determination was produced in lieu of the proposed full extraction mining to occur within the IBC area in December, 2006. Determination of probable hydrologic consequences for the mine is described under VI.A.7.1 of the MRP.

Beginning in Chapter VI on page 161, the Permittee discusses the probable hydrologic consequences of the mining within the Emery Deep permit area. The Permittee states, "with the exception of moderate sodium concentrations, analytical data obtained from the local rock and mine-water discharges indicate that no significant potential exists for the contamination of surface and ground water in the permit and adjacent areas by acid- or toxic-forming materials. Page 12 of Chapter XIII indicates that assuming that the total dissolved solids concentration of water discharging from the IBC area is similar to that in the remainder of the Emery Mine, and

assuming that mining in the IBC area results in a slight increase in the mine-water discharge to Quitchupah Creek, the total salt load of Muddy Creek will increase by an insignificant amount.

Increases in sediment yield from disturbed areas will be minimal. Sediment control devices such as sediment ponds and ditches have been constructed and designed per R645-State of Utah Coal Rules requirements. Sediment transported from the disturbed areas of the mine are deposited in a series of sediment ponds. In over 500 observations/recordings, none of the sediment ponds have ever discharged. As such, the disturbed runoff either infiltrates or evaporates from the ponds keeping the sediment well within the permit boundary and out of local drainages.

Water removed from the mine will be discharged to Quitchupah Creek, increasing the flow of this receiving stream. The PHC discusses that the Ferron Sandstone aquifer does provide base flow to Christiansen Wash and Quitchupah Creek within the permit area and adjacent areas. It is assumed that there will be local decrease to base flow for these drainages as a result of mining, however; due to several factors that affect the flow of these drainages (such as direct irrigation return flow of water originating in Muddy Creek, discharge from the Emery Mine and overland flow from precipitation runoff), the magnitude of these impacts is difficult to quantify. The impacts will likely be minimal as a result of mining as USGS studies have indicated that the amount of baseflow being supplied to the drainages from the Ferron Sandstone aquifer is minimal relative to the recharge component from the Joe's Valley Paradise Fault system. Furthermore, as stated previously, water removed from the mine is discharged to Quitchupah Creek, thus the vast majority of water does not leave the watershed. Actual water losses are due to pond evaporation, coal moisture consumption due to ventilation and evaporated water as a result of dust suppression efforts. The cumulative effect of these combined losses is minimal in terms of the overall hydrologic balance of the affected drainages (i.e. Christiansen Wash and Quitchupah Creek).

The submitted PHC provides a thorough discussion of the hydrogeologic setting. The Permittee discusses the Ferron Sandstone layers in detail including discussion as to the recharge and discharge areas of the geologic unit.

In addition, the revised PHC provides a thorough discussion as to the mine water discharge calculations that were performed in an effort to estimate future mine water discharge rates, taking into account full extraction mining. Two methods were utilized in an attempt to provide this estimate: the Freeze and Cherry equation and the Hantush equation. The Freeze and Cherry equation assumes that the mine acts as an infinitely long tunnel in a homogenous, isotropic porous medium. The Hantush equation assumes that the aquifer is homogenous, isotropic, pumped at a constant rate and is applied to large underground openings. The equations were utilized in an effort to provide estimates of the vertical mine-water inflow. By utilizing measured mine water discharge rates (See Figure VI-20A. Average Mine Water Discharge by Year), and assuming that water discharged from the mine during the shutdown period between

1991 and 2001 was equal to the amount of predominantly horizontal inflow to the mine, the Permittee estimated a value of 0.40 cfs for in-mine water usage. This value was calculated by taking the difference between average mine water discharges during the shutdown period (1991-2001) and the period following where mining resumed with two continuous miners (2002-2005). The Hantush equation estimates produced a much better correlation with measured mine-water discharge rates (See Table VI-23A). Calibrating the Hantush equation with measured discharge rates derived hydraulic conductivity rates for the aquifer. Based on the Hantush equation, and accounting for mine-water inflow and usage as discussed above, the Permittee has predicted mine-water discharge rates through the period of the current mine plan (2013). The results are summarized in Table VI-23B with an average predicted discharge rate of 1.50 cfs. The Division finds that these calculations and inherent assumptions are reasonable in predicting mine water discharge rates.

Development of the 4<sup>th</sup> East Portal did not require changes to the PHC due to the lack of surface or ground water resources that could be impacted by operating those facilities.

#### **Groundwater Monitoring Plan**

The Permittee is currently conducting a groundwater monitoring plan, which includes measuring and sampling springs, wells and mine water discharges (UPDES point source discharge) on and adjacent to the permit area. The information is input into the DOGM Coal Mining database.

There are two identifiable ground water or recharge sources on the 4<sup>th</sup> East permit area. Monitoring Well SM1-2 monitors the quality and water level in the Blue Gate Shale. The site is just southeast of the permit area. No groundwater will be discharged from the 4<sup>th</sup> East Portal site.

#### **Surface-Water Monitoring Plan**

The Permittee is currently conducting a surface water monitoring plan, which includes measuring and sampling streams and ponds (UPDES) on and adjacent to the permit area. The information is input into the DOGM Coal Mining database.

There are no perennial or intermittent surface water sources on the 4<sup>th</sup> East Portal site. Runoff calculations have been completed to establish design flows over the site and for the undisturbed drainage area. Hydrologic structures have been designed to divert, control and contain all runoff from design storms.

The sedimentation Pond is designed to contain the runoff from the disturbed areas. The applicant has calculated the runoff and sedimentation production from the 10 yr.-24 hr. design

storm. Prior to any discharges from Sedimentation Pond #9, the discharged material has to meet the water quality of the UPDES permit, UT0022616.

Several hydrologic structures will reduce the disturbed area of the 4<sup>th</sup> East Portal by capturing flows that would have gone to the sedimentation pond. The box-cut ramp and ROM, and catch basins on the rock storage and topsoil stockpiles will capture and retain runoff. The bermed undisturbed area will also keep runoff from entering the pond. This results in a smaller pond for the site.

#### **Alternative Water Source Information**

With the development of the ramp and ROM stockpile precipitation that will be intercepted and diverted into the mine. An average (based on average annual precipitation) of 1.33 ac-ft per year will be diverted into the mine. The Permittee has contacted Mark Page of the Division of Water Rights to determine if a water right has to be filed on the water diverted into the mine. Mark Page stated in a telephone conversation that obtaining a water right for this small area was not required. Consul requested a statement in writing from the Division of Water Rights on October 21, 2002. They responded with a letter on October 30, 2002 indicating that a water right for surface water interception would not be required, because any water discharged into the mine would be a small amount and that water would be treated and discharged again.

No water rights are held at any sites on the 4<sup>th</sup> East permit area. This has been verified by evaluating Point of Diversion Plots created Wednesday, December 4, 2002 using "on-line" Internet services provided by the Utah Division of Water Rights, plot of Township 22S, Range 6 East, Salt Lake Baseline and Meridian.

#### **Findings:**

The Permittee has supplied sufficient information to describe the amount of coal that will be mined from the seams in the IJ zone (personal communication with John Gefferth on May 20, 2005); the L coal seam will not be mined because the quality of coal cannot be used by their customers. The total thickness of coal is shown to be range from 20 feet to 8 feet.

### **MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

#### **Analysis:**

##### **Affected Area Boundary Maps**

The Division usually considers the affected area to be the same as the permit area. There are several maps that show the location of the permit area.

All maps in the MRP that reflect the current permit boundary have been updated to include the second IBC, (submitted in December of 2006). The maps submitted on the CD illustrate the addition of the IBC to the permit boundary. The final version of all the maps reflecting the new permit boundary will be provided to the Division on March 19, 2007. The legends coincide with the permit boundary delineation and are consistent throughout the map section. The lease number for the IBC area has been corrected on all maps. Plate VI-6A has been revised to eliminate those portions of the panels that extend beyond the permit boundary. Plate V-5 has been revised to eliminate those portions of the projected subsidence areas that extend beyond the permit boundary. Other inconsistencies with plate V-5 include:

- The delineation of full extraction as compared to plate X.A-1. These two plates have been revised to show the current and proposed full extraction areas. [03162007]

The affected area boundary area is shown on several plates, including Plate III-1, IV-10a, and VI-12.

#### **Archeological Site Maps**

Plate X.A-1, Permit Area Cultural Resources has been updated to include the location and identification of the eight sites identified in the cultural resources inventory dated February 14, 2007. [03162007]

#### **Coal Resource and Geologic Information Maps**

Plate VI-2/VI-2A shows the surficial geology and locations of springs for the permit and adjacent areas. Plate V-6 shows the locations of drill holes, cross-sections, and geochemical test holes. Plates V-7 through V-16 show the cross sections. Plates V-17 through V-26 show thickness and structure for seams K1, K3, J, UI, LI1, LI5, G, D, C, and A, respectively.

#### **Cultural Resource Maps**

An updated cultural resource map that identifies the permit area expansions, (4<sup>th</sup> East portal, and 2IBC's), is included in the application as appendix XII-3 figure one. Plate X.A-1, Permit Area Cultural Resources has also been updated to include the proposed IBC area. The Plate has also been updated to include the location and identification of the eight sites identified in the cultural resources inventory dated February 14, 2007, (same requirement for Archaeological site maps). Other inconsistencies with plate X.A-1 that have been corrected include:

- *The delineation of full extraction in a "Buffer Zone" under Christiansen Wash see chapter V page 27 paragraph two and plate V-5. [03162007]*

### **Existing Structures and Facilities Maps**

The only existing structure that is shown on the maps in the 4<sup>th</sup> East Portal area is the County road, Cowboy Mine Road No. 915. In the text the Permittee states that there are not structures in the 4<sup>th</sup> East Portal area with the exception of the a subsidence monitoring monument.

### **Existing Surface Configuration Maps**

The pre-existing topography is located on Plate III-5, 4<sup>th</sup> East Portal Site Pre & Post-mining Topography Plan View. The pre-existing topography is shown overlapping the proposed post-mining topography. The maps is at a scale of 1" = 100' and was certified by and registered professional engineer.

The current structural geological maps are provided in Chapter 6 of the MRP. Plates V-19, V-20 and V-21 show the geology and structure of the area and coal Isopach for the J, IU, and L11 seams.

### **Mine Workings Maps**

Plate XII-1 shows the proposed mine plan and timing sequence of mining.

### **Monitoring and Sampling Location Maps**

The MRP meets the requirements for Monitoring and Sampling Location Maps. Plate VI-3, Ground Water Monitoring Well and Surface Water Monitoring Site Location Map, depicts monitoring locations for the ground water monitoring wells and surface water sites. Plate VI-2/VI-2A, Geology of the General Mine Area depicts the springs that are monitored as part of the approved water monitoring program.

### **Permit Area Boundary Maps**

The permit boundary will not change with the construction of the 4<sup>th</sup> East Portal area. However it will change wit the addition of the IBC area (submitted in December of 2006), Plate VI-12 shows the location of the 4<sup>th</sup> East Portal disturbed area boundary and the permit boundary. Several maps in Chapters 6 and 7 show the existing surface configuration of the IBC, however the IBC is not outlined the any of the maps. The new permit area is 5,568 acres.

Permit boundary, which includes the two IBC's, is shown on Plate XII-1. All maps have been updated to reflect the current permit area. [03162007].

### **Subsurface Water Resource Maps**

The application meets the Environmental Resource Information requirements for Subsurface Water Resource maps as provided in R645-301-722.100. Figure XIII-2 on page 9 of Chapter XIII and Plate VI-4 of the approved MRP depict the potentiometric surface of the Upper Ferron Sandstone within the permit and adjacent areas.

### **Surface and Subsurface Manmade Features Maps**

There are no known manmade hydrologic features other than what has been mentioned under the Monitoring and Sampling locations map.

### **Surface and Subsurface Ownership Maps**

Surface and Subsurface ownership is shown on Plate I-1 in the MRP and have been updated to include the IBC area, 9submitted in December of 2006). [03162007]

### **Surface Water Resource Maps**

The application meets the Environmental Resource Information requirements for Surface Water Resource maps as provided in R645-301-722.200. Plate VI-1, Location Map Surface Water Stations, depicts the surface water features within the approved permit area as well as in the areas adjacent. Plate V-5, Subsidence Monitoring Points and Buffer Zones, depicts the buffer zones that will be established on perennial surface water features within the permit area. Plate V-3, Presubsidence Survey: Hydrology, depicts natural streams, dry washes and irrigation ditches located within the permit boundary and proposed IBC area.

### **Well Maps**

Plate VI-3 shows the monitoring and sampling locations for groundwater monitoring sites including wells.

### **Findings:**

The information provided in the MRP meets the requirements for the maps, plans and cross-sections of resources information section.

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**ENVIRONMENTAL RESOURCE INFORMATION**

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**OPERATION PLAN**

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## **OPERATION PLAN**

### **MINING OPERATIONS AND FACILITIES**

Regulatory Reference: 30 CFR 784.2, 784.11; R645-301-231, -301-526, -301-528.

#### **Analysis:**

The mining operations at the Emery Mine will be room-and-pillar mining methods. Plate IV-1 shows the layout, existing workings and proposed workings. The Permittee proposes to access the coal resources through the 4<sup>th</sup> East Portals.

The portal excavation is designed to access three 8 foot by 14 foot entries located at the southeast end of the 4th East mining section. The purpose of these entries is to provide intake air and access the north and east sections of the mine. The excavation is designed around a 0.5H:1V slide slopes with a 5-foot safety berm, at approximately the halfway point, and a 60-foot bottom width. The ramp will have a grade of 10% to reach the entry level of the portals.

Before rock excavation, all topsoil will be removed and stockpiled for use in final reclamation. The topsoil stockpile will have a berm place around it. Seeding will stabilize the surface of the topsoil stockpile. The topsoil pile will be surveyed to determine the yardage and the average topsoil replacement depth. The Permittee does not anticipate a topsoil deficiency. However, if one exists following the survey of the stockpile, the Division will be notified and a plan will be developed.

Portal excavation will remove approximately 99,000 bank cubic yards of rock. The surrounding stockpile is designed to contain 128,000 loose cubic yards, at an approximate height of 20 feet. The excavation work will be performed by a licensed contractor who will be required by contract to comply with all applicable state and federal laws in the use of explosives. Coal removed from the bottom area will be hauled to the existing tipple area. An area at the top of the ramp will be graded to accommodate vehicle parking, storage of supplies, water tank and a rock dust storage bin. Entry to the mine will be restricted by a chain link fence and locked gates.

An airshaft is proposed to be located in the southwest portion of the 4<sup>th</sup> East Portal area. The 16-foot outside diameter shaft will be equipped with an exhaust fan. The airshaft is required to supply ventilation to the north and east sides of the mine. The shaft will be 70 feet deep. Construction of the airshaft will result in approximately 520 cubic yards of material that will need to be stored in the material stockpile.

## OPERATION PLAN

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The cut material from the portal ramp and airshaft will be placed in the excavation material stockpile. The material will be used to backfill the ramp and shaft during reclamation.

The proposed facilities and structures that will be associated with the 4<sup>th</sup> East Portal area include:

- A three-entry portal system that will be located at the bottom of an open cut located at the eastern edge of the permit area, along with a ramp. The portals will be used to allow access of rubber-tired vehicles and to serve as a coal haulage portal.
- Topsoil stockpile.
- Excavation Material Stockpile.
- Sediment Pond #9.
- Coal Handling Facilities and Stockpiles.
- Stream Diversion – Unaffected Drainage.
- Storage Area.
- Airshaft.
- Rock Dust Bin.
- County Road – Cowboy Mine Road No. 915.

### Findings:

The information provided in the amendment is considered adequate to meet the requirements of the mining operations and facilities sections of the regulations.

### EXISTING STRUCTURES:

Regulatory Reference: 30 CFR 784.12; R645-301-526.

### Analysis:

An existing structure means a structure or facility used in connection with or to facilitate coal mining and reclamation operations for which construction began before January 21, 1981. There are no existing structures in the area with the exception of a subsidence monument that the Permittee will remove before construction. The Permittee committed to replace the subsidence monument after construction is completed.

### Findings:

The information provided in the amendment is considered adequate to meet the requirements for existing structures requirements of the regulations.

## OPERATION PLAN

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### PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

Regulatory Reference: 30 CFR784.17; R645-301-411.

#### **Analysis:**

According to the information in the Archaeological survey performed by Montgomery Archaeological Consultants, the applicant has stated in section XIII.C.1 of the application "there are no cemeteries within 100 feet of the IBC boundary. There are no public parks located within the IBC area. There are no lands within the boundaries of the National system of Trails or Wild and Scenic Rivers System within the IBC, 9submitted in December of 2006. [03162007]

#### **Findings:**

The information in the application is adequate to meet the requirements of this section of the regulations. [03162007]

### RELOCATION OR USE OF PUBLIC ROADS

Regulatory Reference: 30 CFR 784.18; R645-301-521, -301-526.

#### **Analysis:**

The Permittee will be constructing fences and berms and installing culverts within 100 feet of the right-of-way line County road No. 915. The Permittee committed to use flagmen and place warning signs on the County road during construction activities that are within 100 feet of the County road. This method has been used by other Permittee's and shown to be effective.

#### **Findings:**

The Permittee has met the minimum requirements for the relocation or use of public roads section of the regulations.

### AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR 784.26, 817.95; R645-301-244, -301-420.

#### **Analysis:**

## OPERATION PLAN

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The facility will include a 2,600-ton surge stockpile, a screening/crusher building, and a 10,000 ton processed coal stockpile along with associated conveyors. The facility will handle a capacity of approximately 2,000,000 tons of coal per year (page 17b, Chapter II).

Appendix X.C-2 contains the Air Quality Approval Order (AO) from the Division of Air Quality dated August 5, 2002. The AO itemizes the equipment located at the new portal site.

The AO indicates the following:

- The production limit of 1,300,000 tons/yr should not be exceeded.
- The ROM surge pile may contain 1500 tons maximum.
- The maximum time period of operation for the 425 hp diesel generator should be 300 hours of operation /12 mo period (using #2 diesel fuel oil).
- Visible emissions from conveyor transfer points should not exceed 10% opacity and emissions from all other sources should not exceed 20% opacity. Observations of opacity are to be made in accordance with 40 CFR 60.11 (b) and 40 CFR 60, Appendix A, Method 9.

Item 9 of the General Conditions listed in the AO requires that Consolidation Coal Company “notify the Executive Secretary in writing when the installation of the equipment listed under the new portal site has been completed and the equipment is operation, as an initial compliance inspection is required.”

The excavated material pile will cover 4.10 acres (see page VI.B.3-188a). The excavated material is angular sandstone. The pile will have many voids to collect loose grains. A berm has been created on the top of the pile and large rocks will be scattered across the surface of the pile to break the wind and prevent wind erosion of the pile.

### **Findings:**

The information meets the minimum requirements for Air Pollution Control Plan.

## **COAL RECOVERY**

Regulatory Reference: 30 CFR 817.59; R645-301-522.

### **Analysis:**

The Division has reviewed the mining plan and found that the Permittee will extract the maximum amount of coal possible. The Division usually relies on information in the R2P2 for the analysis. The R2P2 was not approved by the BLM at the time this TA was completed. If the

## OPERATION PLAN

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BLM finds that the Permittee is not maximizing coal recovery the Division will reevaluate the finding based on the new information.

The first and second south sections will have a projected total coal recovery of 75.3 percent from center of entry. The coal recovery can and will change depending on depth of cover and geological conditions. Coal recovery in the second south section should increase since full extraction has been approved only for the panel. [11042005]

The Permittee supplied sufficient information to describe the amount of coal that will be mined from the IJ zone. The total thickness of coal in the permit area is shown to range from 4 to 21, from 7 to 10 ft in the 160-acre IBC (Plate V-20). The permittee explained in a meeting held on May 18, 2005, only the J and I coal seams will be mined for this IBC. Mr. Gefferth stated that the coal in the L seam is of poor quality and will not be mined. The Permittee initially stated that no subsidence was planned, but the MRP now has a subsidence-monitoring plan (Sec V.B.1) and anticipated subsidence of up to 6 ft is shown on Plate V-5.

### **Findings:**

The Permittee has submitted sufficient information to address the Coal Recovery Information section of the Regulations.

## SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

### **Analysis:**

#### **Subsidence Control Plan**

The application meets the Operational Plan requirements for Subsidence Control Plan as provided in R645-301-525.120, -525.480. The Permittee provides a subsidence control plan in Chap. V. B. of the MRP. [11042005]

Section V.B of the MRP discusses subsidence monitoring. Page 36 of the MRP outlines the steps and elements of the proposed subsidence-monitoring plan. The plan calls for the establishment of a series of reference points to be established outside the theoretical angle of draw. Item 1A on page 36 calls for a mine representative to inspect monthly the areas designated as "full extraction" on Plate V-5. The monthly inspections will continue until the survey monitoring points below indicate that there is no subsidence occurring. A record of the monthly inspections will be produced and forwarded to the Division. A copy of the inspection will also be kept at the mine office.

In addition, the Permittee has committed to establish pre-mining elevations and gradients of any irrigation ditches and pond embankments within the angle of draw. The Permittee will also monitor these areas by visual inspection and post-subsidence ground survey to establish the effects of subsidence. The Permittee has committed to providing the Division with a quarterly subsidence mitigation report that describes the surface mitigation projects and their status broke down by surface landowner. The Permittee will also update the existing pre-subsidence survey and Plate V-3, Presubsidence Survey: Hydrology, six months prior to full extraction and provide copies to the surface landowner, the Division and the water conservancy, per R645-301-525.130.

MRP App. XI-3 Section 2.3.4 contains monitoring commitments for the ditch and water supply to the Jack Lewis field during operations and for a topographic survey of the AVF in the upper Quitchupah Creek valley bottom prior to bond release. [03142007]

The permittee has modified the subsidence control plan to include a monthly walk over inspection of the surface area overlying 1<sup>st</sup> and 2<sup>nd</sup> South. A record of the inspection will be kept on site. This is additional to the requirements to the land survey in the MRP.

The Permittee updated the subsidence plan in Appendix V B to include information about subsidence in the 160-acre IBC.

### **Subsidence Mitigation**

The application meets the Operational Plan requirements for Subsidence Mitigation as outlined in R645-301-525.480 relative to hydrology. Subsidence mitigation efforts are discussed on pages 39-42 of Chapter V of the approved MRP as well as on page 13 of Chapter XIII. Page 13 of Chapter XIII and pages 41 and 42 of the approved MRP generally discuss timetables and how the Permittee will negotiate with landowners regarding mitigation efforts. On page 39 of Chapter V of the approved MRP, the Permittee discusses the mitigation process relative to subsidence damage to structures and State appropriated water supplies. The Permittee commits to “restore, rehabilitate or remove and replace, to the extent technologically and economically feasible, each materially damaged structure, feature or value”.

Page 41 in Chapter V of the MRP discusses subsidence mitigation. The Permittee states, “If subsidence occurs which prevents flow through a ditch that is used each summer, then it will be necessary to repair the ditch as soon as practical even though future subsidence may necessitate further work”. In addition, the mine has been designed to preclude subsidence in areas occupied by perennial streams. The Permittee has produced a plan to prevent subsidence from affecting Quitchupah Creek, Christiansen Wash and the alluvial valley floor area on the west side of the permit area by establishing buffer zones in these areas. Plate V-5, Subsidence Monitoring Points and Buffer Zones, depicts a stream buffer zone extending the full length of Christiansen Wash in the areas where full extraction mining will take place. Additionally, a

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buffer zone has been established in the alluvial valley floor area around Quitchupah Creek. The overburden depth and the angle of draw were used to determine the buffer zone dimensions. The buffer zone for Quitchupah Creek and Christiansen Wash includes an additional standoff distance of 100 ft. on either side.

The Permittee provides a commitment to “repair or replace any adversely affected State appropriated water supplies that are contaminated, diminished or interrupted” as required by R645-301-731.530 on page 41 of Chapter V of the MRP.

On page 13 of the newly submitted Chapter XIII, the Permittee states, “The pre-subsidence survey will be updated on all surface areas depicted on Plate V-5 prior to secondary mining. If the irrigation system is still functional at the time of subsidence, Consol will visually inspect the irrigation system before and during the growing season.”

**Renewable Resources Survey**

The application indicates that there are no appropriated points of diversion within the IBC, but that there are surface irrigation rights (Table VI-20). The Permittee has extended protection and mitigation to points of appropriation in Chap. XIII.C.6.6.

Chap. V. vol. 2, App. V-3, the pre-subsidence survey was stamped “Received” in 1998 and will be updated with current information on pond embankments and irrigation ditches within the angle of draw in the 1<sup>st</sup> North IBC (Chap V. p. 37). Plate V-1 illustrates the locations of structures identified in the 1998 document. Structure 89 (1/4 section marker), 90 (three man made ponds, 100 ft. diameter), 91 (1/16 section marker), 92 (fence and dirt road), and 93 (irrigation ditches draining NW to SE and 28 acres farmland) are within or immediately adjacent to the IBC. The Division notes that items 103 and 110 shown on Plate V-1 being immediately west of the IBC will also be subsided by full extraction mining. Within the area identified as 103, there are two ponds and several irrigated fields. Within item 110 there was a two-story wood-frame barn in good condition, 150 acres of farmland, and a 300 ft. X 100 ft. pond. All ponds were full at the time of the 1998 survey, but no depths were reported. Capacity of ponds was requested, but not agreed upon by all parties during phone negotiations. Parcels owned in T. 22 S., R. 6 E., SLBM by D.U. Company and Kenneth L. & Earlene Christiansen will be surveyed prior to full extraction mining, as per pre-subsidence survey commitment found in Chapter XII.C.2; Chap. XIII, Sec. D.2.; and Chap. V, pp. 36, 37, 41 and 42 of the MRP. Plate V-5 illustrates that subsidence is likely to be expressed as parallel depressions of the land, sloping 3 ft. in 2,500 ft. (.01% slope) to a low point and back up again, in a diagonal pattern that follows the mine panel extraction. This pattern runs perpendicular to the established irrigation drainage ditches. . In addition, Consol will locate a subsidence monitoring point within the designated prime farmland in the IBC in consultation with the landowner (Section X.C.2). This point will be designated on Plate XII-1 of the MRP. [03142007]

**Performance Standards For Subsidence Control**

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Subsidence movement between 3 and 10 ft is projected with the area shown on Plate V-5. Ground movement will be monitored (Sec V.B.1). [03142007]

The Permittee indicates in Chap V, pg 39 that subsidence cracks will be graded and/or backfilled as required to the satisfaction of the three parties involved: DOGM, the Permittee, and the landowner. Currently, the Permittee is filling cracks above the partial pillar extraction area in the First South panel. Best management practices were discussed with the Permittee during review of this amendment, they include allowing time for self healing of cracks and combining repair work to limit travel to the sites during subsidence repair. [10072005]

**Notification**

During a recent inspection, landowner notification letters were given to the Division inspector. The following landowners were notified: Byars, Christiansen, Carter, Odle, D.U. Co., Staley, Robertson, Humphrey. The letters advised that underground mining activities may occur beneath the owners' property and gave the location of the Price Field Office to review a copy of the subsidence plan. However, no pre-subsidence survey was included with the letters. Copies of the pre-subsidence survey will be provided to the Division, Water Conservancy District and landowners as per item 13, pg. 37, Chap V. [03142007]

**Findings:**

The permittee has met the minimum requirements of this section.

**FISH AND WILDLIFE INFORMATION**

Regulatory Reference: 30 CFR Sec. 784.21, 817.97; R645-301-322, -301-333, -301-342, -301-358.

**Analysis:**

**Protection and Enhancement Plan**

The only potential impacts to wildlife species would be from subsidence. As there is no subsidence anticipated with first or development mining in this case the applicant would not need to address this section of the regulations at this time. Since then the permittee has submitted and received approval for full extraction in the 1<sup>st</sup> North IBC area. However prior to extraction or second mining the permittee will need to revise chapter nine of the Mining and Reclamation plan. That revision will need to include a narrative and or plan that describes how wildlife will be protected and enhanced as a result of the potential impacts from subsidence. The information

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required updating the MRP prior to extraction or second mining must be submitted to the Division by no later than sixty days after the approval of this incidental boundary change. The MRP does not include a protection and enhancement plan for the proposed IBC. According to the U. S. Court of appeals decision No. 02-5136 Citizens Coal Council et al vs. Gale A. Norton, Secretary of the Interior and the National Mining Association the applicant may not be required to address this regulation. The applicant has stated that the IBC currently under review, (full extraction of coal), does not meet the definition of mining and reclamation activities as defined in section R645-100.200 of the Utah Coal rules. Attorneys for the Division and Consol are scheduled to discuss the applicability of the referenced court case. In the interim the Division is not requiring the applicant to address this section of the regulations. [03162007]

**Endangered and Threatened Species**

Threatened and Endangered plant species for Emery County are listed on page 4 of Appendix XIII-2. No T&E plant species were found within the study area. As well the habitat assessment suggested almost no chance of species occurrence at the sites. The location of the study area is included on page one of appendix XIII-2. [03162007]

Threatened and Endangered animal species for Emery County are listed on page 7 of Appendix XIII-2 of the MRP. Calculations for mine water discharge are provided for in chapter VI.A.7, PHC and appendix VI-9 of the MRP. [03162007]

Potential water depletions from mining operations may have an affect on endangered fish species identified in pertinent fish recovery programs. Volumes of water consumed in mining processes in excess of 100acre feet/year require mitigation with the U. S. Fish and Wildlife Service. Calculations for water depletions and gains from mining activities are provided for in the 2003 Midterm Review correspondence for the Emery Deep Mine. The correspondence from John Gefferth to Lowell Braxton dated November 26, 2003 describes the water consumed from mining consumption, (roof bolters, continuous miners, belt sprayers and miscellaneous dust suppression as received coal moisture at 6%. This is compared to the inherent coal moisture at 4% and the 2% difference is calculated in ac- ft per year that is approximately 3.6-ac-ft per year. Water consumed from ventilation is approximately 25-ac-ft per year and mine water discharge is 420-ac-ft per year of water. Evaporation from the sediment pond would be negligible as there is a continuous inflow and discharge or outflow from the pond. The result is a net gain of 391.4-ac-ft per year of water. The information in the correspondence and explanation by way of personal communication are adequate for the proposed IBC. However, the Mining and Reclamation plan needs to be updated to include these figures. The information required updating the MRP prior to extraction or second mining must be submitted to the Division by no later than sixty days after the approval of this incidental boundary change.

With the approval of the 1<sup>st</sup> North IBC the MRP has been update to include mine water consumption calculations for projected full extraction mining. Chapter II, page25a of the MRP

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includes criterion for estimating mine water consumption for present and future mining operations. Calculations and numbers and references have been included with the criteria that are used in determining the mine water consumption value in acre-feet per year. According to the figures in table VI-23B page 169 the predicted discharge of 1.5 cfs would be approximately 1,086 acre feet per year minus the consumptive losses of 48.5 acre feet per year equal a net gain of 1037.5 acre feet per year net gain to the Colorado watershed. According to the USFWS protocol this net gain would constitute a "No Effect" determination. [03162007]

Additional species in Utah's Sensitive species list include the following;

**Conservation Agreement Species**

Northern Goshawk

*Accipiter gentilis*

**Wildlife Species of Concern**

Grasshopper Sparrow

*Ammodramus savannarum*

Short-eared Owl

*Asio flammeus*

Burrowing Owl

*Athene cunicularia*

Ferruginous Hawk

*Buteo regalis*

Greater Sage-grouse

*Centrocercus urophasianus*

Black Swift

*Cypseloides niger*

Bobolink

*Dolichonyx oryzivorus*

Lewis's Woodpecker

*Melanerpes lewis*

Long-billed Curlew

*Numenius americanus*

American White Pelican

*Pelecanus erythrorhynchos*

Three-toed Woodpecker

*Picoides tridactylus*

Sharp-tailed Grouse

*Tympanuchus phasianellus*

**Bald and Golden Eagles**

Bald Eagles do not nest in the area but are typically inhabitants during migration. The underground mining activities in this application will be limited to development mining only with little or no subsidence anticipated. As such impacts from development mining would be negligible. A raptor survey for the 4th East portal area was conducted in May of 2002. Survey results showed that there were one active, two inactive and one dilapidated Golden Eagle nests on the cliffs in the canyons to the East and Southwest of the proposed permit area expansion. There were no nests within ½ mile of the proposed permit area expansion. The MRP has been updated to include a current (2006) Raptor Survey of the permit area expansion.

**Wetlands and Habitats of Unusually High Value for Fish and Wildlife**

There are wetland areas within the proposed permit area expansion. However, the underground mining activities in this application will be limited to development mining only

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with little or no subsidence anticipated. As such impacts from development mining would be negligible. According to the wildlife map 10-1, appendix A of chapter 9 of the approved MRP there are prairie dogs in the area that may provide nesting habitat for Burrowing owls. Prior to extraction or second mining the MRP must be updated to include a protection plan for wetlands from potential impacts due to subsidence and a burrowing owl survey for the permit area expansion.

Chapter V, page 41 includes a wetland mitigation plan for jurisdictional wetlands. The Division maintains that the plan could be broader in scope in that it to also include areas of high value habitat for wildlife. At this time, the information in the application is considered adequate to meet the requirements of this section of the regulations. However, because the Division and the permittee maintain differing opinions on the level of detail specified under requirements of this sections of the regulations, the Division staff will continue to consult with the permittee and other appropriate representatives to evaluate the scope of the wetland delineation during the forthcoming wetland survey as outlined in the application.

Chapter VIII Page 17a includes a proposal to conduct a Burrowing Owl survey. The survey is scheduled for the most suitable time of the year, or between April 15 and July 15 and prior to full extraction. [03162007]

### **Findings:**

The information in the application is adequate at this time to meet the requirements of this section of the regulations. [03162007]

## **TOPSOIL AND SUBSOIL**

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

### **Analysis:**

#### **Topsoil Removal and Storage**

Topsoil will be protected in-place beneath the topsoil storage pile and the excavated material storage pile (5.35 acres total, according to page VI.B.3-188a). As described in the submittal on page IV-7, the topsoil handling deviated from the norm in the location of the excavated material pile and the topsoil stockpile. The Division invoked R645-301-232.710 and allowed this practice based on the following information:

1. The Excavated material storage pile lies above rock land, Montwel and Castle Valley soils (now correlated to the Hideout Series). These are shallow soils over

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- sandstone bedrock. Average depth to bedrock is twelve inches (page 9 Appendix VII-3). A typical profile of the Hideout Series is described by the NRCS (page C-5, App VII-3) as "A -- 0 – 2 inches; C--2 to 20 inches; R -- 10 inches."
2. The soils will be covered with excavated overburden only, no refuse from roof and floor will be deposited with the excavated material;
  3. Minimal rainfall will limit any leaching of minerals from excavated material to native surface soils.
  4. Cryptogams considered critical to the reclamation of the site would be buried with the in-place soils. Crushing the cryptogams in place seems preferable to removing them entirely from the site, especially since lichen spores would stay in place ready to germinate upon re-exposure to light and moisture (Biological Soil Crusts: Ecology and Management. U.S.D.I. BLM Tech Ref 1730-2. 2001. Sec 4.3.4).

The undisturbed topsoil remains underneath the excavated material stockpile and the topsoil stockpile (pp IV-7 and III-15a). The native ground was left intact and demarcated with four inch wide yellow plastic flagging that was laid down on a ten foot by ten-foot grid (page IV-7).

The Permittee will ensure that excavated material placed on the topsoil does not fall into the category of underground development waste as defined by R645-100 (page IV-8). Storage of topsoil beneath the excavated material pile does not relieve the Permittee from the requirements to protect the topsoil from contaminants. To this end, the submittal describes analysis of the in-place topsoil, prior its use during reclamation (page III-20).

Soil was removed from nine acres (page III-21) and stored as shown on as shown on Plate III-1. The storage pile lies on Persayo/Chipeta complex soils. The topsoil stockpile contains 10,600 cubic yards (page III-21). The topsoil stockpile covers one acre (page VI.B.3-188a).

As noted in Chapter II page 17a, approximately 1,400 cubic yards of topsoil was also stored in berms on the east and west perimeter of the site.

Soil was not removed from one acre of stream channel or the rock outcrop shown in the map created during Mr. Nyenhuis' May 31, 2002 site visit (see Appendix III of Appendix VII-3).

Protection of the stored topsoil is described on page IV-7. The submittal indicates that the topsoil pile was seeded on July 10, 2002 with the (cold season) interim mix #2 outlined in VIII C. 3 of the MRP, containing Russian Wild Rye, HighCrest Crested Wheatgrass, and Fourwing Saltbush. A warm season seed mix was seeded on the berms surrounding the pile. This berm mix consisted of the species listed in the interim mix #1 (outlined in VIII C. 3 of the MRP) and Castle Valley Clover (*Atriplex cuneata*) and Indian Ricegrass (*Oryzopsis*

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hymenoides) was used. A portion of the topsoil pile berm was irrigated where accessible on the southern side of the topsoil pile.

An as-built drawing of the topsoil stockpile is expected upon completion of construction at the site.

### **Findings:**

The information provided meets the minimum requirements for Operations Topsoil Subsoil.

## **VEGETATION**

Regulatory Reference: R645-301-330, -301-331, -301-332.

### **Analysis:**

The topsoil pile at the 4<sup>th</sup> East Portal will be stabilized by seeding and mulching (Chapter IV, page 7). This is a standard practice. However, Emery Deep has never successfully revegetated any disturbance on the permit area using only seeding and mulching methods. Consequently, at the 4<sup>th</sup> East Portal, the top of the pile was gouged and the top and sides of the topsoil pile were hydro seeded with a cool season interim seed mixture. A warm season seed mixture was scattered by hand to the eastern 1/3 of the berm in July of 2002. To the seeded portion of the berm only, the Permittee applied 3.5 inches of water in 2 weeks (Chapter IV, page 7a). Following that, Mr. Seth McCourt, the mine engineer, stated that the town of Emery had three inches of rain in less than a week. Six and a half inches of water applied in 3 weeks seems like an excessive amount of water to apply. This procedure does not seem applicable for a large-scale project. Techniques for irrigating should be refined.

As described on page 4b of Chapter III, the Permittee has agreed to follow a four-phase evaluation of final revegetation plans. In phase 1, the Permittee will investigate and summarize past reclamation sites and practices at the Emery Deep and Hidden Valley Mines. In phase 2, based on those investigations, and in consultation with the Division, the permittee will implement the best techniques demonstrated to be successful. In phase 3, the applied techniques will be evaluated qualitatively annually and quantitatively between the 4<sup>th</sup> and 6<sup>th</sup> year. These evaluations will be correlated to precipitation data results obtained from an on-site weather station and incorporated into the annual report. In Phase 4, the Permittee will revise the MRP to include the best technology for final revegetation. A full scope of work for this four-phased evaluation has been submitted to the Division by the end of March 2003 (Chapter III, Page 4b). A time line for implementation for the four-phase revegetation plans is included in Chapter III page 4-a of the MRP. [03162007]

Vegetation mapping for the permit area expansion was performed by Mt. Nebo Scientific and is included in the application as Appendix XII-2, "Plant Communities of the 1<sup>st</sup> North IBC Area". Community species include shadscale, greasewood and saltgrass. The underground mining activities in this application will be limited to development mining only with little or no subsidence anticipated. As such impacts from development mining would be negligible.

**Findings:**

Information provided in the application meets the minimum Vegetation requirements of the regulations.

**ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES**

Regulatory Reference: 30 CFR Sec. 784.24, 817.150, 817.151; R645-301-521, -301-527, -301-534, -301-732.

**Analysis:**

**Road Classification System**

The Permittee classified all roads in the 4<sup>th</sup> East Portal disturbed area as primary. Those roads are the main coal haulage/Loadout road and the ventilation portal access road.

**Plans and Drawings**

The plans for the roads are given in the submittal. The Division has reviewed the plans and found that they are adequate and meet all the requirements of the regulations.

**Performance Standards**

The Division will inspect the roads to insure that the performance standards are met. If not, the Division will take corrective action.

**Primary Road Certification**

All road designs have been certified by a registered professional engineer.

**Other Transportation Facilities**

The Permittee will build four conveyors at the 4<sup>th</sup> East Portal area. They are as follows:

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- A 54-inch conveyor that transports coal from the mine site to the ROM stockpile.
- A 42-inch conveyor that takes coal from the ROM stockpile to the crusher building.
- A 42-inch conveyor that takes coal from the crusher to the coal stockpile.
- A 42-inch conveyor that takes coal from the coal stockpile to the truck loadout.

### Findings:

The information provided in the amendment is considered adequate to meet the requirements for the road systems and other transportation facilities requirements of the regulations.

## SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

### Analysis:

#### Disposal Of Noncoal Mine Wastes

On page 10 of Chapter II, the Permittee describes how noncoal waste will be handled at the main mine facility. Temporary noncoal waste storage areas consist of two small pits dug into the side of the hill. The pits measure 20' by 40' by 10'. When the temporary storage facilities are full, the noncoal waste will be shipped to a private landfill.

The Permittee will use trash bins at the 4<sup>th</sup> East Portal site. The trash will be hauled from the site and taken to a state approved landfill.

#### Coal Mine Waste

The existing plan calls for coal mine waste, underground development waste to be placed in a refuse pile that is located on the hilltop adjacent to the northwest coal stockpile at the main mine facility. The underground development waste will consist mostly of material encountered from roof fall and development of underground workings.

Coal mine waste at the 4<sup>th</sup> East Portal site will be temporarily stored on site. The Permittee committed to store no more than 20 cubic yards of coal mine waste at the 4<sup>th</sup> East Portal site. Once the 20 cubic yards of material have been accumulated the Permittee will ship the material to the refuse pile.

### **Refuse Piles**

The proposal indicates on Chapter III page 12a that acid-toxic forming material (or refuse) will be disposed of in one of three locations:

1. The permanent underground development waste site; or
2. The abandoned underground mine workings; or
3. The coarse refuse disposal area.

A "proposed coarse refuse disposal area" is in the currently approved MRP and shown on Plate II-2. This coarse refuse disposal area is not located at the 4<sup>th</sup> East Portal breakout, but is located on the hilltop adjacent to the northwest coal stockpile at the main mine facility. However, Chap III page 9 indicates that this coarse refuse disposal area will not be constructed until the Preparation Plant becomes a reality.

The Permittee has estimated on page IV-8 that 93,500 cu yds of rock will be excavated and stored in the excavated material pile at the 4<sup>th</sup> East Portal site. The Permittee anticipates 4,300 cu yds of coal to be extracted during development. The Permittee does not anticipate any refuse to be generated at the 4<sup>th</sup> East portal due too the mine plan dictating that coal will be left in-place in the roof and floor. Any refuse encountered will be hauled to the approved refuse disposal site at the main Emery mine facility. The submittal specifically indicates (page IV 8) that no coal or refuse will be placed in the excavated material pile.

### **Impounding Structures**

The Permittee does not plan to construct impoundments from coal mine waste.

### **Burning And Burned Waste Utilization**

The Permittee will follow the existing plan.

### **Return of Coal Processing Waste to Abandoned Underground Workings**

The Permittee does not plan to return coal-processing waste to abandoned underground workings.

### **Excess Spoil:**

During operations, there will be an excavated material storage pile that will hold approximately 128,000 cubic yards of material (pp II-17a, and IV-8) and cover 4.1 acres (Chap VI.B.3). This material will come from:

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- The development of the airshaft in the southwest corner of the site will generate 520 cu yds of rock (70 ft deep X 16 ft diameter, pp IV-8 and II-17c).
- Excavation of the ramp down to the portal cuts and across the face of the three portals each 8 x 14 on 45-foot centers (93,500 cu yds).
- The temporary diversion construction.
- Construction of the surge stockpile and coal handling facility (cross section B-B' Plate IV-3).
- The sediment pond (IV-8).

The submittal specifically indicates (page IV 8) that no coal or refuse will be placed in the excavated material pile. The Division is emphatic about this requirement due to the fact that:

1. There is a permitted disposal site for refuse within the permit area and,
2. Topsoil being stored beneath the excavated material must be protected from contaminants.

Reclamation of the 4<sup>th</sup> East portal will require grading of 132,149 loose cubic yards of spoil in to the box cut and over the surface to achieve approximate original contour. There will be no excess spoil.

### Findings:

The information provided in the amendment is considered adequate to meet the requirements for spoil and waste materials requirements of the regulations.

## HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

### Analysis:

#### General

The application meets the Operational Plan requirements for General Hydrologic information as provided in R645-301-731. Chapter VI section VI.A of the MRP provides descriptions of the hydrologic resources (surface and ground) within and adjacent to the permit area.

The 4<sup>th</sup> East Portal surface area is located in the southwestern end of Castle Valley. The site sits on the surface of exposed Ferron Sandstone a member of the Mancos Shale. There is very little cover of soil material at the site. A stream channel cuts through the proposed surface facilities. The channel is carved in bedrock of the Ferron Sandstone. The channel is a small tributary to Christiansen Wash, a tributary to Quitcupah Creek. The length of the channel above the portal area is over two miles, Plate VI-12. It will be diverted around the disturbed area via a temporary channel excavated by the Permittee.

The channel is considered ephemeral. The soils consist of fine powdery sand, eroded from the Ferron Sandstone. There is no riparian vegetation in the proposed disturbed area. There is no vegetation in the channel. The site is characterized by sparse stands of juniper trees, small desert shrub and grasses. In some areas the soil is crusted with cryptogams. There is a vegetated channel area below the proposed disturbed area that is being evaluated for wetland status. The site was previously proposed for the sedimentation pond site; however, wetland status is still pending so the Permittee decided to use other sediment control structures as described in previous review sections. The channel will not be disturbed.

With the construction of the 4<sup>th</sup> East Portal area, the potential for physical surface impacts expands. The Permittee has previously described the probable impacts for the mine operation in the MRP p. 171, Chapter VII of 2. Essentially, the mine is changing from an inactive status to an active status. Data gathered over the years of inactive status should be summarized and compared to the PHC to check if conditions have changed. If it is found that the PHC needs modification to describe future impacts, the Permittee should do so.

The Permittee provides surface and ground water information on pages 7-10 of the submitted Chapter XIII. The coal to be mined is located within the upper portion of the Ferron Sandstone. The Permittee states the "complete thickness of the Ferron Sandstone is probably saturated within the IBC area, normally under confined conditions". Figure XIII-2, Upper Ferron Sandstone Potentiometric Surface, 2004/05 on page 6 of Chapter XIII does depict the potentiometric surface of the Upper Ferron Sandstone layer equal to or above the topographic surface within a portion of the proposed IBC area. The Permittee discusses the recharge and discharge areas of the Upper Ferron Sandstone layer and indicates that the dewatering of the Emery Mine represents the largest anthropogenic discharge of groundwater from this geologic unit. Groundwater chemistry is discussed on page 5 of the submitted Chapter XIII. On page 7 of the submitted Chapter XIII, the Permittee discusses the surface water within the IBC area. Flow characteristics of the Christiansen Wash are discussed. In addition, the water chemistry of Christiansen Wash is presented on page 7 as well.

### **Groundwater Monitoring**

The application meets the Operational Plan requirements for Groundwater monitoring as provided in R645-301-731.210. Chapter VI section VI.A.5 describes the groundwater monitoring

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program. Tables are provided outlining sampling frequencies, sampled parameters and site locations. No ground water monitoring will be conducted at the 4<sup>th</sup> East Portal site, other than is already done in accordance with the approved mine plan. No mine water will be discharged from this site, however some water discharged into the 4<sup>th</sup> East Portal will be treated underground and discharged through UPDES discharge outflow 001. Groundwater accumulates in the mine where it is already being monitored via wells and as a discharge site at UPDES discharge sites 001 and 006.

The Permittee has collected baseline groundwater information for the IBC area in conjunction with the existing monitoring program. The Permittee has calculated that mining the IBC as proposed will produce approximately 45 gallons per minute. Five wells and one spring lie within or adjacent to the IBC. An updated potentiometric surface map has been submitted for the IBC. The data used to update is in the Coal Database. The data and map shows the potentiometric surface in the Ferron Sandstone has been drawn down some since Plate VI-9 was developed using 1979 water levels. Some of the wells may be destroyed during mining, however data will be collected from the wells during the mining process. Monitoring wells EMRIA #1 and FC346WW will still be monitored, which lies outside, northeast, of the IBC.

**Surface Water Monitoring**

The application meets the Operational Plan requirements for Surface Water monitoring as provided in R645-301-731.220. Chapter VI section VI.A.5 describes the surface water monitoring program. Tables are provided outlining sampling frequencies, sampled parameters and site locations. A surface water-monitoring plan is already functioning for the mine. There are monitoring sites on Christiansen Wash and Quitchupah Creek for surface flow. There are no surface water monitoring sites on the permit area of the 4<sup>th</sup> East Portal. A UPDES site exists at Sedimentation Pond 009.

**State Appropriated Water Rights**

The application meets the Operational Plan requirements for State Appropriated water supply as provided in R645-301-731.530.

In Chapter VI, 1 of 2, the Permittee provides water right information for the permit and adjacent areas beginning on page 139 and continuing through page 143. Muddy Creek Irrigation Company holds 12 water user claims (94-2, 94-12, 94-32, 94-33, 94-40, 94-47, 94-55, 94-56, 94-57, 94-793, 94-1134 and 94-1135) either within the proposed IBC area or adjacent to it. The water rights are primarily utilized for irrigation purposes.

In Appendix V-3 of Chapter V (2 of 3), the Permittee provides a presubsidence survey. The survey identifies hydrologic resources within permit and adjacent area.

### **Acid- and Toxic-Forming Materials and Underground Development Waste**

The application meets the Operational Plan requirements for Acid- and Toxic- Forming Materials and Underground Development Waste as provided in R645-301-731.300. The Permittee discusses the potential for acid- or toxic-forming materials in the revised PHC document on page 161.

Information concerning acid-and toxic-forming materials in rock at the Emery Mine is presented in Sections V.A.4 through V.A.6 of the MRP. The pH of roof and floor materials ranges from 5.0 to 9.1, with the acid-base potential indicating a net base potential. The alkaline nature of the system is further indicated by the fact that the pH of ground water in the area is typically in the range of 7.0 to 9.5 (see Section V.A.2.7).

Drill Hole FC 702 provides an analysis above and below the I & J coal seams in the 4th East Portal location (page IV-2 through IV-6). This core indicates that the highest Electrical Conductivity and Sodium Adsorption Ratios are in the top ten feet of this material. Selenium and Boron are not a problem in the depths to be excavated. A layer of black sooty coal is encountered at approximately 34 feet. The band is about 6 inches thick and is low in pH (5.2) and has elevated copper (4.0 ppm) and iron content (821 ppm). The submittal specifically indicates (page IV 8) that no coal or refuse will be placed in the excavated material pile.

The Permittee describes acid and toxic forming materials based on information from the MRP. Analyses of roof and floor rock and coal indicate that no acid or toxic contamination will take place from these materials. No surface mining will take in the IBC. There will be no exposure to acid or toxic forming materials.

### **Water-Quality Standards And Effluent Limitations**

The application meets the Operational Plan requirements for Water Quality Standards and Effluent Limitations as provided for in R645-301-722.2. The Permittee operates under a UPDES discharge permit issued by the Utah Division of Water Quality and controls discharges from the mine to be consistent with that permit.

### **Transfer of Wells**

There are no wells within the 4<sup>th</sup> East Portal area. No IBC wells within the IBC will be transferred.

### **Discharges Into An Underground Mine**

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The Permittee describes in Ch. 2, Page 4, how they have constructed a ramp 70 feet below surface to the coal seam. The combined area of the ramp, ROM stockpile, and conveyer total an area of 2.7 acres. Precipitation falling on this area will drain into the mine. The runoff entering the mine will not drain to the sedimentation pond or retention basins. There will be no underground mine discharges in the IBC.

### **Water-Quality Standards And Effluent Limitations**

The Permittee will meet water quality standards by routing undisturbed drainage around the disturbed area and by controlling or capturing disturbed area drainage. The applicant states that monitoring will not be conducted at the 4<sup>th</sup> East Portal site. Since there are no surface or groundwater resources at the site the retention basins and sedimentation ponds have been installed. The Permittee indicates p. 156 that Sedimentation Pond 009 will function as a UPDES monitoring site and will be monitored for the parameters on p. 157, Chapter VI.A.6.

The Permittee plans to use berms to divert undisturbed drainage away from the site and disturbed drainage to retention basins and sedimentation ponds. The plan views and cross-sections of the berms are shown on Plate IV-3, IV-3b, IV-10a, and Figure VI-59.

### **Diversions: General**

The Permittee plans to use berms to keep disturbed drainage on the site and to divert disturbed drainage to retention basins and sedimentation ponds. The plan views and cross-sections of the berms are shown on Plate IV-3, IV-3b, IV-10a, and Figure VI-59.

An undisturbed diversion ditch is planned to divert runoff from a 310.4-acre drainage basin around the disturbed area. The diversion is temporary and designed to handle the runoff from a 10 yr- 24 hr precipitation event plus a one-foot freeboard. The diversion will be excavated in solid sandstone and divert ephemeral runoff flows from the established channel to an adjacent channel. The Permittee has supplied flow and channel design calculations for the undisturbed drainage in the updated submittal. Calculations are based on a SCS Type II storm. Peak flow is calculated to be 50.66 cfs. The temporary diversion is designed using Manning's equation for channel flow. Calculations show the ditch to be designed to transmit 66.11 cfs with a 6-foot wide bottom, 2H:1V side slopes, 4% gradient in solid rock. The Permittee also ran a SedCad 4 using the same channel shape and received a discharge value of 71.3 cfs.

The Permittee shows a culvert on Plate IV-10a that conveys water under the entrance road. Two 18-inch culverts are planned to divert runoff from the disturbed areas under a roadway to the sedimentation pond.

### **Diversions: Perennial and Intermittent Streams**

The MRP meets the requirements for Diversions: Perennial and Intermittent Streams as provided in R645-301-732.300. No diversions of perennial and intermittent streams will occur in connection with mining activity at the Emery Mine.

**Diversions: Miscellaneous Flows**

The MRP meets the requirements for Diversions: Miscellaneous flows. No diversions of miscellaneous flows are proposed for mining activity within the Emery permit area.

**Stream Buffer Zones**

The application meets the Operational Plan requirements for Stream Buffer Zones as required in R645-301-600. The Permittee has produced a plan to mitigate the effects of subsidence on Quitchupah Creek, Christiansen Wash and the alluvial valley floor area on the west side of the permit area by establishing buffer zones in these areas. Plate V-5, Subsidence Monitoring Points and Buffer Zones, depicts a stream buffer zone extending the full length of Christiansen Wash in the areas where full extraction mining will take place. Additionally, a buffer zone has been established in the alluvial valley floor area around Quitchupah Creek. The overburden depth and the angle of draw were used to determine the buffer zone dimensions. The buffer zone for Quitchupah Creek and Christiansen Wash includes an additional standoff distance of 100 ft. on either side.

**Sediment Control Measures**

All precipitation falling on the 4<sup>th</sup> East portal site will flow into the mine, be channeled into retention ponds, directed into Sedimentation Pond #9 or be treated by a silt fence. A combination berms and culverts are proposed to control overland flow on the disturbed area. Plate IV-3 shows an 18-inch culvert at the entrance of the site and a 12-inch culvert below Retention Pond #1.

**Siltation Structures: General**

The Permittee describes the method of installation and placement of silt fences to the 4th East Portal area, Section VI.B.2.4. Silt fences are required on the west and north sides of the disturbed portal area to trap and contain sediment that doesn't report to the sedimentation pond or retention ponds.

**Siltation Structures: Exemptions**

No exemptions for siltation structures have been given.

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### **Discharge Structures**

The Permittee provides sizing and design information for Sedimentation Pond 009. The primary and emergency designs show the designed pond is capable of handling the 5-year sediment storage plus the runoff from the 25 yr-6 hr. design storm.

### **Impoundments**

Plate IV-3 shows the watershed area for Sedimentation Pond 009. Two retention ponds will be constructed: one will contain runoff from the topsoil stockpile and another to contain runoff from the excavated material stockpile. The retention ponds are designed to treat the runoff from a 100 yr-6 hr precipitation event.

The applicant has submitted designs for the sedimentation pond. Designs are based on the SCS runoff Type II rainfall model. The drainage area is 3.2 acres and an average curve number (CN) of 85 was used to account for infiltration. The pond is designed to contain the precipitation event of a 10 yr.-24 hr. precipitation event. The emergency spillway is designed to pass the flow of a 25 yr.-24 hr. precipitation event. Stage storage information has been submitted in a table. The 10 yr.-24 hr. design pool volume contains 0.43 ac-ft of sediment and 0.22 ac-ft of runoff for a total of 0.65-ac-ft. Dewatering of Pond No. 9 will proceed only after a minimum of 24 hours.

The applicant has submitted pond design maps, however, current as-built maps need to be submitted to ensure verification of designs.

### **Casing and sealing of wells**

There are no wells on the 4<sup>th</sup> East Portal area to seal.

### **Findings:**

The information provided in the application is adequate to meet the minimum Hydrologic Resource Information section requirements of the regulations.

## **SUPPORT FACILITIES AND UTILITY INSTALLATIONS**

Regulatory Reference: 30 CFR Sec. 784.30, 817.180, 817.181; R645-301-526.

### **Analysis:**

The Permittee lists the support facilities in Chapter II and on Plate II-3, 4 East Portal Surface Facilities. The information in the PAP shows the location of each structure and a brief description. All of the structures in the 4<sup>th</sup> East Portal disturbed area with the exception of a subsidence monument are post-SMCRA.

**Findings:**

The Permittee has met the minimum regulatory requirements for the support facilities section of the TA.

**SIGNS AND MARKERS**

Regulatory Reference: 30 CFR Sec. 817.11; R645-301-521.

**Analysis:**

The Permittee is required to place signs and markers as outlined below:

- Signs and markers shall: be posted, maintained, and removed by the person who conducts the underground mining activities; be of a uniform design throughout the activities that can be easily seen and read; be made of durable material; and, conform to local laws and regulations. Signs and markers shall be maintained during all activities to which they pertain.
- Mine and permit identification signs shall be displayed at each point of access from public roads to areas of surface operations and facilities on permit areas for underground mining activities. Signs will show the name, business address, and telephone number of the person who conducts underground mining activities and the identification number of the current regulatory program permit authorizing underground mining activities. Signs shall be retained and maintained until after the release of all bonds for the permit area.
- Perimeter markers shall clearly mark the perimeter of all areas affected by surface operations or facilities before beginning mining activities.
- Buffer zones shall be clearly marked to prevent disturbance by surface operations and facilities.
- Topsoil markers shall be used where topsoil or other vegetation-supporting material is segregated and stockpiled.

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In Section UMC 817.11 of the MRP the Permittee commits to place signs and markers as outlined above.

### **Findings:**

The Permittee has met the minimum requirements of signs and markers section of the regulations.

## **USE OF EXPLOSIVES**

Regulatory Reference: 30 CFR Sec. 817.61, 817.62, 817.64, 817.66, 817.67, 817.68; R645-301-524.

### **Analysis:**

#### **General Requirements**

Appendix IV-9 was incorporated into the MRP on May 7, 2002. The amendment deals specifically with blasting used to open up the 4<sup>th</sup> East Portal area. The approved plan is good between April 15, 2002 and October 1, 2002. Since the Permittee had a valid blasting plan for the 4<sup>th</sup> East Portal area a new blasting plan was not required as part of this amendment.

### **Findings:**

The Permittee has met the minimum requirements of the explosives section of the regulations.

## **MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS**

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

### **Analysis:**

#### **Affected Area Maps**

The Division usually considers the affected area as those areas where the Permittee plans to mine as part of the expected life-of-mine. The reason for the expected life-of-mine area is so that the Division will have a heads up on what future activities will occur. In addition, the Division can instruct the permittee on what type of actions should be taken know to prevent long delays in the permitting process.

The Permittee did include several maps that show the location of the permit boundaries. The Division considers that information adequate.

The affected map area of the IBC is shown on Plate XII-1. All maps in the MRP that show the permit area need to be updated to include the IBC area. Plate XII-1 in conjunction with existing and geological and hydrologic maps was used to identify potential impacts to surface and ground water in the vicinity of the IBC.

#### **Mining Facilities Maps**

The Permittee give the Division a surface facilities map for Emery Deep Mine<sup>4<sup>th</sup></sup> East Portal disturbed area. Plate II-3, 4<sup>th</sup> East Portal Surface Facilities, shows the location of the mine facilities. A professional engineer has certified the maps. No mine facilities will be constructed on the surface of the IBC site.

#### **Mine Workings Maps**

The Permittee included mine maps in various submittals. The maps show the location of the proposed underground workings. Plate XII-1 was used to identify the location of mine workings. The Permittee did commit to include that map in the as-built submittals.

#### **Monitoring and Sampling Location Maps**

The Permittee has identified dewater pipes on Plate IV-3 where discharge samples will be required when discharge occurs.

#### **Certification Requirements**

The Permittee has met the minimum requirements for map certification.

#### **Findings:**

The information submitted by the Permittee was sufficient to make geological and hydrologic decisions. This submittal was treated as an emergency issue due to the time constraints the operator has to start mining activities in the IBC section or lay off miners until all maps have been completed. All maps showing the permit area in the MRP need to be updated with the boundaries of the IBC.

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## GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

### Analysis:

The demonstration test plot was constructed in 1984 and reworked in 1987 in an effort to determine successful revegetation techniques for use on subsoils derived from the Mancos Shale. The chemical characteristics of the soils in this plot are described with the Vegetation Data in the 1991 Annual Report. They are extremely sodic, with average values in the top six inches of 9.3 pH and 19.8 SAR. The variables tested in the plots were:

- topsoil and no topsoil treatments;
- irrigation and no irrigation treatments;
- mulch and no mulch treatments;
- furrows and no furrows; and
- mature versus containerized transplants.

The demonstration test plots were evaluated in 1989 and 1990 by Richard Denning and David Larson of Consolidation Coal Company. The results of the evaluation are included in the Annual Reports for 1988 and 1989. Mortality of transplants and containerized plants was high. At the end of the monitoring period, the 33% of the mature transplants survived and 10% of the containerized transplants were living. The most successful plots were those that received mulch and contained shallow depressions. Thus, the test plots emphasize that the most important variable is the availability of water. Water not only irrigates the plants, but also leaches the salts from the soil.

The Permittee has committed to evaluating the reclamation practices used at the mine site thus far and to revise the MRP with the best practices available (Chap III, page 4a).

Page 10 of the Chapter XIII discusses the reclamation plan for the proposed IBC area. The proposed IBC expansion plan does not propose any new surface disturbances as a result of mining. As such, no additional land reclamation will be required.

**Findings:**

The information provided is meets the General Requirements of the Regulations for the purposes of this amendment.

**APPROXIMATE ORIGINAL CONTOUR RESTORATION**

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

**Analysis:**

The definitions of AOC contained in the Surface Mining Control and Reclamation Act (SMCRA) and the Utah coal rules are primarily statements of the objectives of post-mining backfilling and grading so that the area "closely resembles the general surface configuration of the land prior to mining" and "blends into and complements the drainage pattern of the surrounding terrain". At the same time, reclamation performance standards must be met, including controlling erosion, establishing mass stability and establishing permanent, diverse and effective vegetative cover. In some circumstances, replicating the original contour may only be possible at the expense of one or more reclamation performance standards. In other circumstances, it may be possible to achieve nearly exact original contour and simultaneously satisfy all the other regulatory requirements. Although the principles of regulatory construction suggest that specific regulatory requirements take precedence over general provisions, this directive is intended to reconcile the specific performance standard requirements of the regulatory program with the general definitions of AOC in a way that accomplishes the objectives of SMCRA.

The underlying objectives of the AOC requirements relate to the assumption that post-mining features which mimic pre-mining features are most likely to quickly achieve mass and erosional stability, revegetation, hydrologic balance and productive post-mining land use, all of which are the objectives of the reclamation performance standards. AOC also addresses aesthetic considerations. In order to evaluate methods for achieving AOC, the underlying objectives and challenges of reclamation at the site in question must first be identified.

*Final Surface Configuration*

The main question that is used to determine if the site meets this requirement is "Does the post-mining topography, excluding elevation, closely resemble its pre-mining configuration?" The Division relies on the judgment of the technical staff that reviews the reclamation plan. The staff reviewed the pre-mining and post mining topographic maps and cross sections and determined that this condition is met based on the following:

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- The pre-mining and post-mining topography are shown on Plate III-5. The main differences between the pre-mining and post-mining topography is that the post-mining contours are smoother. However, pocking and other surface roughening techniques tend to make the post-mining surface look more natural after a few years.
- The pre-mining and post-mining cross-sections shown on Plate IV-3, IV-3a and IV-3b shows those pre-mining and post-mining contours will be similar. The highwalls will be located in the lower section of the ramp area and will be eliminated.

### *All Spoil Piles to be eliminated*

No spoil piles are associated with this site.

### *All Highwalls to be eliminated*

The highwalls will be located at the bottom of the ramp. The ramp will be completely backfilled during final reclamation.

Because the highwalls areas will be restored to approximate pre-mining topography the Division finds that the highwall elimination plans meets the minimum requirements of R645-301-553.120.

### *Hydrology*

The main concerns with hydrology are that the drainages are restored, sediment is controlled and that no hazardous or toxic discharges will occur. The Division considers that those conditions will be met when the hydrologic reclamation requirements are met.

### *Post-Mining Land Use*

No surface disturbance is planned for the IBC. No rapid subsidence is planned. Pillars will be left to support the overlying strata. Over long periods subsidence could take place. The Permittee has a reclamation plan in the MRP to mitigate subsidence impacts. The Division has found that the application meets the general post-mining land use requirements.

### *Variance from AOC*

The Permittee did not request a variance from AOC.

### *General Backfilling and Grading*

The Division analysis of the general backfilling and grading requirements is in the backfilling and grading section of this TA. The Division has found the general backfilling and grading requirements are satisfied.

#### **Findings:**

The Permittee has met the minimum requirements for the reclamation Approximate Original Contour section of the TA.

## **BACKFILLING AND GRADING**

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

#### **Analysis:**

The 4<sup>th</sup> East Portal will be graded to approximate original contour, with a slight mounding (2.5 - 3.0feet) over the area of the box cut (page III-15a), due to a 20% swell factor. All coal waste will be placed in the bottom of the box cut (Worksheet 1 in Chap IV). Material from the excavated material pile will be placed in three-foot lifts into the box cut and compacted by the passage of heavy equipment. The Worksheet indicates that the last three lifts will not be compacted. Large boulders (3 ft diameter or larger) will be separated and used for the construction of the stream channel and habitat enhancement.

Topsoil stored in the topsoil pile and in the berms around the topsoil pile as well as the berms on the east and west perimeter of the disturbed area will be applied to nine acres where topsoil was removed (Chap IV Worksheet 1 Earthmoving Activity). The separation of topsoil in berms from the general fill is also itemized in the Bonding Table in Chapter IV Worksheet 1). The Worksheet indicates segregation of the surface two inches of the surface of the topsoil pile for topdressing on the re-spread topsoil. The nine acres receiving topsoil will be surface roughened with a 416 backhoe. The five acres of land re-exposed after removal of the material excavation pile will be ripped to twelve inches with spacing of two feet using a Cat D6 with 3-shank ripper.

#### **General**

The general backfilling and grading requirements are as follows:

*Achieve AOC*

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The AOC issues are discussed in the AOC section of this TA. The Division made the finding that the reclamation plan is adequate to insure that the site can be reclaimed to the approximate original contour requirements.

The Permittee provided the Division with a table that shows the cuts and fills that will occur during final reclamation. The Division's may concern is that swelling will increase the volume of material and the Permittee will be unable to place all the backfill material within the disturbed area. On Table III-1 the Permittee shows the cut and fill requirements. The excess material will be used as general backfill. The results will be that the average pot-mining surface will increase in elevation by 2.8 feet. The Division considers that amount minor.

*Elimination of Highwalls Spoil Piles and Depressions*

Highwall elimination is discussed in the AOC section of this TA. The highwall are located at the bottom of the ramp. The ramp will be completely backfilled and graded so the highwalls will be eliminated. See Plate IV-3 for cross-section of the pre-mining and post-mining ramp and Plate III-5 for pre-mining and post-mining contours.

No spoil piles will be associated with the site. No major depressions will be present after reclamation. Minor depressions (pocks) may be left after topsoil placement to stabilize the surface and retain moisture. The pocks generally fill in within a few years.

*Slope Stability*

In Chapter III Page 15a, the Permittee show the results of a slope stability analysis for the reclaimed areas at the 4<sup>th</sup> East Portal area. The post-mining slopes range in steepness from 20H:1V to 2H:1V. The minimum slope stability requirement for all reclaimed areas is 1.3 or greater.

*Minimize Erosion and Water Pollution*

The review of the erosion and water pollution plans is in the hydrology section of the TA.

*Post-Mining Land Use*

The post mining land-use finding is in the post-mining land use section of the TA.

*Settled and Revegetated Fills*

The variances from AOC and other requirements for existing spoil or underground development waste do not apply to the 4<sup>th</sup> East Portal area.

*Spoil Disposal*

No spoil will be generated on site.

*Disposal of Coal Mine Waste and Underground Development Waste*

The Permittee addresses how coal mine waste and underground development waste will be handled at the 4<sup>th</sup> East Portal area. That issue was deal with in other sections of the TA.

*Exposed Coal Seams and Acid- and Toxic-Forming Materials and Combustible Materials*

The coal will be exposed at the airshaft and the portals. Those areas will be backfilled with more than 4 feet of cover.

*Cut and Fill Terraces*

The Permittee does not propose to use cut and fill terraces at the 4<sup>th</sup> East Portal area.

*Final Preparation of Graded Surfaces*

The proper preparation of the graded surface is a performance standard that the Permittee must meet during reclamation.

**Previously Mined Areas**

No previous mining has occurred at the surface of the 4<sup>th</sup> East Portal areas.

**Backfilling and Grading On Steep Slopes**

No steep slopes exist at the 4<sup>th</sup> East Portal area.

**Special Provisions for Steep Slope Mining**

The Permittee did not request any special provisions for steep slope mining.

**Findings:**

The information provided in the amendment is considered adequate to meet the requirements for backfilling and grading requirements of the regulations.

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**MINE OPENINGS**

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

**Analysis:**

The Permittee has committed to seal and backfill all portals. The seals will be MSHA approved and the backfill will be a minimum of 25 feet. In addition to the 25 feet of backfill the portal area will be backfilled and graded as part of the reclamation work. The shaft will be completely backfilled.

**Findings:**

The Permittee has met the minimum requirements for the mine opening section of the TA.

All roads within the 4<sup>th</sup> East Portal area will be reclaimed. The road surface will be crushed rock or gravel. That material will be used for backfilling.

**TOPSOIL AND SUBSOIL**

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

**Analysis:**

**Redistribution**

Chapter III, page 20 discusses the topsoil application to the re-graded surface as follows:

- The graded land will be surface roughened prior to re-spreading topsoil either by ripping or gouging or both.
- Topsoil will be redistributed with front-end loaders and dump trucks.
- Topsoil will be graded to the approximate depth using dozers and backhoes.
- Stakes will be used to determine the final topsoil grade.
- Topsoil will be analyzed according to Table 1 of the Division Guidelines (1988) prior to seeding.
- If cryptogams are harvested, they will be re-applied after seeding to selected locations (such as depressions).
- The site will be seeded with a warm season mixture described in Chapter VIII.C.4.

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The in-place topsoil, stored beneath the excavated material will be sampled and analyzed during final reclamation for the chemical parameters listed in Table 6 of the Division's 1988 Topsoil and Overburden Guidelines (Chap III, page 20). The topsoil stored in the topsoil pile and in berms will be analyzed for Nitrogen, Phosphorus, Potassium and texture.

The Permittee calculates that 12,000 cu yds replaced over nine acres of disturbed area will provide nearly ten (9.9) inches of replaced topsoil (Chapter III, page 21 and Chap IV, Worksheet 1).

The submittal indicates that the soils will be handled on when they are in a loose or friable condition or when the moisture content is an optimal 10 – 15% (Chap III, page 20).

The plan indicates in Chapter III, page 4a that a new reclamation plan will be developed for the surface disturbed area, based upon an analysis of past treatments and practices. The plan will be compiled during 2007 and submitted with the 2007 annual report. [03142007]

### **Findings:**

The information provided meets the minimum required for Reclamation Topsoil and Subsoil.

## **ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES**

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

### **Analysis:**

#### **Reclamation**

All roads in the 4<sup>th</sup> East Portal area will be reclaimed as part of the general backfilling and grading plan. The road surface will be crush stone or gravel and will be used as backfill material.

#### **Retention**

No roads in the 4<sup>th</sup> East Portal area will be retained.

### **Findings:**

The Permittee has met the minimum requirements for the reclamation road section of the regulations.

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## **HYDROLOGIC INFORMATION**

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

### **Analysis:**

#### **General**

Reclamation of the 4<sup>th</sup> East Portal is described in Chapter III.C.2. When mining is complete the Permittee intends to remove the facility structures, then regrade the surface to approximate original contour. The Permittee marked the surface with flagging prior to developing the topsoil stock and rock waste piles. Upon reclamation the fill material will be removed to relocate the original contour of the channel and surrounding area.

The portals will be sealed and backfilled. The temporary undisturbed diversion channel will be backfilled and the surface flows directed to the original course. The Permittee has not provided details for backfilling to ensure compaction. The applicant proposes to compact the fill material in the ramp and ROM stockpile area to minimize percolation of surface waters into the cut.

There will be no surface disturbance in the IBC, thus no surface reclamation for this site. Some wells may be destroyed during mining of the IBC. The Permittee has committed to replace all well used for water use. Sampling wells will not be replaced, however other wells outside the IBC will still function, and they will be used and maintained. Water monitoring data is sent to the Coal Mining Database. There is currently over 25 years of data for most sites in and adjacent to the IBC.

#### **Surface-water monitoring**

The stream channels on and adjacent to the 4<sup>th</sup> East Portal are ephemeral. No monitoring is planned after reclamation. The water-monitoring plan currently being conducted will continue which monitors waters below the 4<sup>th</sup> East Portal on Christiansen Wash.

Utah Coal Rules require the Permittee to show no additional settleable solids are degrading the stream channels below the reclaimed site prior to bond release.

#### **Transfer of wells**

No wells exist in the 4<sup>th</sup> East Portal area to be reclaimed. No wells will be transferred.

### **Discharges into an underground mine**

Discharge into underground openings will be prevented, because plans have been mandated necessary for the Permittee, to grout or apply a cement type of material to form a non-filtering layer below the surface to prevent infiltration of the channel flows.

### **Water quality standards and effluent limitations**

Sediment control structures will be maintained until no longer needed. Water quality sampling will continue below the site until final bond release.

### **Diversions**

The Permittee commits to reclaiming all diversions.

### **Sediment control measures**

The Permittee will maintain sediment control facilities through reclamation.

### **Sedimentation ponds**

The sedimentation pond will be removed during the final reclamation phase as identified in the reclamation table in Chapter III.

### **Ponds, Impoundments, Banks, Dams, and Embankments**

The Permittee has submitted a reclamation schedule in Chapter III. The schedule identifies the sequence or hydrologic structure removal in sequence of mine reclamation.

### **Hydrologic Reclamation Plan**

The operator has submitted a hydrologic reclamation plan in the MRP. No surface disturbance will take place in or adjacent to the IBC.

### **Findings:**

The Permittee has supplied sufficient information in the application to meet the minimum Hydrologic Information of the Reclamation section.

RECLAMATION PLAN

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## CONTEMPORANEOUS RECLAMATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.100; R645-301-352, -301-553, -302-280, -302-281, -302-282, -302-283, -302-284.

### Analysis:

#### General

The Borehole site and the Flume site were reclaimed in 1984. Mulching appears to have been one of the treatments. The last evaluation of the site is in the 1991 Annual report. The most frequently encountered species at the Flume site were *Atriplex canescens* (Four Wing Saltbush) and *Salsola kali* (Russian Thistle).

According to the 1988 Annual Report, mat saltbush was transplanted to the Borehole site in 1987. The most recent monitoring of the Borehole site (1990) indicates that of the three of the twenty mat saltbush transplants survived. Species most frequently encountered at the Borehole site were *Bouteloua gracilis* (Blue Grama); *Atriplex sp.*; and *Halogeton glomeratus*.

The 1990 Annual report indicates that the Borehole Pump #3 and Sedimentation Pond #6 were built in the spring of 1989 and were seeded after construction without mulching. The initial seeding was unsuccessful. The areas were reseeded in October of 1991. As described in the 1991 Annual report, the following steps were taken in reseeding the topsoil piles and pipeline right of way:

- creation of depressions 4 – 5 feet square and six inches deep;
- discing the soil;
- seeding and mulching the soil by hand;
- then re-discing to crimp the 2 Tons/ac native hay mulch.

The reseeded topsoil piles were evaluated in November 1993 by Paul Baker, Reclamation Biologist for the Division:

*Best growth on all three piles is on the top where it is relatively flat. There is also a limited amount of growth in the gouges that were made on the sides of the slopes. Even though some plants appear to have become established, plant density is still low...Disturbance of the piles has led to growth of more halogeton and kochia than was present in 1991. The native grasses have not grown sufficiently that they can be identified...Shrubs that I found are winterfat, shadscale, and fourwing saltbush. Winterfat was by far the most prevalent of the shrubs. I did not see any seeded forbs...*

**Findings:**

The information provided in the application considered adequate to meet the minimum Contemporaneous Reclamation section requirements of the regulations.

**REVEGETATION**

Regulatory Reference: 30 CFR Sec. 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

**Analysis:**

**Revegetation: General Requirements**

Vegetation reference areas were established and quantitatively sampled in 1980 by Stoecher-Keammerer & Associates of Boulder, Colorado. The mixed desert shrub reference area had a vegetative cover of 10.6 percent (Chapter VIII, page 19). The raw data is not included in the Mining and Reclamation Plan (MRP). Eleven percent vegetative cover is low from the Division experience in observing vegetative cover on other adjacent sites. However, the reference area and 4<sup>th</sup> East Portal disturbed area compare equally based on the Division's visual observations. The vegetative cover of the reference area will be re-measured at the same time as the reclaimed disturbed area by the same observer according to the revegetation guidelines.

The MRP discusses standard revegetation methods to be used at final reclamation. In 20 years Emery Deep Mine has not stabilized any disturbance on the permit area with vegetation. Because of this, the Permittee has committed to study past and future reclamation techniques as described in the Operation Plan, Vegetation section of this technical analysis and as described in Chapter III, Page 4b of the MRP. Demonstrating that the site can be reclaimed is important to obtaining future approval for site disturbance. Rock mulch, windbreaks, transplants, irrigation and/or amendments may be required to establish vegetation. The timing of seeding and seasonality of the species may be of importance and should be correlated to the timing of precipitation (July through October as established in the Environmental Resource Climatological Section of this Technical Analysis). Repeated and continuous efforts at the Hidden Valley Mine and Emery Deep Mine must be made until vegetation is established on the soil stockpiles and at interim vegetation sites.

**Findings:**

Information provided in the application and MRP is adequate to meet the minimum Revegetation requirements of the regulations.

## RECLAMATION PLAN

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### STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

#### **Analysis:**

Chapter II page 23 describes the use of gouging to provide protection from wind erosion. This page also describes the plan to separately harvest cryptogams and re-apply them to the surface of topsoil stockpiles in an effort to provide a source of spores and mycelium during reclamation.

The Permittee indicates in the submittal that large rocks will be strewn across the reclaimed surface for wildlife habitat. These rocks will also serve as windbreaks. The Permittee has indicated in Chapter III, page 4a that an evaluation of the best revegetation methods will ensue and improvements would be made on the methods outlined in the MRP as a result. These improvements will be reviewed for their erosion control potential by the Division.

#### **Findings:**

The information provided is adequate for the purposes of Reclamation Stabilization of Surface Areas.

### MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

#### **Analysis:**

##### **Affected Area Boundary Maps**

The affected area should include all areas that are proposed to be affected over the estimated total life of all mining and reclamation activities. All mining and reclamation activities associated with the 4<sup>th</sup> East Portal area will be within the permit boundaries. The permit boundaries are shown on several maps in the PAP.

##### **Bonded Area Map**

Plate III-5 show the bonded area map for the 4<sup>th</sup> East Portal area.

**Reclamation Backfilling And Grading Maps**

Plate III-5 shows the reclaimed contours for the 4<sup>th</sup> East Portal area. Cross-sections for the area are shown on Plate III-3, Plate III-3a and Plate III-3b.

**Reclamation Facilities Maps**

Plate III-5 shows the location of the County road that will be left after final reclamation.

**Final Surface Configuration Maps**

Plate III-5 shows the reclaimed contours for the 4<sup>th</sup> East Portal area. Cross-sections for the area are shown on Plate III-3, Plate III-3a and Plate III-3b.

**Certification Requirements.**

All maps and cross-sections that are required to be certified by a registered professional engineer have been.

**Findings:**

The Permittee has met the minimum requirements for the reclamation maps and cross-sections of the TA.

**BONDING AND INSURANCE REQUIREMENTS**

Regulatory Reference: 30 CFR Sec. 800; R645-301-800, et seq.

**Analysis:**

**Determination of Bond Amount**

The Division has calculated the reclamation cost for the Emery Deep mine and found that that the bond amount exceeds the reclamation cost estimate. The Division has calculated the reclamation costs to be \$1,920,000 in 2005 dollars. The current bond held by the Division for the Emery Deep Mine is \$3,454,443. Therefore, the bond amount is adequate. A copy of the reclamation cost estimate is available from the Division.

**Findings:**

**RECLAMATION PLAN**

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The information provided in the amendment is considered adequate to meet the requirements for bonding and insurance requirements of the regulations.

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**RECLAMATION PLAN**

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## REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

### PRIME FARMLAND

Regulatory Reference: 30 CFR Sec. 785.16, 823; R645-301-221, -302-300 et seq.

#### Analysis:

##### **Prime Farmland Application Contents**

The prime farmlands within the federal IBC are noted on Plate XIII-1a. These lands will not be disturbed by "Coal Mining Operations." No further information on redistribution of soil is required.

##### **Consultation with Secretary of Agriculture**

Division consultation with the NRCS concerning the prime farmland status irrigated lands within the federal IBC is in process. [03142007]

#### Findings:

Prime farmland may be affected by "Surface Operations and Impacts Incident to an Underground Coal Mine," but not by "Coal Mining Operations." For monitoring and mitigation plans, see discussion under Subsidence.

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**REQUIREMENTS FOR PERMITS**

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## **CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT (CHIA)**

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

### **Analysis:**

The MRP meets the Reclamation Plan requirements for Cumulative Hydrologic Impact Assessment (CHIA) as provided in R645-301-731. The IBC area is shown as Prime Farmland in Important Farmlands of Parts of Carbon, Emery, Grand, and Sevier Counties. 1981. Utah Ag Exp Sta Res Rpt No. 76. One third of the acreage within the federal IBC and approximately 20 acres in the fee IBC are prime farmland when irrigated. The PHC acknowledges that a subsidence related drop in the ground surface might lower the land from 3 – 10 feet within the area shown on Plate V-5.

[03142007]

### **Findings:**

The information provided met the requirements for the Division to accurately assess the Cumulative Hydrologic Impact of mining.

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**CHIA**

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**APPENDICES**

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**APPENDICES**

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**APPENDICES**

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**SUMMARY OF COMMITMENTS**

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**SUMMARY OF COMMITMENTS**

The summary below presents a list of commitments stated within the mining and reclamation plan (MRP). This list provides the following information for each commitment, when applicable:

- Title.
- Objective.
- Frequency.
- Status.
- Reports.
- Citation.

**BEGIN COMMITMENT LIST BELOW**

**R645-301-525.100 et seq, Pre Subsidence Survey.** •Title: 1<sup>st</sup> North IBC Pre-Subsidence Survey. •Objective: 1) Show State appropriated water, irrigation ditches, direction of water flow, location and type of existing structures (ponds, corrals) and renewable resource lands (identify prime farmlands) in the 1<sup>st</sup> North IBC (and Fed lease U50044 not yet included in MRP). 2) Identify subsidence-monitoring point within Christiansen's surface owned prime farmlands. •Frequency: Conduct survey prior to development of panels in 1<sup>st</sup> North IBC. •Status: Pending. •Reports: Amend current pre-subsidence information in Chap V Appendix V-3 and update Plate XII-1 with subsidence monitoring information and monitoring point on Christiansen surface. •Citation: Chap. XII. Sec. C.2

**R645-301-525.700, Public Notice of Proposed Mining.** •Title: 1<sup>st</sup> North IBC. •Objective: The Permittee must notify surface owners six months prior to mining beneath their surface. The nineteen acres of private ground owned by Kenneth L. and Earlene Christiansen, has been determined to be prime farmland (Sec 22, SE1/4NW1/4, see Plate I-1 Surface Ownership Map). •Frequency: Ongoing. •Status: Pending. The Christiansen land is scheduled to be undermined in 2006 and 2007. •Reports: Provide Division with evidence of notification. •Citation: Chap V. B. and Plate XII-1.

**R645-302-313, Prime Farmland. Application Contents—Reconnaissance Inspection.** •Title: NRCS prime farmland determination letter (expected imminently). •Objective: NRCS letter will be placed in Appendix XII-2. Subject of letter is irrigated Penoyer Loam prime farmland in T. 22 S., R. 6 E., SLBM, Sec 22, SE1/4NW1/ 4 owned by Christiansen. •Frequency: when received from NRCS. •Status: Pending. •Reports: Incorporate into Appendix XII-1 using C1C2 form. •Citation: Chap XII. Sec. C.2.

**SUMMARY OF COMMITMENTS**

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**PERMIT INFORMATION TABLE**

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**PERMIT INFORMATION TABLE**

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**Lower Quitchupah Creek Watershed  
CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT  
(CHIA)**

**For**

**EMERY DEEP MINE  
C/015/0015**

**In**

**EMERY COUNTY, UTAH**

**March 16, 2007**



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## INTRODUCTION

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### I. INTRODUCTION

The Lower Quitchupah Creek Cumulative Impact Area (CIA) is located in Emery County, Utah approximately 10 miles south of the town of Emery. There is currently one active mine in the Lower Quitchupah Cree CIA- Consolidation Coal Company's Emery Deep Mine. A 160 acre incidental boundary change (IBC) expansion of the Emery Deep Mine facilitated this review and update of the Lower Quitchupah Creek Cumulative Hydrologic Impact Assessment (CHIA).

The Division has the responsibility to assess the potential for mining impacts both inside and outside permit areas. The CHIA is a findings document prepared by the Division that assesses whether existing, proposed and anticipated coal mining and reclamation operations have been designed to prevent material damage to the hydrologic balance outside the permit areas. The Division cannot issue a permit to a proposed coal mining operation if the probable, anticipated hydrologic impacts will create material damage to the hydrologic balance outside the permit area. The CHIA is not only a determination if coal mining operations are designed to prevent material damage beyond their respective permit boundaries when considered individually, but also if there will be material damage resulting from effects that may be acceptable when each operation is considered individually but are unacceptable when the cumulative impact is assessed.

The objective of the CHIA document is to:

1. Identify the Cumulative Impact Area (CIA) (Part II)
2. Describe baseline conditions in the CIA; (Part III)  
Identify hydrologic systems, resources and uses;  
and document baseline conditions of surface and  
ground water quality and quantity
3. Identify hydrologic concerns (Part IV)
4. Identify relevant standards against which predicted (Part V)  
impacts can be compared
5. Estimate probable future impacts of mining activity (Part VI)  
with respect to the parameters identified in Part IV
6. Assess probable material damage (Part VII)
7. Make a statement of findings (Part VIII)

This CHIA complies with the federal Surface Mining Control and Reclamation Act of 1977 (SMCRA) and subsequent federal regulatory programs under 30 CFR 784.14(f), and with

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Lower Quitchupah

## INTRODUCTION

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Utah regulatory programs established under Utah Code Annotated 40-10-et seq. and the attendant State Program rules under R645-301-729.

**CUMULATIVE IMPACT AREA**

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## **II. CUMALATIVE IMPACT AREA (CIA)**

Reviewing Permit Application Packages (PAP's) and Mining and Reclamation Plans (MRP's) alone is not sufficient to assess impacts to the geologic and hydrologic regimes. Specific knowledge of the geology and hydrology is crucial in assessing the dynamics and interactions of chemistry, surface- and groundwater movement and surface disturbance and subsidence impacts associated with the mine sites. The Division uses pertinent information from many sources including federal and state agencies; geological and hydrological reports; textbooks and other publications; site visits; and a knowledge base built on experience and training.

Plate 2 delineates the CIA for current and projected mining in the Lower Quitchupah Creek watershed area. The CIA for the current and projected mining in the Lower Quitchupah Creek is approximately 11,003.2 acres. The Emery underground mine is located in the Quitchupah Creek watershed, approximately 10 miles south of Emery, Utah. The surface facility for the mine is located at the confluence of two perennial streams, Quitchupah Creek and its tributary, Christiansen Wash. Quitchupah Creek, with a drainage area of 430 square miles, flows to the southeast from the mine complex, converging with Ivie Creek, immediately above the confluence of Ivie Creek and Muddy Creek at Highway 1-70. Muddy Creek, with a drainage area of 1,450 square miles, is one of the major streams in the Dirty Devil River watershed, a tributary to the Upper Colorado River. Flows in Quitchupah Creek and Christiansen Wash derive from three sources: direct runoff; baseflow from the Upper and lower Ferron Sandstone aquifers; and returning irrigation flows that are diverted out of Muddy Creek. Quitchupah Creek is also directly impacted by discharge from the mine as all mine-inflow pumped from the underground workings is directed to a single treatment pond that discharges into a small tributary of that stream.

The Lower Quitchupah Creek CHIA (Emery Deep CIA) encompasses watersheds contained within the Quitchupah-Muddy Creek CHIA (Sufco CIA). The Sufco Mine's permit and CIA include portions of the Christiansen Wash and Quitchupah Creek watersheds. The Sufco Mine complex is located within the Wasatch Plateau approximately 12 miles northwest of the Emery Deep facility. The Sufco Mine is considered sufficiently removed hydrologically that it will not adversely impact surface and ground water quality and quantity of the permit area and CIA. Therefore, it is not viewed as a factor in the cumulative impact assessment. This assumption is made on the basis of geologic and hydrostratigraphic. At the Sufco complex, mining will take place within the Blackhawk Formation. The areal aquifer to be affected at the Sufco Mine consists of sandstone units within the Blackhawk; at the Emery Mine, the Blackhawk Formation is not present. The Bluegate Shale comprises the surface geology formation at the Emery Mines and if present, the Blackhawk would be situated several thousand feet stratigraphically above the Bluegate Shale. The Sufco Mine is located in the highlands of the Wasatch Plateau, whereas the Emery complex is located on the outwash plain east of the Wasatch Plateau; there is several thousand feet of elevation difference between the two mines. In regard to surface water concerns, the quality of water being discharged from the Sufco mine is

comparable to the natural outflow from the areal aquifer. As such, measurable increases in downstream total dissolved solids (TDS) levels and the flow in Quitchupah Creek in the vicinity of the Emery Mine are not anticipated.

### **SCOPE OF MINING**

Mining is conducted in the I-J zone coal bed, in the Ferron Sandstone member of the Mancos Shale. Development of the mine is accomplished with seven or eight entry mains with entries on 80 foot centers and crosscuts on 100 foot centers. The submains for panel development typically use a five entry system with similar entry centers. Panels are developed off the mains or submains with a four or five entry system with rooms drivein on either side of the development entries.

The Emery Mine utilized a system of partial secondary extraction where the barrier pillars were split. The Emery Mine did not employ full extraction techniques until the mining of the First South Pannel. Additionally, full extraction techniques were utilized at the 4<sup>th</sup> East Portal. In order to obtain maximum economic recovery (MER) of the coal resource for the 160 acre incidental boundary change (IBC) permitted by the Division in March of 2007, full extraction techniques were required by the Bureau of Land Management (BLM). During the term of the Emery Mine permit, the planned production is 1.7 million tons per year. The mine will produce this coal with five continuous miner sections. Producing at this rate, the mine will continue operations until 2010 at which time the I-J Zone will be mined out. At that time, final reclamation operations will begin.

### **III. HYDROLOGIC SYSTEM AND BASELINE CONDITIONS**

The elevation range of the permit area and CIA is relatively small (generally between 5,500 feet – 6,100 feet). Soils within the permit area tend to be fine grained, ranging generally from loam to silty clay loam. If irrigated, the soil supports alfalfa and similar crops. Otherwise, the soils mostly support rangeland plants such as shadscale, Indian ricegrass, greasewood, and/or saltgrass.

#### **GEOLOGY INFORMATION**

The Emery coal field is located at the western side of the San Rafael Swell. The bedrock dips to the west-north-west at angles of 3-4 degrees. The field is bounded on the west by the Joe's Valley fault zone, a regional graben structure. No other faults are known. Plates VI-2 and VI-2A depict the surface geology of the area.

Three geologic units are of particular significance in the permit area and CIA: Quarternary colluvium and alluvium, the Bluegate Shale member of the Mancos Shale and the upper portion of the Ferron Sandstone member of the Mancos Shale.

Quarternary colluvium and alluvium occurs on toe slopes, along the drainages and on the high terraces. The colluvium is a bouldery, loamy sand below sandstone outcrops and a silty clay below shale hills. The Quarternary alluvium and terrace deposits are crudely stratified, poorly sorted sands and gravels. Alluvium occurs as unconsolidated deposits of partly stratified silt, sand and gravel deposits in and adjacent to Quitchupah Creek and Christiansen Wash. South of Quitchupah, this material grades into fine silty surficial material which is probably older alluvium. It is difficult to distinguish this older material from weathered Bluegate Shale.

The Bluegate Shale outcrops west of Christiansen Wash and west of Quitchupah Creek south of the mine office. It is a saline, bluish gray, silty mudstone or siltstone. The Bluegate Shale is a unit of marine origin composed of irregularly bedded mudstone and siltstone with rare thin sandstone lenses. Thin sandstone beds occur within the Bluegate Shale. Where the Bluegate Shale is exposed at the surface it forms barren shale hills. The Ferron Sandstone overlies the Bluegate Shale, which acts as a confining bed over the Upper Ferron aquifer. Due to the shale content of this formation, permeability is considered to be very low. Water is contained in the Bluegate Shale; however, it is not considered an aquifer in the regional context. Water is generally thought to exist and move via localized fracturing in the formation. In the area where the Bluegate Shale is exposed, it is highly weathered, allowing for communication between the Christiansen Wash alluvium and the Upper Ferron Sandstone aquifer. The Bluegate Shale ranges in thickness from 0 to 70 feet in the surface mine permit area.

The Ferron Sandstone is the coal bearing unit of the Emery field. The coal beds are described in Part V.A.3 of the approved MRP. The Ferron averages about 400 feet thick and is

composed of interbedded, lenticular layers of sandstone, siltstone, shale, clay and coal. The upper contact is sharp and usually can be easily detected on electric logs. The lower contact is transitional over a thickness of about 60-70 feet. The Ferron Sandstone aquifer has an average saturated thickness of 60 feet, and the alluvium along Christiansen Wash varies from a few feet to 25 feet in thickness. Overburden depths range from 20 to 140 feet over the coal (for further description of the ground water system, see the Ground Water section of this analysis).

Unconsolidated alluvial aquifers also exist at the mine. Alluvial terrace deposits overlying the Bluegate are water bearing, as are the alluvial deposits of Christiansen Wash and Quitcupah Creek.

#### Hydraulic Conductivity

In sedimentary rocks, there is a wide range of textures or fabrics that determine the hydraulic characteristics of the unfractured medium. These textures or fabrics are related to the mineralogy or composition of the sediments, the range of sizes of the sedimentary particles (sorting), the spatial distribution of different sediment-sizes (grading), the shape and spatial orientation or arrangement of the sediment particles after compaction (packing), cementation and properties acquired or altered as the sediments were lithified.

The Permittee calculated the hydraulic conductivity of the Ferron Sandstone (geologic unit containing the I-J mineable coal seam in the Emery Coal field) in lieu of the 160 IBC proposal submitted to the Division in December 2006. The average hydraulic conductivity of the Ferron Sandstone overlying the coal seam was determined to be 0.20 ft/day. This value compares well with independently produced data from Lines et al in U.S. Geological Survey Water-Supply Paper 2195, Hydrology of the Ferron Sandstone Aquifer and Affects of Proposed Surface Mining in Castle Valley, Utah. Laboratory hydraulic conductivity data provided by Lines et al. (1983) averaged 0.11 ft/day in the horizontal flow direction and 0.076 ft/day in the vertical direction. Hydraulic conductivities derived from field tests summarized by Lines et al. (1983) averaged 0.55 ft/day.

#### **CLIMATE**

Summer precipitation generally results from convection-type storms that move into the area from the south. Those storms are generally localized and of short duration; however, they product torrential rains that often result in flash flooding and associated property damage.

Air temperatures vary considerably both diurnally and annually throughout the CIA. Midsummer daytime temperatures commonly exceed 100 degrees F and midwinter night-time temperatures can reach well below 0 degrees F. Normal annual precipitation in the area is in the range of 8-10 inches/year (USGS, Water Resources Investigations Open-File Report 83-88,1984).

The Palmer Hydrologic Drough Index (PHDI) indicates long-term climatic trends for the

**HYDROLOGIC SYSTEM AND BASELINE CONDITIONS** Lower Quitchupah

region. The PHDI is a monthly value generated by the National Climatic Data Center (NCDC) that indicates the severity of a wet or dry spell. The PHDI is computed from climatic and hydrologic parameters such as temperature, precipitation, evapotranspiration, soil water recharge, soil water loss and runoff. Because the PHDI takes into account parameters that affect the balance between moisture supply and moisture demand, it is useful for evaluating the longterm relationship between climate and groundwater recharge and discharge. The Lower Quitchupah Creek Watershed lies in Region 7 for the State of Utah. Figure 1 shows the PHDI for 1977 through 2005.

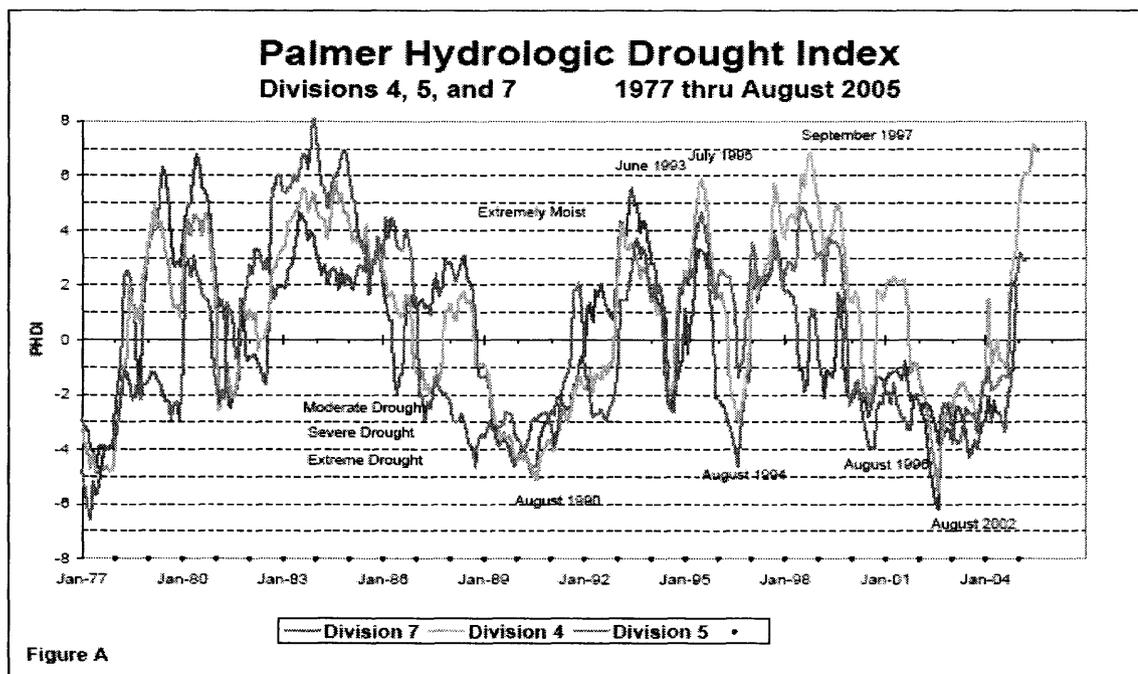


Figure 1- Palmer Hydrologic Drought Index, Divisions 4, 5 and 7

**HYDROLOGY**

As part of the Emery Deep mining and reclamation plan (MRP), the Permittee has implemented a baseline and operational surface- and ground water monitoring program for their permit and adjacent areas. The locations of the water monitoring sites are shown on Plates V1-1, Location Map Surface Water Stations and VI-3, Ground Water Monitoring Well and Surface Water Monitoring Site Location Map.

### Ground Water

Groundwater within the mine permit and CIA occurs primarily within the Ferron Sandstone. The Ferron Sandstone is situated between the overlying Bluegate Member of the Mancos Shale and the underlying Tununk Member of the Mancos Shale, both of which are relatively impermeable and considered aquicludes. The Ferron Sandstone outcrops in a series of prominent cliffs along the eastern edge of the Emery coal field and dips to the northwest beneath the ground surface. The continuity of the Ferron is broken in the subsurface by the Joe's Valley-Paradise fault zone, which exists immediately northwest of the permit area.

The largest source of recharge to the coal-bearing Ferron Sandstone member in the Emery coal field is subsurface inflow from the Wasatch Plateau to the west (Lines and Morrissey, 1981, p. 58). Much of the water is transmitted in the subsurface along

Several aquifer pump tests have been conducted by the United States Geological Survey. The tests were conducted utilizing the monitoring wells located within and outside the permit area. The drawdown and recovery data obtained from the tests were utilized to calculate storage coefficients and transmissivity values. In addition, the Permittee conducted three pump tests on several stratigraphic sections of the Ferron aquifer. The data for the USGS and Permittee pump tests are tabulated in Table VI-4 of the MRP. The data indicates an average transmissivity of 2,730 gpd/ft and a storage coefficient of  $1.59 \times 10^{-3}$ .

From static water level data obtained from the monitoring wells in the permit and adjacent areas, it's apparent from head differences that the groundwater within the CIA has the widespread potential to move downward from the upper Ferron Sandstone into the coal-bearing section of the Ferron and to a lesser degree, upward from the middle Ferron Sandstone. Although the Ferron Sandstone is completely saturated within the existing mine area, historic inflows to the mine have been predominantly from the roof rather than the floor. This suggests that the upper and lower portions of the Ferron Sandstone are hydraulically separated. This hydraulic separation is further evidenced by comparing Plates VI-4, Upper Ferron Potentiometric Surface and VI-5, Lower Ferron Potentiometric Surface, of the MRP. Plate VI-4 clearly depicts a cone of depression within the upper Ferron Sandstone aquifer as a result of mine dewatering operations, while the lower Ferron Sandstone aquifer shows very little potentiometric surface impacts in the mined area. A slight difference in water quality data provides further evidence that there is a separation between the upper and lower Ferron Sandstones. This is further substantiated by examining the head differences depicted on Table VI-5 of the MRP. The data indicates that the upper Ferron Sandstone water levels are stressed as a result of mine water inflow, while those in the lower Ferron Sandstone are not.

Groundwater discharges from the Ferron Sandstone by wells, by dewatering of the Emery Mine, by seepage into Quitchupah Creek and Christiansen Wash and by leakage into the Bluegate and Tununk Shales. Within the immediate vicinity of the permit area, the largest anthropogenic discharge of ground water from the Ferron Sandstone is dewatering of the Emery Mine, which accounts for approximately 0.6 to 1.2 cubic feet per second of water being removed

from the Ferron Sandstone (See page 8 of Chapter XIII of the MRP).

Recharge to the groundwater body in the CIA is believed to originate from the Joe's Valley-Paradise fault zone (Morrissey, Lines and Bartholoma, 1980). Relatively higher amounts of precipitation in the recharge zone and the shape and southeastward slope of the potentiometric surface suggest this to be the case.

Although the amount of ground water recharge to the Ferron Sandstone is not well understood, the upper, middle and lower sandstone units within the Ferron Sandstone are known to contribute subsurface outflow to Muddy and Quitchupah Creeks, Christiansen Wash and to Miller Canyon. Based upon USGS estimates (Morrissey, Lines and Bartholoma, 1980) recharge to the Ferron Sandstone aquifer is approximately 2.4 cfs along the Joe's Valley-Paradise fault zone in the vicinity of the Emery Mine. Bluegate Shale overlies the Ferron Sandstone throughout much of the region. The Bluegate is believed to have very poor permeability because of its fine-grained lithology. As a result, vertical percolation of precipitation and applied water in the CIA are probably not major sources of recharge to the Ferron Sandstone.

Potentiometric surface maps (Plate VI-4 and VI-5) for the upper and lower Ferron Sandstone indicate that the ground water moves generally updip and in a southeast direction toward the areas of the mine and toward areas of outcrop. Plate VI-4 clearly shows that the potentiometric surface of the upper Ferron Sandstone aquifer has been affected by mine water inflow.

After migrating to the southeast toward the mine site, groundwater in the Ferron Sandstone discharges into alluvium along the channels of Quitchupah Creek and Christiansen Wash along sandstone outcrops just east of the mine boundary. Based upon USGS estimates (Morrissey, Lines and Bartholoma, 1980), discharge to streams in the area of the Emery Mine is approximately 0.4 cfs from the entire Ferron Sandstone aquifer. Based on its relative thickness, the upper Ferron Sandstone would be about 1/5 of this value based on its relative thickness. The most significant discharges from the Ferron sandstone aquifer with respect to the potential effects of the Emery mine operation include: mine discharge, discharge to alluvium, discharge at springs and well discharge.

Groundwater of the upper Ferron sandstone aquifer seeps or flows into the mine and is discharged via pumps to sedimentation ponds. Discharge to alluvium occurs from the entire Ferron sandstone aquifer at various locations.

#### Groundwater Quality

Groundwater samples have been collected regularly from monitoring wells since 1979 at the Emery Mine. Statistical summaries and individual sample reports are found in Table VI-7 and Appendix VI-1 of the MRP. In addition, water quality data can be obtained from the the Division of Oil, Gas and Mining's Utah Coal Mining Water Quality Database-  
<http://www.ogm.utah.gov/coal/edi/wqdb.htm>. The primary chemical constituents which

characterize the quality of the upper Ferron Sandstone aquifer waters are primarily bicarbonate ( $\text{HCO}_3$ ), sulfate ( $\text{SO}_4$ ) and sodium (Na). The pH values generally range between 7.0 and 9.5. Natural groundwater quality in the upper Ferron Sandstone is moderately saline, with total dissolved solids (TDS) concentrations in monitoring well and mine roof inflow samples averaging approximately 1,000 to 1,3000 mg/l (See Table VI-9 of the approved MRP). The total dissolved solids concentration of groundwater in the lower Ferron Sandstone tends to be slightly less, averaging approximately 800 mg/l (see previously noted table). The difference in salinity further suggests a hydraulic separation between the upper and lower Ferron Sandstone. Sodium and sulfate are the dominant ions in groundwater occurring in both the upper and lower Ferron Sandstone.

A spring and seep inventory for the Emery Mine was conducted in 1979. Springs and seeps within one mile outside of the permit boundary were located and evaluated. Each of the springs were evaluated for the field parameters of temperature, pH, conductivity, dissolved oxygen and discharge (when possible). Within the study area, 14 springs were identified. Locations and field measurements for each of the sites are exhibited on Plates VI-2 and VI-2A and Table VI-10 respectively. All of the springs were observed to be issuing from pediment gravels overlying the Bluegate Shale. No springs were found to be issuing from the Bluegate Shale. Two springs are known to discharge from the Ferron Sandstone aquifer within the CIA. Spring SP-15 (See Plate 2A) is believed to discharge from the upper Ferron Sandstone aquifer and is appropriated for 0.1 cfs by Consol for stockwatering purposes. The spring is not expected to be affected by underground mining. SP-16 is believed to discharge from the lower Ferron Sandstone and is unappropriated.

Within the CIA, well discharges from the Ferron Sandstone aquifer include the Emery municipal well (approximately 90 gpm) and the Bryant and Lewis wells (approximately 30 gpm each). The Bryant and Lewis well have been impacted by underground mining in that they no longer flow at the land surface. The Permittee has furnished and installed pumps and surface ancillary facilities in order to replace these water supplies.

Plate VI-6 contains the locations of water supply intakes for current users of surface water in and around the mine plan area and also identifies receiving streams, irrigation diversions and water well users. Plate VI-3 identifies surface and ground water monitoring stations. Plate VI-4 and VI-5 show the location and extent of subsurface water within the upper and lower Ferron Sandstone members while Figures VI-5 thru VI-9 show seasonal static water level variations for the upper Ferron Sandstone aquifer.

Predicted mine-water inflow/discharge rates through the period of the mine plan (2013) are summarized in Table VI-23B from the MRP. The rates were calculated based on the Hantush equation (Freeze and Cherry., 1979). Spreadsheets detailing the calculations are provided in Appendix VI-9 of the MRP. Based on these calculations, discharge rates are expected to average 1.50 cfs with a range of 1.2 to 2.0 cfs. Variations in discharge rates are anticipated depending on the depth of mining below the potentiometric surface and the area over which mining will occur. The estimates are based on a hydraulic conductivity of 0.20 ft./day.

**HYDROLOGIC SYSTEM AND BASELINE CONDITIONS** Lower Quitchupah

The hydraulic conductivity value was calculated utilizing historic discharge rates. The estimates presented in Table VI-23B assume full extraction of the coal.

Table VI-23B: Predicted Mine Water Discharge Rates

Year	Predicted Discharge (cfs)
2006	1.29
2007	1.19
2008	1.33
2009	1.77
2010	1.28
2011	1.52
2012	1.63
2013	1.98
Average	1.50

Surface Water

The Emery Mine is situated at the confluence of Quitchupah Creek and its tributary, Christiansen Wash. Quitchupah Creek, a perennial stream whose headwaters in the eastern flank of the Wasatch Plateau, are primarily sustained by snowmelt, receives additional flow in the vicinity of the mine from several sources, including:

- Direct irrigation return flows containing mostly water whose source was Muddy Creek.
- Groundwater discharge from the Ferron Sandstone aquifer.
- Irrigation induced seepage from the Quaternary pediment deposit aquifers.
- Discharge from the Emery Mine.
- Overland flow from storm events and spring snowmelt.

Christiansen Wash owes the majority of its flow to irrigation water diverted from Muddy Creek which reaches the stream either as direct return flows or as seepage from Quaternary pediment deposit aquifers. Additionally, groundwater discharge from the Ferron Sandstone aquifer, as well as surface contributions from spring snowmelt and occasional storm events, contribute flow and influence the water quality of Christiansen Wash.

The assortment of influences affecting both Quitchupah Creek and Christiansen Wash creates considerable fluctuations in both streamflow and water quality. Systematic stream gaging in the Emery Mine area has been conducted by the USGS, Angelus Owili-Eger of Conoco and WATEC. Examination of the data indicates that increases in flow occur on Christiansen Wash where a spring fed tributary discharges into the drainage. Quitchupah Creek's flow is increased by a tributary carrying direct irrigation releases and irrigation return flows. Less consistent fluctuations in flow, including both gains and losses, were measured. These gains and losses may reflect various contributions from ground water and irrigation return

flows, as well as seepage losses to the alluvium. In addition, man induced and natural streamflow fluctuations may account for some of the apparent gains and losses.

In the spring of 1978, the USGS, Water Resources Division, installed a bubble gage type continuous recording monitoring station on Quitchupah Creek and Christiansen Wash. From these records, it is apparent that both streams experience a wide seasonal variation in flow as well as occasional flood events. As would be expected, the peak flows generally occur in May as a result of mountain snowmelt, while low flow is experienced in the fall and winter.

Considerable fluctuation in streamflow is also evident from day to day during the spring and summer months. This can be explained in the spring by fluctuations in temperature as it affects melting of the mountain snowpack. However, by mid-summer, snowmelt is no longer a factor and the hydrograph would be expected to smooth out. The fluctuations in flow during the summer and fall, therefore, can be explained only by man-induced irrigation influences as there is little precipitation during this time period.

In addition to seasonal and man-caused changes in streamflow, both Quitchupah Creek and Christiansen Wash experience flash floods caused by storm events. These flash floods carry a considerable amount of debris and can cause channel changes and damage to recording structures and equipment.

The USGS has conducted seepage studies along Quitchupah Creek and Christiansen Wash. Available data are given in Table VI-14 of the MRP. Within the CIA, the USGS seepage data indicate that a general downstream increase in flow on both Quitchupah Creek and Christiansen Wash.

From all of the streamflow data presented for Quitchupah Creek and Christiansen Wash, some basic conclusions can be made:

1. Streamflow generally increases in the downstream direction on both Christiansen Wash and Quitchupah Creek.
2. Peak runoff occurs in May as a result of snowmelt and low flows occur in fall and winter.
3. Both streams are subject to occasional flash flooding.
4. On both Quitchupah Creek and Christiansen Wash, considerable changes in flow during very short time periods have been observed and documented. These flows result from irrigation practices in the region.

Water is discharged from the mine through sedimentation ponds. Flows at these outfalls are about 370,000 and 250,000 gallons per day at sites 6 and 12 respectively.

Due to the complexity of the surface water hydrology of both Christiansen Wash and

Quitcupah Creek, it is extremely difficult to determine even the relative contributions to streamflow of the various influences such as irrigation return flows and seepage, discharge from the Ferron Sandstone, surface runoff and losses to seepage into alluvium. Only the discharges from the mine sedimentation ponds are readily measured.

#### Surface Water Quality

Within the CIA and adjacent area containing the Quitcupah Creek and Christiansen Wash watersheds, the smallest dissolved-solids concentrations in surface water are at the higher altitudes where concentrations generally are less than 500 milligrams per liter (Lines et al. 1984). Dissolved solids concentrations increase markedly as the streams emerge from the mountains and cross the Mancos Shale. Shales in the Mancos typically contain large quantities of soluble minerals, including gypsum ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ), mirabilite ( $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$ ) and thenardite ( $\text{Na}_2\text{SO}_4$ ). In the lowland areas where the Emery Mine and CIA are located, the dissolved solids concentrations in streams vary from less than 500 to more than 2,000 milligrams per liter (Lines et al., 1984). During most years, the minimum dissolved-solids concentrations occur during high flows resulting from snow-melt. The maximum concentrations generally occur during the late summer, maintained primarily by ground-water discharge. The largest seasonal changes occur in the lowland areas (i.e. Emery Mine CIA). In the lowland streams the dominant ions during high flow are calcium magnesium, and bicarbonate but during low flow, are generally are sodium, calcium and sulfate (Lines et al, 1984).

A considerable amount of site-specific water quality data has been gathered in the vicinity of the Emery Mine by the USGS, Utah Water Resources Division, ConsolChapter VI of the approved MRP discusses the surface water quality in the region. The data suggests that the concentrations of dissolved constituents generally increase in the downstream direction along Christiansen Wash. This is attributed to irrigation return flow seeping into the stream. The TDS concentration of Christiansen Wash ranges from about 1,000 to 5,000 mg/l and is typically indirectly related to discharge rate. Calcium, sodium and sulfate are the dominant ions. Total suspended solids (TSS) concentrations vary widely in Christiansen Wash (from less than 100 to more than 3,000 mg/l) and tend to be directly related to discharge rate.

The USGS performed a year long study on Quitcupah Creek between July 1975 and September 1976. The USGS collected samples at Site S-18 where Utah State Highway 10 crosses Quitcupah Creek and at site S-29 on Quitcupah Creek where it joins Ivie Creek. Site S-18 is located on the western edge of the permit area. Site S-29 is located approximately 2.5 miles south of the permit area. Between the two sampling sites, Quitcupah Creek's water increases in concentrations of nearly all constituents: pH increased from 8.1 to 8.3, TDS increased from 939 to 2,496 mg/l and SAR increased from 2.2 to 5.5. At both stations,  $\text{SO}_4$  was the dominant anion, but its relative proportion to  $\text{HCO}_3$  and Cl greatly increased downstream at site S-29. At site S-18, the specific conductivity of 1,346 umhos/cm at 25 degrees C and SAR of 2.2 classify the water as high salinity, low sodium water. This water may be used for irrigation of plants with good salt tolerance grown in well drained soils. AT site S-29, the specific conductivity of 3,078 umhos/cm at 25 degrees C and SAR of 5.5 classify the water as very high

salinity, medium sodium water. This water is not suitable for irrigation under ordinary conditions.

#### Alluvial Valley Floors

Alluvial valley floors (AVF) have been identified within the Emery Mine permit area and CIA. Volume XI of the MRP discusses the AVF investigations performed relative to the Emery Mine operation. The Upper Quitchupah Creek drainage and associated AVF could be potentially impacted by mining related activity. The other drainages within the CIA (Christiansen Wash, Muddy Creek and Ivie Creek) do not satisfy the federal criteria for AVF designation.

The Upper Quitchupah Creek drainage is defined as that portion of Quitchupah Creek above the confluence with Christiansen Wash. The upper Quitchupah Creek Valley contains unconsolidated stream-laid deposits as shown on Plate 1 of Appendix XI-1 in the MRP. The Upper Quitchupah Creek drainage contains several areas where flood irrigation activities are ongoing. An assessment of the annual runoff in the area indicates that sufficient water could be available from Quitchupah Creek to flood irrigate 300 to 400 acres along the Quitchupah Creek Valley. Presently, the agricultural activities on the north side of Quitchupah Creek are irrigated from Muddy Creek water diverted through the Emery Ditch (See Plate XI-1). The fields south of Quitchupah Creek are irrigated primarily from water diverted from Quitchupah Creek about two miles west of the permit area. The areas presently irrigated in the Upper Quitchupah Creek valley are outlined on Plate XI-1.

The areas outlined in Plate XI-1 (Areas 1-3) meet the criteria for a positive AVF determination. Area 1 is located within a grandfathered area and is therefore exempt from UMC 822.12(a) and (b). Area 2 is presently irrigated by Muddy Creek water but could potentially be irrigated with Quitchupah Creek water. Area 3 is the area presently being irrigated with Quitchupah Creek water. Areas 2 and 3 as depicted on Plate XI-1 are subject to the protection requirements of UMC 822.122(a) which requires that the mining activities will not interrupt, discontinue or preclude farming on AVF's unless the premining land use is undeveloped rangeland or the affected area is small and provides negligible support for farm production. The possible effect of mining under these areas would be subsidence of the surface. Subsidence could cause changes in the surface drainage patterns and thus interrupt farming operations. In order to prevent subsidence impacts to the farming operations, the Permittee has established a buffer zone around the aforementioned AVF's. The buffer zones are established taking into account the angle of draw and the amount of overburden in the area. See below Section IV-SUBSIDENCE discussion for further information.

**IDENTIFY HYDROLOGIC CONCERNS**

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## **IV. IDENTIFY HYDROLOGIC CONCERNS**

General hydrologic concerns include changes of flow rates and chemical composition that could physically affect the off-permit hydrologic balance. Changes to the existing hydrologic regime or balance need to be limited in order to prevent economic loss to existing agricultural and livestock enterprises, prevent significant alteration to the channel size or gradient and maintain adequate capacity for existing fish and wildlife communities. The basis for the limiting value of a parameter may differ according to site specific conditions.

The surface and ground water hydrology in the vicinity of the Emery Mine is complex due in part to the imperfect understanding of the communication of ground waters within the various stratigraphic units above and below the mine and due to the unpredictable anthropogenic caused variations in streamflow and water quality resulting from irrigation practices. Isolating the effects of mining on the surface and ground water systems is somewhat difficult but there are several influences which can be distinguished:

- Contamination from acid- or toxic-forming materials;
- Increased sediment yield from disturbed areas;
- Impacts to groundwater availability;
- Impacts to surface water availability;
- Increased total dissolved solids concentrations in surface and groundwater;
- Flooding or streamflow alteration;
- Hydrocarbon contamination from above ground storage tanks and
- Subsidence related impacts to surface and ground water.

### **CONTAMINATION FROM ACID- OR TOXIC-FORMING MATERIALS**

Information concerning acid-and toxic-forming materials in rock at the Emery Mine is presented in Sections V.A.4 through V.A.6 and Chapter XIII of the MRP. The data presented indicates that the pH of the roof and floor materials of the mine range from 5.0 to 9.1 with the acid-base potential indicating a net base potential. The alkaline nature of the system is further indicated by the fact that the pH of groundwater in the area is typically in the range of 7.0 to 9.5.

Except near outcrops, the electrical conductivity of the rock is generally low. However, naturally occurring sodium adsorption ratios and exchangeable sodium percentages of the rock are moderately high. As a result, sodium adsorption ratios calculated from the data presented in Table VI-9 suggest that groundwater discharged from the mine may have a low to medium sodium hazard if that water is used for irrigation without further treatment. Analyses of rock samples presented in Section V.A.4 indicate that concentrations of trace elements are generally low so that the rock can be considered non-toxic forming. Thus, with the exception of moderate sodium concentrations in some samples, analytical data obtained from the local rock and mine-water discharges indicate that no significant potential exists for the contamination of surface and groundwater in the permit and adjacent areas by acid- or toxic-forming materials.

### **INCREASED SEDIMENT YIELD FROM DISTURBED AREAS**

Mining and reclamation at the Emery Mine has the potential to increase sediment concentrations in the surface waters downstream from disturbed areas. Sediment-control measures such as sedimentation ponds and diversions have been installed to minimize this impact. The facilities have been designed to meet applicable regulatory requirements and are regularly inspected and maintained to ensure that they continue to meet those standards. In over 500 observations, the sediment ponds that receive disturbed area runoff at the mine-site have never recorded a discharge. Thus the potential for increased sediment yield from the disturbed areas producing an impact on the downstream receiving waters is minimal.

### **IMPACTS TO GROUNDWATER AVAILABILITY**

Of significance to the groundwater hydrologic balance is the potential for water level declines in the Ferron Sandstone aquifer resulting from mining. Groundwater has the potential to enter the Emery Mine through both the floor and roof of the mine workings from permeable, saturated sandstones above and below the IJ coal seam. Alteration of the flow pattern within the Ferron Sandstone aquifer could be caused by the creation of mineward gradients induced by inflow of water to the mine. These conditions in turn affect groundwater level declines in the mined area and in the surrounding area. Groundwater has the potential to enter the Emery Mine through both the roof and floor from the permeable, saturated sandstones. Hydrographs of water-level data collected from monitoring wells at the mine show that water level declines have been experienced in all three sections of the Ferron Aquifer and also in the Blue Gate Shale. However, the hydrographs indicate that the primary source of inflow to the mine is primarily from the upper Ferron aquifer. Significant upward leakage from the middle-Ferron is impeded by shales that constitute the floor of the mine.

Morrisey et al. (1980) indicate that recharge to the Ferron aquifer originates in the Wasatch Plateau west of the Emery Mine and discharges to the southeast along the Joes Valley Paradise fault zone. As such, this fault zone effectively acts as a linear source of groundwater recharge to the Ferron Sandstone.

Mining within the Emery Mine has locally changed the pattern of groundwater flow near the mine and part of the upper section of the Ferron Sandstone aquifer has experienced water-level declines. As mining has progressed, the mine has intercepted more and more groundwater and caused a cone of depression near the northwest corner of the mined area. Inflow of water to and discharge of water from the mine will continue to influence the shape of the potentiometric surface in the vicinity of the mine. As a result, it is anticipated that the cone of depression depicted on Plate VI-4 will change as mining continues.

Figure VI-6 of the MRP provides hydrographs of water-level data collected from monitoring wells completed within the Emery Mine permit area in the Bluegate Shale. As indicated, no declines in water levels have occurred during the recorded period of observation.

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**IDENTIFY HYDROLOGIC CONCERNS**

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In contrast, hydrographs that were prepared using data collected from wells completed in the Upper Ferron Sandstone (Figure V1-7 of the MRP) show declines in the groundwater levels during the period of record. Similar conditions are expected in the future (i.e. no substantial influence on groundwater levels in the Bluegate Shale but declining water levels in the Upper Ferron Sandstone). Gradual declines in groundwater levels may occur in the Middle Ferron Sandstone in the future, while no substantial changes in water levels would be anticipated in the Lower Ferron Sandstone.

In Chapter VI, the water rights information shows that the town of Emery maintains two wells developed in different aquifers within the Ferron Sandstone formation. These wells are used as a backup water source to the town's present water supply system which relies on surface water from Muddy Creek. Emery Town Well No. 1 is developed in the Lower Ferron aquifer, which lies well below current mining activities. Well No. 2 is developed in the Middle and Upper Ferron aquifers which are directly below and above the coal seam to be mined. No adverse impacts to either well are anticipated since the wells are located approximately 3 to 4 miles from the mine and are up gradient within the regional ground water flow pattern. Static water level readings taken from wells maintained as part of the mine's ground water monitoring program also indicate that no disruption of the aquifers in the vicinity of the town's wells has occurred.

### **IMPACTS TO SURFACE WATER AVAILABILITY**

Surface water is not used in the operation of the Emery Mine. As such, there are no depletions of overland flows or surface drainage from the mine's surface facilities. Water removed from the mine will be discharged to Quitchupah Creek, increasing the flow of this receiving stream. Historical flow data obtained by the USGS from a gaging station on Quitchupah Creek near the mine office produced an average annual flow record of 8.43 cfs. Predicted discharge levels through the year 2013 (as indicated in Table VI-23B of the MRP) are expected to average 1.50 cfs. This discharge represents an 18% increase in the above noted average annual flow of Quitchupah Creek.

Sediment ponds located on the mine site that accept runoff from the disturbed area have never recorded a discharge. Hence, a small quantity of runoff is precluded from reaching Quitchupah Creek that would discharge to this stream if the mine surface facilities were not present. Given the small amount of precipitation in the area and the relatively small area of the surface facilities, this reduction in the streamflow of Quitchupah Creek is likely minimal. Thus, the net effect of mining on the availability of surface water in the immediate area is an increase in the flow of Quitchupah Creek and downstream waters.

The discharge of mine water to Quitchupah Creek probably results in a local increase in flow and not a basin-wide increase. As discussed above, the coal being mined occurs in the Ferron Sandstone member of the Mancos Shale, which is underlain by the Tununk Shale member of the same formation. The shales of this formation have a low permeability, thus forcing groundwater to the surface as streamflow. As a result, although the discharge of water

from the mine results in a local loss of groundwater and gain in surface water, this discharge does not disrupt the hydrologic balance of the basin. The applicant has presented supportive calculations to show that flow depletions to Quitchupah Creek and Christiansen Wash, as a result of intercepted ground water, should not be significant to the drainages. The amount of intercepted flow (0.2 cfs or less) is about three percent of the mean discharge of the Quitchupah Creek-Christiansen Wash drainage system above Ivie Creek. Additionally, the water will be routed through the mine and discharged back to the Quitchupah Creek watershed, albeit at lesser quality. From a quantity perspective, however, the disturbance is not significant.

Given this condition, the actual loss of groundwater from the hydrologic balance is that water which is contained in the coal and leaves the basin upon mining or is discharged from the mine in the ventilation air.

#### **INCREASED TOTAL DISSOLVED SOLIDS CONCENTRATIONS IN SURFACE AND GROUNDWATER**

Data summarized in Table VI-9 of this MRP indicate that the average TDS concentration of water entering the mine (as measured in roof samples) is 1025 mg/l. Assuming that the equivalent-weight bicarbonate concentration can be calculated by balancing the anions and cations in that table, the roof inflow is a sodium-bicarbonate water with an average sulfate concentration of 264 mg/l. The average TDS concentration of water discharging from the mine to Quitchupah Creek (as measured at Ponds 1 and 6 and reported in Table VI-9) is 2,390 mg/l. This is a sodium-sulfate water with an average sulfate concentration of 1,340 mg/l.

The data indicates that the TDS concentration of water flowing through the mine increases by a factor of approximately 2.3. The sulfate concentration of this water increases by a factor of approximately 5.1. The ratio of calcium to sodium increases as the water flows through the mine. The increase in TDS and sulfate concentrations is probably the result of dissolution of rock dust used in the mine.

The impact of the TDS and sulfate concentration increases on surface-water resources in the permit and adjacent areas is considered minimal for two reasons. First, surface water in the permit and adjacent areas has been classified in the Utah Division of Water Quality Standards of Quality for Waters of the State (R317-2) as Class 2B (protected for secondary contact recreation such as boating, wading or similar uses), Class 3C (protected for non-game fish and other aquatic life, including the necessary aquatic organisms in their food chain) and Class 4 water (protected for agricultural uses including irrigation of crops and stock watering). NO sulfate discharge standard exists for any of these three classifications. The TDS standard for Quitchupah Creek is 2,6000 mg/l, which is greater than the average concentration previously discussed. The Permittee operates under a UPDEs discharge permit issued by the Utah Division of Water Quality and controls discharges from the mine to be consistent with that permit.

Second, except where overlain by a thin veneer of alluvial deposits, surface water in Quitchupah Creek flows across the Tununk Member of the Mancos Shale immediately

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**IDENTIFY HYDROLOGIC CONCERNS**

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downstream from the mine permit area. Since this member is gypsiferous formation, sulfate and TDS concentrations increase naturally in surface water that flows across areas underlain by this unit. Thus, the additional input of these constituents from the mine waters to local streams is considered minimal.

A TMDL study of the Muddy Creek Watershed (MFG, Inc., 2004), of which Quitchupah Creek is a tributary, indicated that Muddy Creek and its major tributaries would not support an agricultural beneficial use classification. This lack of beneficial use support occurs at the location where these streams cross State Highway 10 (i.e. upstream from mine water discharge point). The study concluded that elevated TDS concentrations in areas downstream from Highway 10 are caused predominantly by changes in surficial geology (i.e. outcropping of the saline Mancos Shale) and irrigated agriculture.

According to the U.S. Bureau of Reclamation (U.S. Bureau of Reclamation, 2003), the salt load from the Muddy Creek watershed averages 86,000 tons/yr. The Emery Mine UPDES permit currently allows a maximum salt load of 12 tons/day to be discharged from the mine. Assuming that this load is discharged constantly throughout the year, the annual salt load from the mine to the Muddy Creek watershed would be 4,380 tons/yr (about 5% of the basin-wide salt load). The UPDES permit indicates that the salt-load limit will change to 3,839 tons/yr (rather than 12 tons/day) following EPA approval of the TMDL loading limit. Once this new limit is adopted, the salt load from the Emery mine will represent about 4.5% of the annual salt load of the Muddy Creek watershed.

Section VI.A.4 of the MRP indicates that no surface water rights exist on Quitchupah Creek downstream from the mine-water discharge point, nor do they exist on Ivie Creek between the confluence of Quitchupah Creek and Muddy Creek. Hence, no substantial water-quality impact to downstream water users is anticipated.

In the post-mining situation, there is a potential for water-quality degradation within the Upper Ferron as groundwater flows through previously mined areas and then into adjacent unmined rock. However, it is expected that this condition will be tempered by the dilution effect of better quality recharge water entering the area from the west. As far as the middle and lower Ferron are concerned, a fairly uniform shale floor impedes downward seepage of mine water to lower zones. Thus, groundwater quality in these lower sections of the Ferron should not be substantially affected either during or after mining.

## **FLOODING OR STREAMFLOW ALTERATION**

Runoff from all disturbed areas flows through sedimentation ponds or other sediment control devices prior to discharge to adjacent undisturbed drainages. Three factors indicate that these sediment-control devices minimize or preclude flooding impacts to downstream areas as a result of mining operations:

The sediment control facilities have been designed and constructed to be geotechnically

## **IDENTIFY HYDROLOGIC CONCERNS**

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stable. Thus, no substantial potential exists for breaches of the sediment-control devices to occur that could cause downstream flooding. These sediment control devices are sized sufficiently that no discharges have been recorded. This precludes flooding impacts to downstream areas. By retaining sediment on site in the sediment control devices, the bottom elevations of stream channels downstream from the disturbed areas are not artificially raised. Thus, the hydraulic capacity of the streams channels is not altered and flooding potential is further precluded.

Following reclamation stream channels will be returned to a stable state. Interim sediment control measures and maintenance of the reclaimed areas during the post-mining period will serve to minimize the deposition of significant amounts of sediment in downstream channels following reclamation, thus maintaining the hydraulic capacity of the channels and further precluding adverse flooding impacts.

### **POTENTIAL HYDROCARBON CONTAMINATION**

Diesel fuels, oils, greases and other hydrocarbon products are stored and used at the mine site for a variety of purposes. Diesel and oil stored in above ground tanks at the mine facilities may spill onto the ground during filling of the storage tank, leakage of the tank or filling of the vehicle tank.

The probable future extent of the contamination caused by diesel and oil spillage is expected to be minimal and it's impact contained within the permit area. The tanks are located above ground, leakage from the tanks can be readily detected and repaired. Spillage during filling of the storage or vehicle tanks is minimized to avoid loss of an economically valuable product. In addition, the mine has a Spill Prevention Control and Countermeasure Plan that provides inspection, training and operation measures to minimize the extent of contamination resulting from the use of hydrocarbons at the site.

### **SUBSIDENCE**

Subsidence impacts are largely related to extension and expansion of existing fracture systems and upward propagation of new fractures. In as much 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 groundwater flow.

Mining at the Emery Deep Mine has been done by room and pillar methods with partial pillar extraction. With the addition of the 4<sup>th</sup>-west full extraction and 160 acre incidental boundary change addition, full extraction techniques were implemented in order to meet the Maximum Economic Recovery requirements established by the Federal Mineral Leasing Act enforced by the Bureau of Land Management.

Maximum subsidence at the Emery Mine will be approximately 50% of the extraction height. Given the current mining horizon, this would relate to 3 feet of subsidence in areas of 6 foot extraction to 5 feet of subsidence in areas of 10 foot extraction. The predicted angle of

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**IDENTIFY HYDROLOGIC CONCERNS**

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draw will range from approximately 5 degrees at 150 feet of cover, 12 degrees at 350 feet of cover and 15 degrees at 750 feet of cover or greater. Plate V-5 of the MRP (Subsidence Monitoring Points and Buffer Zones) depicts the estimated subsidence isopachs.

*Quitchupah Creek, Christiansen Wash and Alluvial Valley Floor Areas*

In order to prevent subsidence related impacts from affecting Quitchupah Creek, Christiansen Wash and the alluvial valley floor areas on the west side of the permit area (See Plate V-5 of the MRP), the Permittee has established designated buffer zones in these areas based on the angle of draw. Plate V-5 depicts the buffer zone areas associated with the aforementioned hydrologic features. The buffer zones are created by leaving coal pillars of adequate size beneath these areas. The dimensions of the buffer zone were determined by the overburden depth and the angle of draw. With respect to Quitchupah Creek and Christiansen Wash, the buffer zone will include an additional standoff distance of 100 feet on either side of the drainage as required by UMC 817.57. The pillar dimensions are based on established geotechnical information and a factor of safety for long term pillar stability. The partial pillar splitting design data is provided in Chapter V Pages 28A, 28B and 28C.

Subsidence will occur in areas occupied by ephemeral stream channels. Although surface cracks that result from subsidence in the permit area are expected to heal with time in areas overlain by unconsolidated deposits and the Bluegate Member of the Mancos Shale, ephemeral stream flows may be partially intercepted prior to completion of the healing process. In addition, the broad depressions created by subsidence may locally retain runoff that would normally discharge from an area. However, the following factors indicate that the impact of subsidence on ephemeral streamflow will be minimal:

Ephemeral streamflow in the area is sporadic, allowing significant periods of time for surface cracks to heal between flow events. Ephemeral streamflow typically carries a high sediment load. This sediment will fill remaining cracks. As the cracks heal, the potential for interception of streamflow is minimized. The depressions created by subsidence are sufficiently broad that changes in slope are not typically of an ample magnitude to cause ponding in anything other than local areas.

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**IDENTIFY HYDROLOGIC CONCERNS**

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## V. IDENTIFY RELEVANT STANDARDS

### RELEVANT STANDARDS

The CHIA is based on the best currently available data and is a prediction of mining related impacts to the hydrologic balance outside of the specific permitted coal mine areas. To verify that conditions remain within acceptable limits, the mine operator is required to monitor water quality and quantity as part of the permit requirements. The plans for monitoring are set forth in the Mining and Reclamation Plans (MRP) for the Emery Deep Mine and have been determined adequate by the Division to meet regulatory requirements. If monitoring results show significant departures from the values established in the MRP and in this CHIA, or exceed UPDES discharge requirements, immediate remedial actions are provided for by SMCRA.

Water quality standards for surface waters in the State of Utah are found in R317-2, Utah Administrative Code (UAC). The standards are intended to protect the waters against controllable pollution. Waters, and the applicable standards, are grouped into classes based on beneficial use designations. The Utah Division of Water Quality of the Department of Environmental Quality has classified surface waters in the CIA as:

2B-Protected for secondary contact recreation such as boating, wading or similar uses.

3C-Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.

4-Protected for agricultural uses including irrigation of crops and stock watering.

*Flow:* There is no standard for flow in the Emery Deep permit nor in Utah water quality standards. At the Emery Deep Mine, UPDES discharge is to be recorded twice monthly. Characteristics such as stream morphology, vertebrate and invertebrate populations, and water chemistry can be affected by changes in flow and therefore can provide an indirect standard for flow.

*Oil and Grease:* There is no State water quality standard for oil and grease, but the UPDES permit limit for the Emery Deep Mine is a daily maximum of 10 mg/L; only one sample a month, either grab or composite, is required to measure this, but weekly visual monitoring is required.

*Total Dissolved Solids (TDS):* The concentration of dissolved solids is commonly used to indicate general water quality with respect to inorganic constituents. There is no state water quality standard for TDS for Classes 1, 2, and 3, but 1,200 mg/l is the limit for agricultural use (Class 4). The total amount of dissolved solids discharged from the Emery Mine operation is limited to 12 tons/day from all discharge points determined by two grab samples a month.

## IDENTIFY RELEVANT STANDARDS

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*pH:* Allowable pH ranges are 6.5 to 9.0 under the Emery Mine UPDES permit. The range is based on Utah secondary treatment requirements.

*Total Suspended Solids (TSS) and Settleable Solids:* There is no State water quality standard for suspended solids in the water, but an increase in turbidity is limited to 10 NTU for Class 2A, 2B, 3A, and 3B waters and to 15 NTU for Class 3C and 3D waters. The Emery Mine UPDES permit allows a daily maximum of 70 mg/L TSS, but limits the monthly average to 25 mg/L and the weekly average to (35 mg/L). Two grab samples a month are used to determine TSS. Under the Emery Mine UPDES permit, all samples collected during storm water discharge events are to be analyzed for settleable solids. Samples collected from increased discharge, overflow, or bypass that is the result of precipitation that does not exceed the 10-year, 24-hour precipitation event can comply with a settleable solids standard of 0.5 mL/L daily maximum rather than the TSS standard, although TSS is still to be determined. If the increased discharge, overflow, or bypass is the result of precipitation that exceeds the 10-year, 24-hour precipitation event, then neither the TSS nor settleable solids standard applies.

*Iron and Manganese:* The Emery Mine UPDES permit allows a daily maximum of 1.5 mg/L total iron, which is based on an assumption that total and dissolved iron concentrations are the same. Grab samples are taken twice a month from the UPDES sites to determine iron concentration. State water quality standards allow a maximum of 1,000  $\mu$ g/L dissolved iron in Class 3A, 3B, 3C, and 3D waters, with no standard for Class 1, 2, and 4 waters.

Monitoring of total manganese is required by SMCRA and the Utah Coal Mining rules, but there is no UPDES or water quality standard for either total or dissolved manganese.

*Macroinvertebrates:* Macroinvertebrates are excellent indicators of stream quality and can be used to evaluate suitability of a stream to support fish and other aquatic life. Baseline studies of invertebrates provide standards against which actual conditions in Box Canyon and Muddy Creeks can be evaluated if desired. Price and Plantz (1987) summarized invertebrate data. There are no current plans to monitor invertebrate populations in the streams of the CIA.

Utah water quality standards exist for numerous parameters other than those already mentioned above, but at this time there is no evidence or reason indicating they are of concern or have a reasonable potential to affect the hydrologic balance of the CIA. However, those parameters that may have a reasonable possibility of affecting the hydrologic systems are included in routine water quality monitoring of the mine operations. Review of monitoring results by the mine operators and the Division will identify concerns or problems and generate revisions of the mine operations to mitigate those problems.

Sediment is a common constituent of ephemeral stream flow in the western United States.

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**IDENTIFY RELEVANT STANDARDS**

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The quantity of sediment in the flows affects stream-channel stability and most uses of the water. Excessive sediment deposition is detrimental to existing aquatic and wildlife communities. Large concentrations of sediment in streamflow may preclude use of the water for irrigating crops because fine sediment tends to reduce infiltration rates in the irrigated fields, and the sediment reduces capacities of storage facilities and damages pumping equipment. Mean sediment load is the indicator parameter for evaluating the sediment hazard to stream-channel stability and irrigation.

The concentration of dissolved solids is commonly used to indicate general water quality with respect to inorganic constituents. The quality of water from underground sources reflects the chemical composition of the rocks it passes through. That quality may be degraded by intrusion of poorer quality water from wells or mines, by leakage from adjoining formations, or by recharge through disturbed materials. Ground water discharging from seeps and springs is used by wildlife and livestock. The state standard for TDS for irrigation of crops and stock watering (Class 4) is 1,200 mg/L. The Utah Department of Environmental Quality, Division of Water Quality can authorize a coal mine to discharge into surface waters under the Utah Pollutant Discharge Elimination System (UPDES).

The Emery Mine UPDES permit contains site-specific limitations on TDS, total suspended solids, total settleable solids (for discharges resulting from precipitation events), total iron, oil and grease, and pH. There is no limit on flow but it is to be measured monthly. Additionally, there can be no more than a trace amount of visible sheen, floating solids, or foam and no discharge of sanitary waste or coal process water.

Macroinvertebrates are excellent indicators of stream quality and can be used to evaluate suitability of a stream to support fish and other aquatic life.

## **MATERIAL DAMAGE**

Material damage to the hydrologic balance would possibly manifest itself as an economic loss to the current and potential water users, would result in quantified reduction of the capability of an area to support fish and wildlife communities, or would cause other adverse change to the hydrologic balance outside the permit area. The basis for determining material damage may be found to differ from site-to-site within the CIA according to specific site conditions. Surface-water and ground-water concerns have been identified for CHIA evaluation

### *Parameters for surface-water quantity and quality*

The potential material-damage concerns this CHIA focuses on are changes of surface flow rates and chemical composition that would physically affect the off-permit stream channel systems as they presently function and affect aquatic and wildlife communities and agricultural and livestock production. Therefore, criteria are intended to identify changes in the present discharge regime that might be indicators of economic loss to existing agricultural and livestock enterprises; of significant alteration to the channel size, or gradient; and of a loss of capacity to support existing fish and wildlife communities. In order to assess the potential for material-

damage to these elements of the hydrologic system, the following indicator parameters were selected for evaluation at each evaluation site: low-flow discharge rate, TDS, and sediment load.

#### Low-Flow Discharge Rate

Measurements provided by mine operators are generally of instantaneous flow and provide some indication of long-term trends. In the Wasatch Plateau Waddell and others (1981) found that correlating three years of low-flow records (September) at stream sites against corresponding records from long-term monitoring sites would allow the development of a relationship that could be used to estimate future low-flow volumes at the stream sites within a standard deviation of approximately 20 %. Ten years of record reduced the standard deviation to 16 % to 17 %, and 15 years of data to about 15 %.

Monitoring of low-flow discharge rates will also provide a means to evaluate effects of mine discharge on the receiving streams. The Emery Mine discharge will be monitored at UPDES discharge points at the sediment pond. The potential for material damage by mine discharge water is tied to the effect on the flow in the receiving streams.

#### Total Dissolved Solids (TDS)

The concentration of dissolved solids is commonly used to indicate general water quality with respect to inorganic constituents. Ground water discharging from seeps and springs is used by wildlife and livestock. Because wildlife and livestock use is the designated post-mining land use, established dissolved solids tolerance levels for wildlife and livestock have been adopted as the thresholds beyond which material damage may occur. The state standard for TDS for irrigation of crops and stock watering (Class 4) is 1,200 mg/L. If TDS concentrations persistently exceed 1,200 mg/L it will be an indication that evaluation for material damage might be needed.

#### Sediment Load

Sediment is a common constituent of ephemeral stream flow in the western United States. The quantity of sediment in the flows affects stream-channel stability and most uses of the water. Excessive sediment deposition is detrimental to existing aquatic and wildlife communities. Large concentrations of sediment in streamflow may preclude use of the water for irrigating crops because fine sediment tends to reduce infiltration rates in the irrigated fields, and the sediment reduces capacities of storage facilities and damages pumping equipment. Sediment load measurement error is, at a minimum, the same as the flow measurement error because sediment load is directly dependent on flow and in practice cannot be measured more accurately than the flow.

TSS is the indicator parameter initially chosen for evaluating the sediment hazard to stream-channel stability and irrigation. Threshold values have initially been set as the greater of 1

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**IDENTIFY RELEVANT STANDARDS**

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standard error above the baseline mean TSS value or 120 % of the baseline mean TSS value (by analogy with the low-flow discharge rate measurement accuracy and assuming that the error in TSS will contribute equally to the error in flow when determining mean sediment load). If TSS concentrations persistently exceed these threshold values it will be an indication that evaluation for material damage from sediment load in the streams might be needed.

*Parameters for ground-water quantity and quality*

The potential material-damage concerning this CHIA are intended to limit changes in the quantity and chemical composition of water from ground-water sources to magnitudes that: will not cause economic loss to existing or potential agricultural and livestock enterprises and maintain the hydrologic balance.

Seasonal flow from springs

Maintain potentiometric heads that sustain average spring discharge rates, on a seasonal basis, equal or greater than 80 % of the mean seasonal baseline discharge, in other words baseline minus 20 % probable measurement error. The 20 % measurement error is based on analogy with the accuracy of measuring low-flow surface discharge rates. A 20 % decrease in flows, determined on a seasonal basis, will indicate that decreased flows are probably persisting and that an evaluation for material damage is needed.

TDS concentration

The concentration of total dissolved solids is commonly used to indicate general water quality with respect to inorganic constituents. The quality of water from underground sources reflects the chemical composition of the rocks it passes through. Ground-water quality may be degraded by intrusion of poorer quality water from wells or mines, by leakage from adjoining formations, or by recharge through disturbed materials. Ground water discharging from seeps and springs is used by wildlife and livestock, and those are the designated post-mining land uses. There is no water quality standard for TDS for aquatic wildlife. The state standard for TDS for irrigation of crops and stock watering (Class 4) is 1,200 mg/L. If TDS concentrations persistently exceed 1,200 mg/L it will be an indication that evaluation for material damage might be needed.

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**IDENTIFY RELEVANT STANDARDS**

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## VI. ESTIMATE PROBABLE FUTURE IMPACTS OF MINING ACTIVITY

### GROUNDWATER

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

#### *Dewatering*

Underground mining removes the support to overlying rock causing caving and fracturing of the overburden. In most mining areas it is unlikely that fractures will reach shallower perched aquifers because of the thickness of the overburden, but in areas where fracturing is extensive, subsidence induced caving and fracturing can create conduits that allow ground water to flow into the mine. Dewatering caused by fracturing may decrease aquifer storage and ground water flow to streams and springs. Water quality downstream from the mines will be impacted as well.

Predicted mine-water inflow/discharge rates through the period of the mine plan (2013) are summarized in Table VI-23B from the MRP. The rates were calculated based on the Hantush equation (Freeze and Cherry., 1979). Spreadsheets detailing the calculations are provided in Appendix VI-9 of the MRP. Based on these calculations, discharge rates are expected to average 1.50 cfs with a range of 1.2 to 2.0 cfs. Variations in discharge rates are anticipated depending on the depth of mining below the potentiometric surface and the area over which mining will occur. The estimates are based on a hydraulic conductivity of 0.20 ft./day. The hydraulic conductivity value was calculated utilizing historic discharge rates. The estimates presented in Table VI-23B of the MRP assume full extraction of the coal.

Table VI-23B: Predicted Mine Water Discharge Rates

Year	Predicted Discharge (cfs)
2006	1.29
2007	1.19
2008	1.33
2009	1.77
2010	1.28
2011	1.52
2012	1.63
2013	1.98
Average	1.50

## **SUBSIDENCE**

Subsidence impacts are largely related to extension and expansion of existing fracture systems 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 decreased flow through existing fractures that close, increased flow rates along existing fractures that open further, and the diverting of ground-water flow along new fractures or within newly accessible permeable lithologies. Subsurface flow diversion may cause the depletion of water in local aquifers and loss of flow to springs that are undermined. Increased flow rates along fractures could potentially improve water quality by reducing ground-water residence time.

Subsidence surveys have been conducted at the Emery Mine. Mine representatives inspect monthly the areas identified on Plate V-5 as full extraction areas. The reports are forwarded to the Division upon their completion. Pre-subsidence surveys are conducted 6 months prior in areas where full extraction mining will take place. The relatively moderate thickness of the overburden and the fracture system are major contributors to the amount of subsidence.

## **SURFACE WATER**

Changes in flow volume and in water quality have the greatest potential for impacting surface water resources in the CIA. The monitoring plan should help identify variations in flow caused by mining. Monitoring is a benefit to both the public and the Permittee because it can identify and separate natural and anthropogenic variations to the environment or ecosystem. A good monitoring plan can provide the necessary data to establish the necessary mitigation or show the variations are following a natural sequence.

### *Water Quality*

The quality of the local surface waters can be affected by two basic processes. First, the runoff from the disturbed lands and waste piles could increase sediment concentrations and alter the distribution and concentration of dissolved solids in the receiving streams. This potential has been shown to be minimized. The second potential cause of surface-water quality changes is related to the location and chemistry of ground-water discharges, both from the mines and from springs and baseflow.

### *Water Quantity*

Water not used in the Emery Mine or lost to evaporation is discharged to Quitcupah Creek as governed by the mines UPDES permit established with the Department of Water Quality. Ongoing monitoring will indicate total groundwater discharge due to mining.

**ESTIMATE PROBABLE FUTURE IMPACTS**

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**ALLUVIAL VALLEY FLOORS**

Alluvial valley floors (AVF) have been identified within the Emery Mine permit area and CIA. Volume XI of the MRP discusses the AVF investigations performed relative to the Emery Mine operation. The Upper Quitchupah Creek drainage and associated AVF could be potentially impacted by mining related activity. The other drainages within the CIA (Christiansen Wash, Muddy Creek and Ivie Creek) do not satisfy the federal criteria for AVF designation.

The Upper Quitchupah Creek drainage is defined as that portion of Quitchupah Creek above the confluence with Christiansen Wash. The upper Quitchupah Creek Valley contains unconsolidated stream-laid deposits as shown on Plate 1 of Appendix XI-1 in the MRP. The Upper Quitchupah Creek drainage contains several areas where flood irrigation activities are ongoing. An assessment of the annual runoff in the area indicates that sufficient water could be available from Quitchupah Creek to flood irrigate 300 to 400 acres along the Quitchupah Creek Valley. Presently, the agricultural activities on the north side of Quitchupah Creek are irrigated from Muddy Creek water diverted through the Emery Ditch (See Plate XI-1). The fields south of Quitchupah Creek are irrigated primarily from water diverted from Quitchupah Creek about two miles west of the permit area. The areas presently irrigated in the Upper Quitchupah Creek valley are outlined on Plate XI-1.

The areas outlined in Plate XI-1 (Areas 1-3) meet the criteria for a positive AVF determination. Area 1 is located within a grandfathered area and is therefore exempt from UMC 822.12(a) and (b). Area 2 is presently irrigated by Muddy Creek water but could potentially be irrigated with Quitchupah Creek water. Area 3 is the area presently being irrigated with Quitchupah Creek water. Areas 2 and 3 as depicted on Plate XI-1 are subject to the protection requirements of UMC 822.122(a) which requires that the mining activities will not interrupt, discontinue or preclude farming on AVF's unless the premining land use is undeveloped rangeland or the affected area is small and provides negligible support for farm production. The possible effect of mining under these areas would be subsidence of the surface. Subsidence could cause changes in the surface drainage patterns and thus interrupt farming operations. In order to prevent subsidence impacts to the farming operations, the Permittee has established a buffer zone around the aforementioned AVF's. The buffer zones are established taking into account the angle of draw and the amount of overburden in the area.

**ESTIMATE PROBABLE FUTURE IMPACTS**

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## **VII. ASSESS PROBABLE MATERIAL DAMAGE**

The probable hydrologic impacts are summarized below under the headings entitled Next Five Year Permit Term and Future Mining.

### **NEXT FIVE YEAR PERMIT TERM-EMERY MINE**

Planned operational monitoring will document any measurable changes in the surface and groundwater systems. Surface disturbances and UPDES permitted discharges are not expected to degrade surface or groundwater quality. Due to the buffer zones established by the Permittee (based on a calculated angle of draw and overburden amount) impacts to the identified AVF's and perennial streams are not anticipated.

Dewatering of the Upper Ferron Aquifer will continue. Future monitoring will provide data applicable to documenting change in the groundwater system.

Surface disturbance and the discharge of Emery Mine water have not significantly degraded water quality in the Quitchupah Creek drainage. Sediment control measures such as those intended for use at the Emery Deep Mine have served to reduce contaminants and stabilize water quality at acceptable discharge levels.

A monitoring and mitigation plan for full extraction mining has been implemented. The Emery Mine has been diligent at following their monitoring plan to date and have applied reasonable and effective mitigation efforts when needed. No material damage within or outside of the permit area is believed to have occurred. Monitoring of the streams, springs and vegetation for significant loss of natural habitat is ongoing.

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**ASSESS PROBABLE MATERIAL DAMAGE**

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**STATEMENT OF FINDINGS**

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## **VIII. STATEMENT OF FINDINGS**

Based on the information presented in this CHIA, the Utah Division of Oil, Gas and Mining finds that the proposed coal mining and reclamation operations of the Emery Mine have been designed to prevent material damage to the hydrologic balance outside the permit areas. The possibility of material damage within the CIA exists from the undermining of stockwatering ponds, irrigation ditches and dewatering of the Ferron aquifer. Based on ongoing monitoring and mitigation, no evidence of material damage from actual mining operations in the CIA has been found thus far. No other probability of material damage has been identified from existing and anticipated mining operations in the CIA.

The Permittee has been cooperative in conducting environmental evaluations and operations to lessen impacts to the hydrologic environments.

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**STATEMENT OF FINDINGS**

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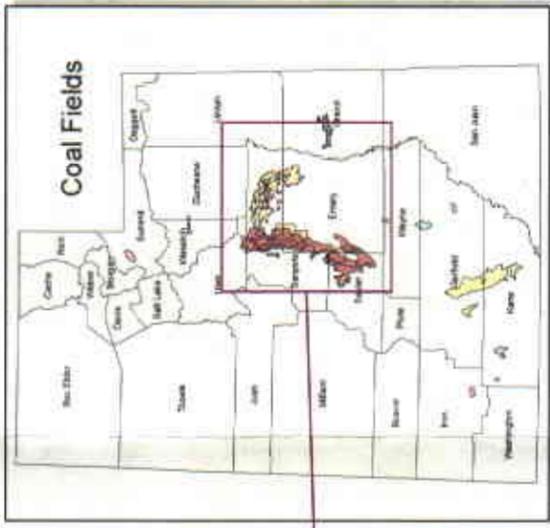
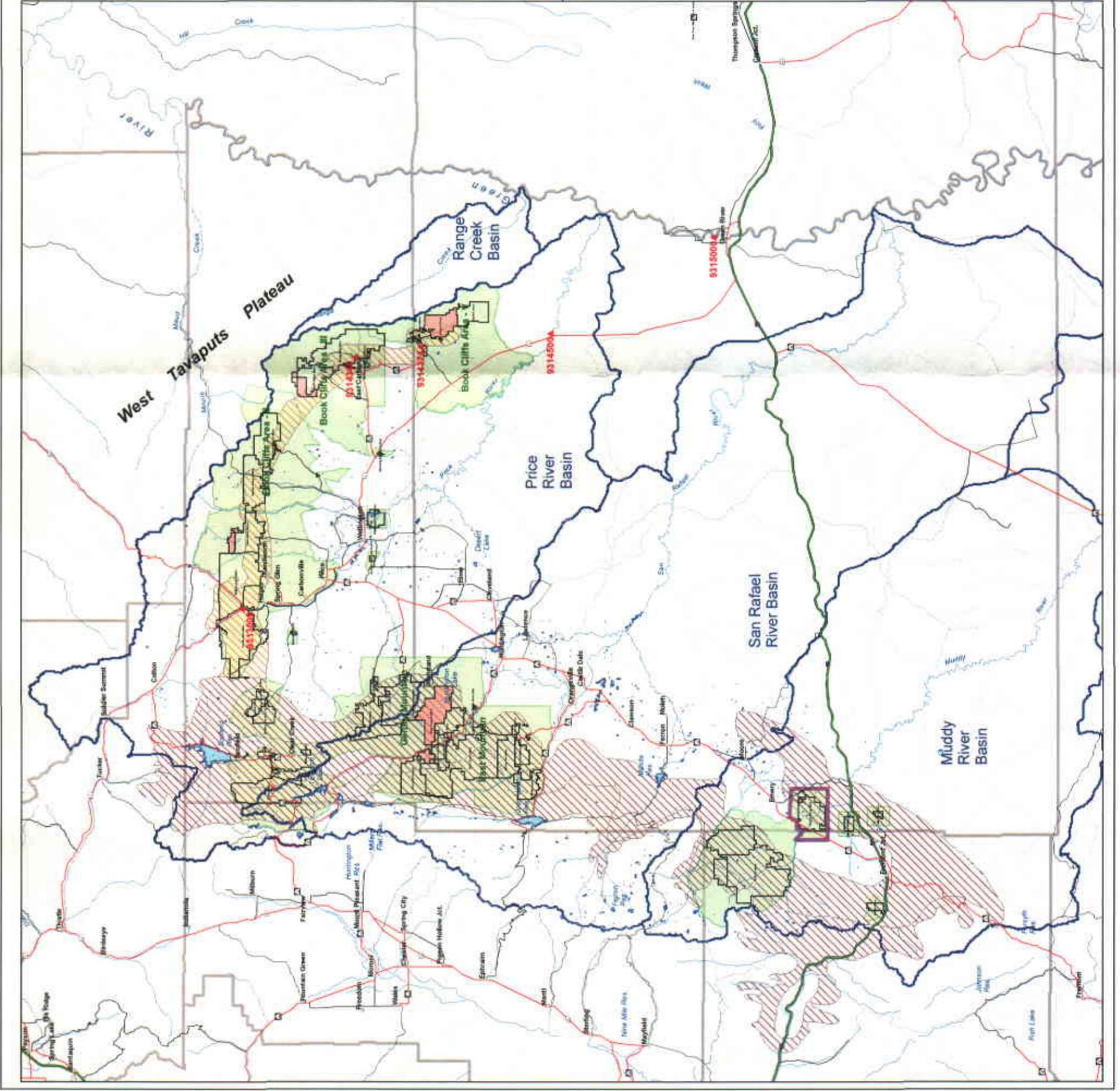
**PLATES**

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**PLATES**

<b>Plate 1</b>	<b>Location Map</b>
<b>Plate 2</b>	<b>Workings Map</b>
<b>Plate 3</b>	<b>Geology Map</b>
<b>Plate 4</b>	<b>Hydrologic Map</b>

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# Cumulative Impact Area Lower Quitchupah Creek

## Plate 1

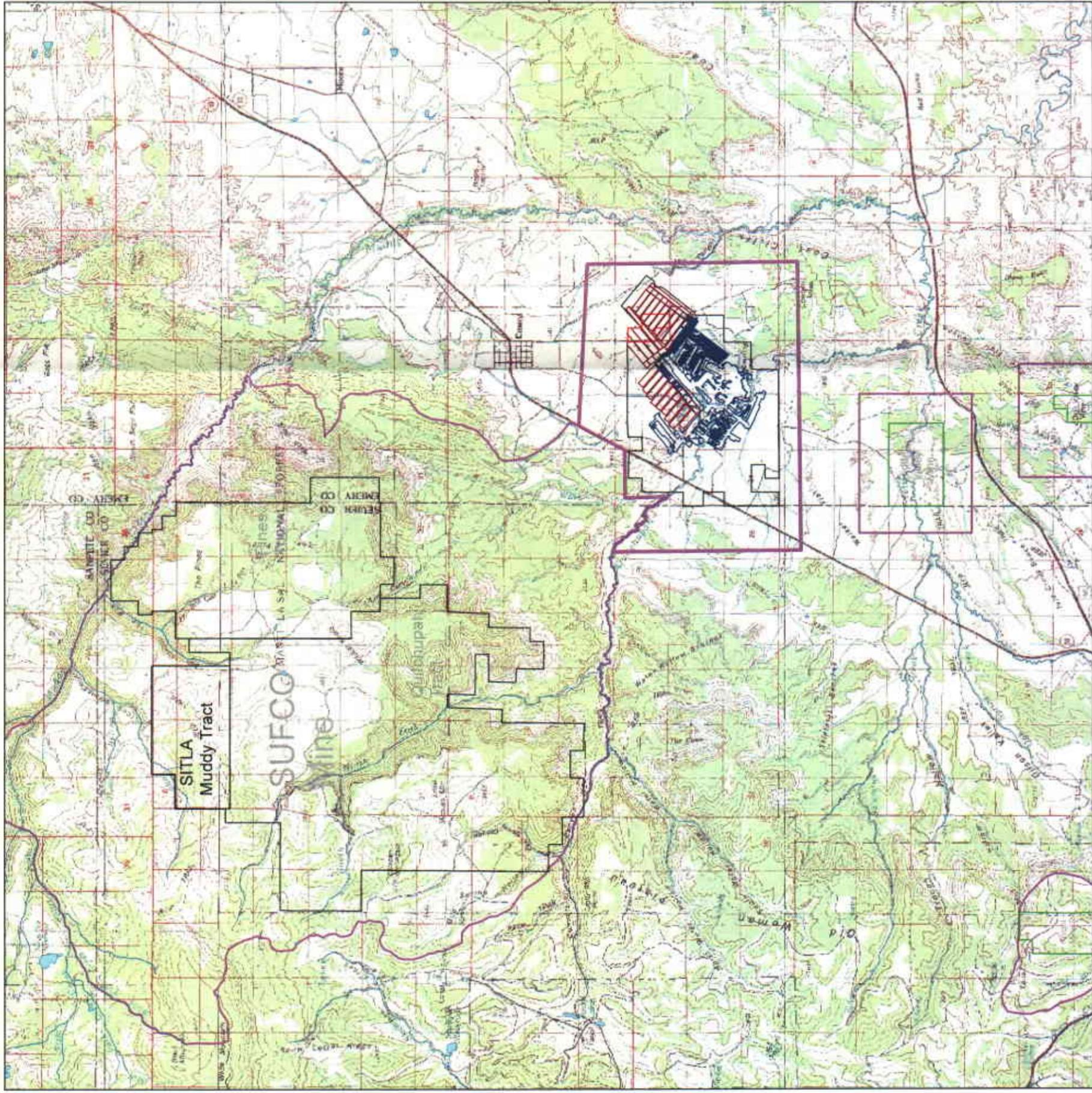
Location Map

Mar. 2007

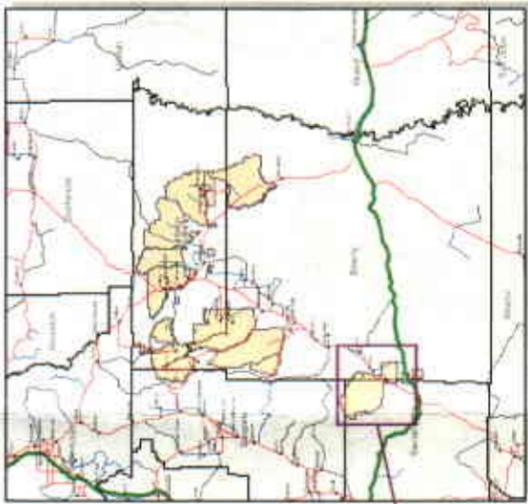
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- Impact Area
- Roads
- Coal Fields
- Other





CIA Areas



# Cumulative Impact Area Lower Quitichupah Creek Watershed

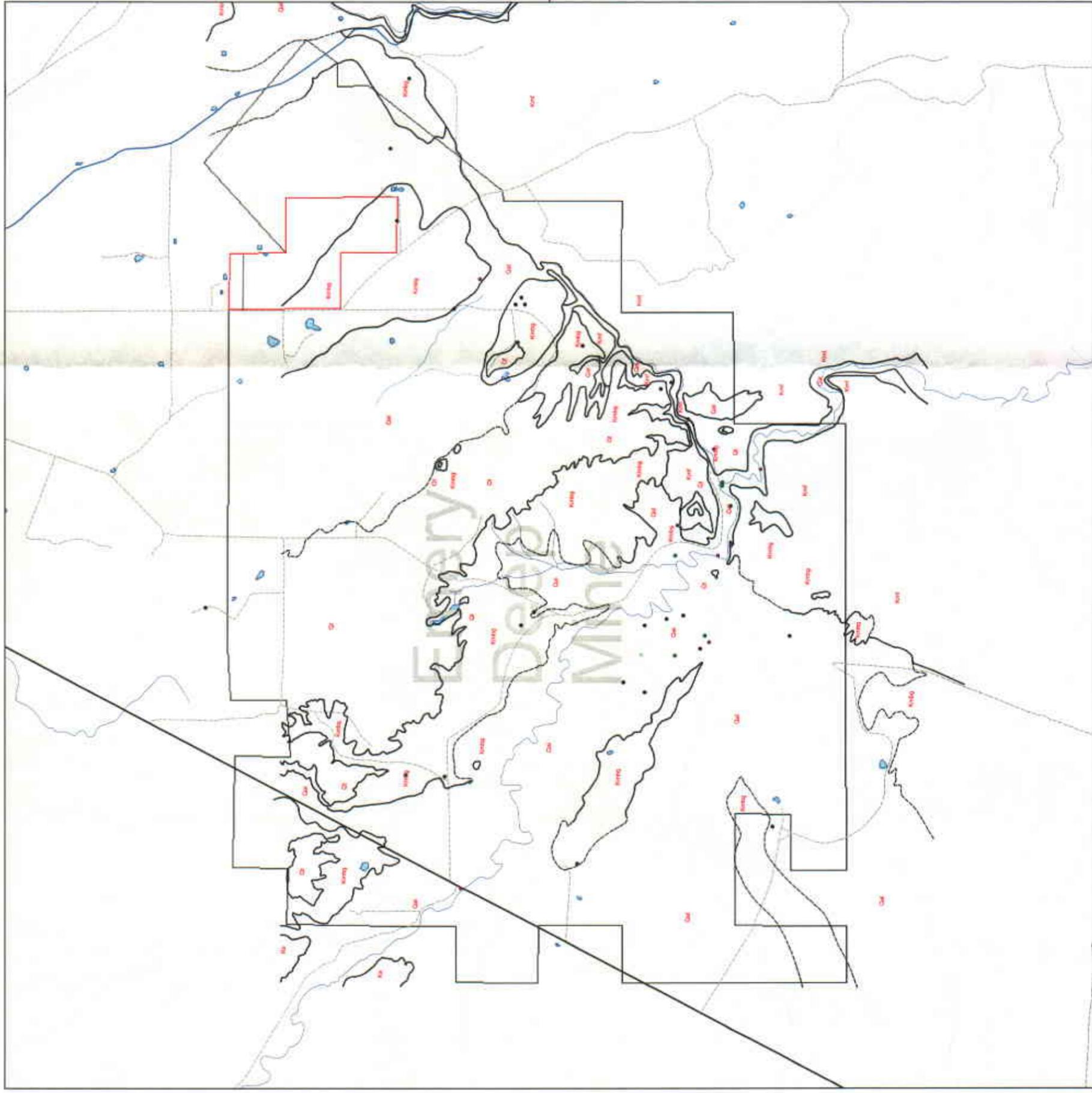
## Plate 2 - Workings Map

Mar. 2007

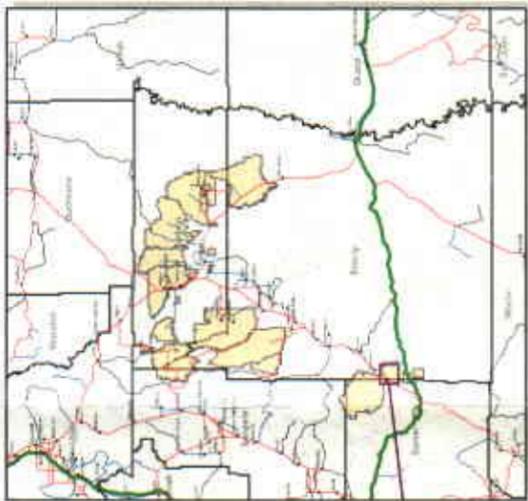
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- Drainage
- Green and hatched stream river bars
- Canal
- Ditch or canal
- Wash or ephemeral drain
- Apex point
- Intermittent stream (shaded stream number of stream)
- Dam or weir
- Tunnel
- Main Road
- Graded Road
- Dir Road
- View Bank
- CIA Boundary





CIA Areas



# Cumulative Impact Area Lower Quitchupah Creek Watershed

## Plate 3 - Geology Map

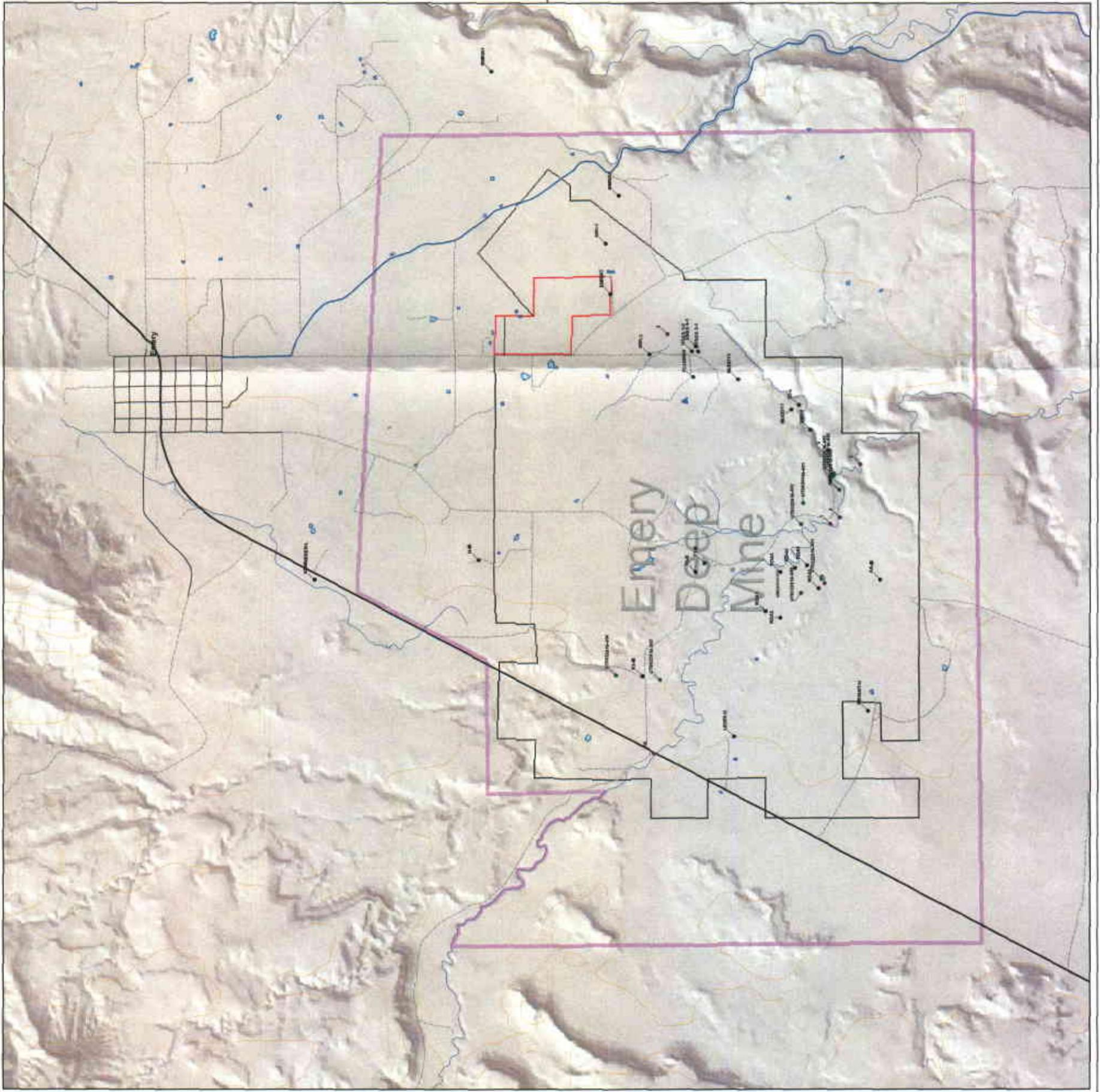
Mar. 2007  
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- |                |                 |             |
|----------------|-----------------|-------------|
| Spring         | US Route        | Permit Area |
| Permeable/Well | State Route     | STATUS      |
| Stream         | Primary Route   | ACT         |
| Lake/Sad Pond  | Secondary Route | ENC         |
| UPDES          | Main Ditch Road | IM          |
| Other          | Unimproved Road | PRO         |
| Inflow         | CIA Boundary    | REC         |
|                | Water Body      |             |

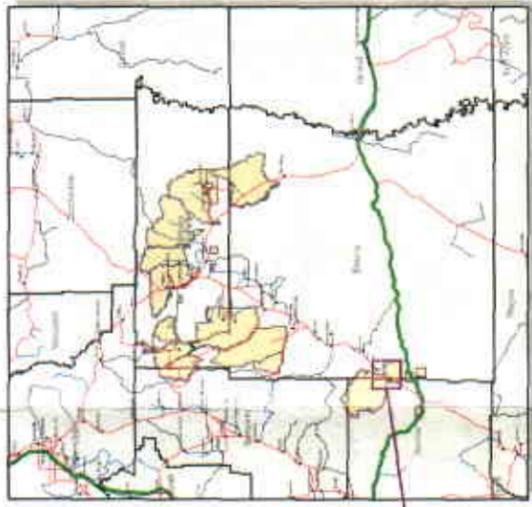
- TK01 - North-Horn Fm  
 K01 - Pinos River Fm  
 Kc - Castlegate Sandstone  
 K0h - Shoshone Fm  
 K0y - Star Pt Fm  
 K0n - Nevada Fm



SCALE: 0.18 0.37 0.74  
 1:10,000



CIA Areas



# Cumulative Impact Area Lower Quitchupah Creek Watershed

## Plate 4 - Hydrologic Map

Mar. 2007  
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- |                   |                   |                   |               |
|-------------------|-------------------|-------------------|---------------|
| ● Spring          | × Spring          | — US Route        | — Permit Area |
| ● Piezometer/Well | × Piezometer/Well | — State Route     | STATUS        |
| ● Stream          | — Stream          | — Primary Route   | ACT           |
| ● Lake/Sea Pond   | — Lake/Sea Pond   | — Secondary Route | EMC           |
| ● UPE's           | × UPE's           | — Main Ditch Road | INA           |
| ● Other           | × Other           | — Unimproved Road | PRO           |
| ● Inflow          | — Inflow          | — CIA Boundary    | REC           |
| ● Inflow arc      | — Inflow arc      | — Water Body      |               |

Legend

0 0.1 0.2 0.4 0.6

1:25,000

*Final*

UINTA SW UTAH COAL SITE SPECIFIC ANALYSIS

EMERY NORTH TRACT

January 18, 1980

*Covers Kingston tract*

RECEIVED

FEB 23 2007

DIV. OF OIL, GAS & MINING

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## I. INTRODUCTION

### A. Purpose and Need

Under the new coal leasing program, the Department of the Interior has combined all major Federal coal management responsibilities into one unified program in order to:

1. Give the nation a greater assurance of being able to meet its national energy objectives;
2. Provide a means to promote a more desirable pattern of coal development with ample environmental protection;
3. Assure that State governments and local communities participate in decisions about where and when Federal coal production will take place; and
4. Increase competition in the western coal industry.

The Secretary of the Interior's new coal program decision of June 1 and 2, 1979 has resulted in the setting of regional coal production goals and leasing targets for 1981. The tentative leasing target for the Uinta Southwest Utah Coal Region is 520 million tons of reserve base coal. In order to meet this goal, a proposal to lease individual coal tracts or combinations of coal tracts will be analyzed in a site specific analysis and Regional Coal EIS. This site specific analysis assesses the impacts of leasing 43.0 million tons of reserve base coal reserves from the Emery North Tract.

### B. Authorizing Actions

Leasing and development will be under the authority of the following laws: The Mineral Leasing Act of February 25, 1920, as amended; the Federal Land Policy and Management Act (FLPMA) of 1976; the Surface Mining Control and Reclamation Act (SMCRA) of 1977; the Multiple Minerals Development Act of August 13, 1954; the Department of Energy Organization Act of August 4, 1977; the National Environmental Policy Act (NEPA) of 1969; the Federal Coal Leasing Amendments Act of 1976, as amended; the Act of October 30, 1978 that further amended the Mineral Leasing Act of 1920, and regulations: Title 43 CFR Parts 3400, 3500, and 2800 and Title 30 Parts 211, and 700.

The Federal agency responsibilities for the leasing and management of Federal coal are listed on pages 1-18 through 1-36 in the Final Environmental Statement on the Federal Coal Management Program (April 1979).

The State and county responsibilities are listed on pages I-9, III-8 and III-12 of Part 1 of the Final Environmental Statement on the Development of Coal Resources in Central Utah (1979).

## II. PROPOSED ACTION AND ALTERNATIVES

### A. Proposed Action

The total acreage within the proposed logical mining unit is 2,201 acres in which the coal is owned by the Federal Government. Ownership of the surface and other minerals are 1,520.75 acres of Federal and 680.25 acres of

private land. The proposed action would be to lease 2,201 acres containing Federal coal resources. About 90 percent of the tract is believed to be underlain by minable coal, and it is also believed that surface mining would be the most efficient method for use over 40 percent of the tract. The tract is a logical mining unit as defined by Coal Lease Regulations 43 CFR 3400.5 (cc), either if mined independently or if mined in conjunction with adjacent coal land now under Federal and State lease.

**1. Description of Tract**

The Emery North Tract lies in Emery County, Utah, approximately 3 miles east of the town of Emery, 60 miles south of Price, Utah, and about 55 miles east of Salina, Utah. The legal description and ownership are shown in table 1.1. The general location is shown in maps 1.1 and 1.2.

TABLE 1.1

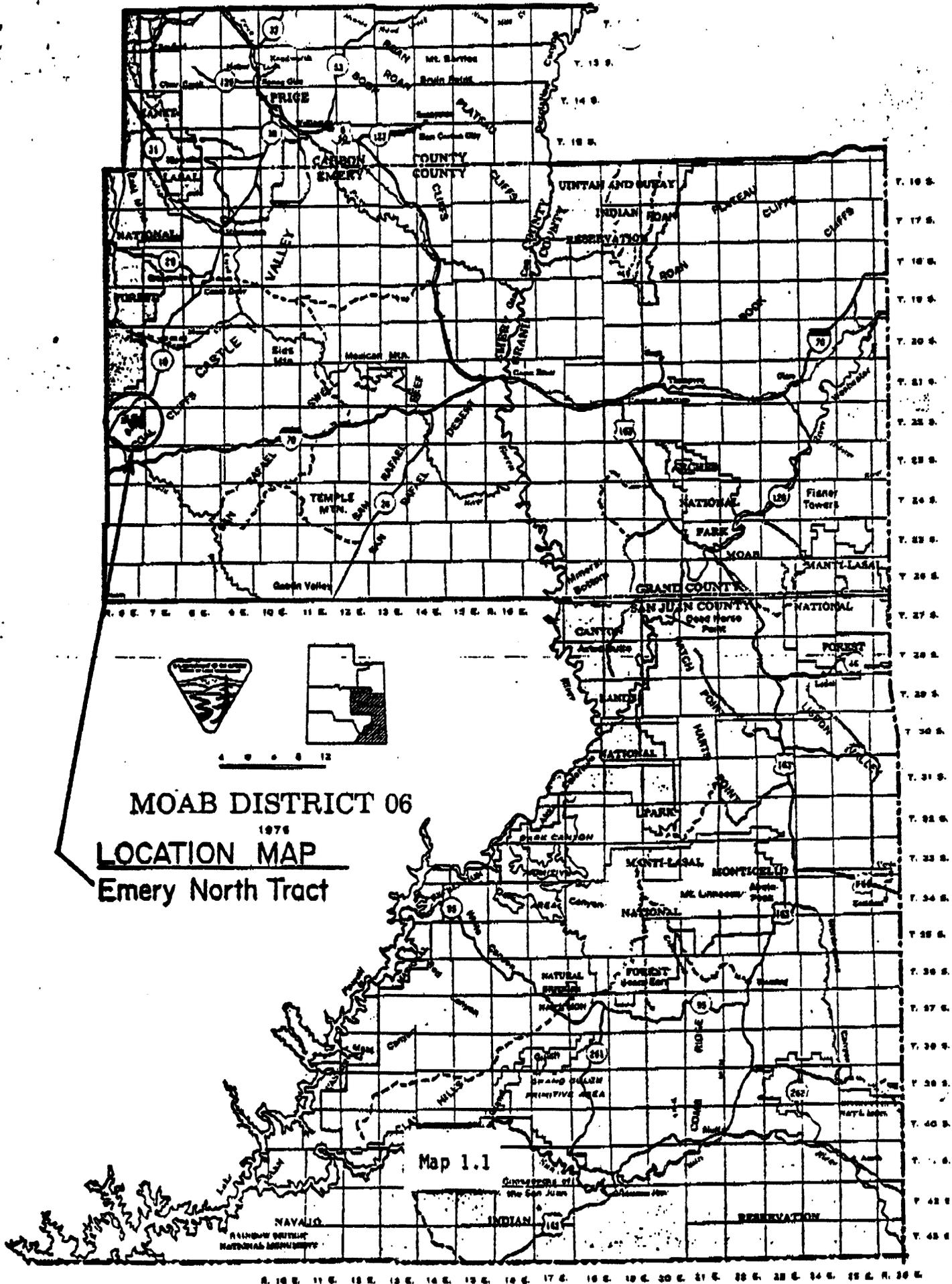
**TRACT LOCATION AND OWNERSHIP**

<u>Location</u>	<u>Surface Ownership (Acres)</u>			<u>Coal Ownership (Acres)</u>			<u>Legal Description</u>
	<u>Federal</u>	<u>State</u>	<u>Private</u>	<u>Federal</u>	<u>State</u>	<u>Private</u>	
<b>T22S - R6E SLB&amp;M</b>							
Section 1	240.75		80.25	321.00			Lot 1, 2, S 1/2 NE 1/4, SE 1/4
Section 10			40.00	40.00			SE 1/4 SE 1/4
Section 11	160.00		120.00	280.00			NE 1/4, E 1/2, SE 1/4, SW 1/4 NW 1/4
Section 12	440.00		40.00	480.00			NE 1/4, S 1/2
Section 13	560.00		80.00	640.00			ALL
Section 14	80.00		120.00	200.00			S 1/2 SE 1/4, SW 1/4 NW 1/4, NW 1/4 SW 1/4, SE 1/4 SW 1/4
Section 15	40.00			40.00			NE 1/4 NE 1/4
Section 22			160.00	160.00			SW 1/4 NW 1/4 N 1/2 SW 1/4
Section 23			40.00	40.00			SE 1/4 SW 1/4 NE 1/4 NW 1/4
<b>TOTAL</b>	<b>1,520.75</b>		<b>680.25</b>	<b>2,201.00</b>			

**Mineral Ownership**

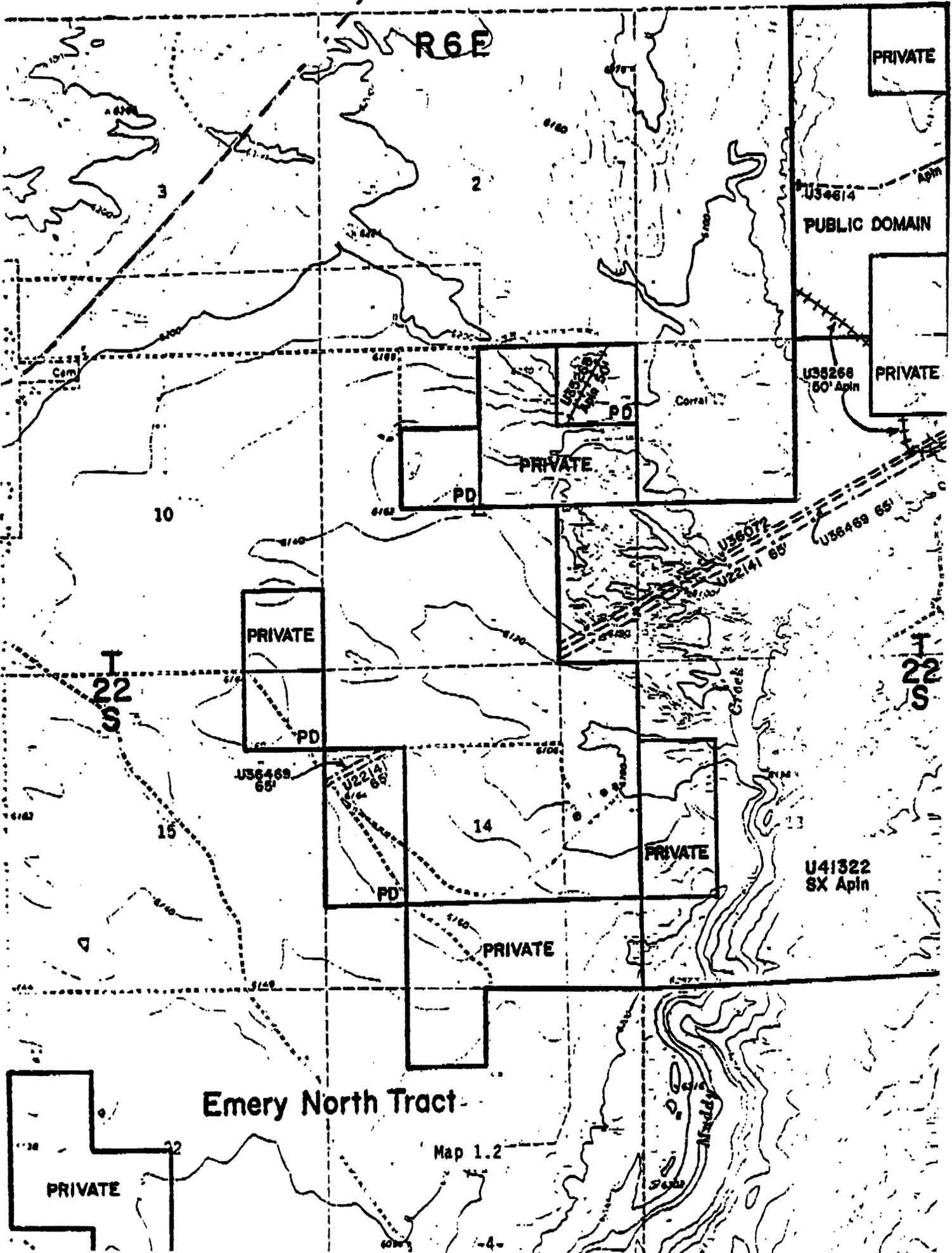
Minerals underlying the land having Federal surface ownership are entirely Federally owned. Minerals, aside from coal, underlying the land having private surface ownership are entirely privately owned.

The tract lies within the Emery Known Recoverable Coal Resource Area (KRCRA). Total reserve base coal of the tract is approximately 43,000,000 tons, of which 24,380,000 tons are



**MOAB DISTRICT 06**  
 1976  
**LOCATION MAP**  
 Emery North Tract

Map 1.1



recoverable. Of the total recoverable tonnage, 13,569,000 tons are recoverable by surface methods at an 85 percent recovery rate, and 10,820,000 tons are recoverable by underground methods at a 50 percent recovery rate.

The coal is classified as high volatile B bituminous coal. Coal analyses are not available in enough detail to reliably show coal quality by individual beds, but those analyses available are considered indicative of the average quality of the coal that would be produced. Coal samples available were taken by Consolidation Coal Company from a drill hole in the southeast corner of Section 2. Surface mining methods would be used for the first 20 years of production, and underground methods for the final 20 years of the mine's projected life. The estimated stripping ratio is 12.2:1. The coal data from the Consolidation Coal Company samples is shown in table 2.1 in the minerals section.

## 2. Projected Scope of Development

If the tract is leased, the coal would probably be recovered with both surface and underground mining methods. Movable thicknesses of the upper, or "I-J" seam underlie 1,286 acres of the tract, with 890 acres having less than 200 feet overburden, being considered strippable. The strippable area comprises the coal-bearing portions of Sections 12, 13 and 14 included in the tract. Remaining "I-J" coal in Sections 1, 11, 12, 13, 14 and 23 and in the outer parcels in Sections 10, 14, 15, 22 and 23 would probably be mined by underground methods. Movable thicknesses of the "C-D" bed underlie 1,943 acres of the tract. Of this coal land, 377 acres are considered strippable. Strippable coal occurs in Sections 12 and 13 around the outcrop in Muddy Creek Wash.

The remaining 1,566 acres of "C-D" bed coal land is considered to be more economically mined by underground methods. Since the interburden interval between the "C" and "I" beds varies from 135 to 173 feet, and the maximum stripping height for a single bed is considered to be 100 feet, it might be feasible to strip mine the "C" bed throughout much of the area in which the I bed was surface mined. Dragline stripping is efficient with one seam, but where both beds are mined it would probably be necessary to use shovels and trucks for uncovering the upper seam, or else use a second dragline to double handle waste from upper seam stripping. Surface mining of the shallow coal in the S 1/2 SE 1/4 of Section 14 would be inefficient unless done in conjunction with mining of adjoining private coal land. The various outlying parcels could also be mined best in conjunction with adjacent private land.

The tract could be mined both as an independent operation or in conjunction with adjoining land. It appears that much of the strippable coal for this locality is on the tract, but that the pit could be profitably continued into private coal land in Sections 14 and 23.

The production schedule envisions surface mining of 678,000 tons per year during an initial 20 years of operation. Following this, as strippable coal is depleted, a shift would be made to underground production and 541,000 tons per year would be mined during the following 20 years. About 15 additional drill holes will be needed to provide information for detailed mine planning. Of these, only seven would have to be reclaimed, since the others are on land where strip mining is probable.

Surface mine production at the proposed rate of 678,000 tons per year could probably begin within 2 years of the start of construction, at which time the initial cut should have been made and the dragline put in operation. During the 20 years of planned surface mine operation, it is projected that 835 acres of upper bed coal and 377 acres of lower bed coal would be mined. Some of the strippable lower bed coal underlies upper bed coal. The total surface disturbed is estimated at 1,000 acres, or 50 acres per year. Backfilling by dragline can be safely done within about 500 feet of men and equipment working in the lower coal bed. This is equivalent to about 2 years of mining activity, so that after the mining cycle was established, reclamation can be brought up to about 2 years behind production. An estimated 40 of the 50 acres disturbed yearly by mining could be contoured for reclamation within the following years. An additional 50 acres of the mine area would be reclaimed during the early years of underground mining when fewer access roads are needed. The remaining roads and cuts must be left open to provide road access until surface mining is complete. The projected averages utilized for mining development and facilities are shown in table 1.2.

Reclamation of much of the surface mined area could proceed during mining as backfilling is completed. Areas can be contoured, topsoil spread and vegetation reseeded. However, restoration of a considerable portion of the area, perhaps one-fifth, will have to await completion of surface mining and one-seventh completion of underground mining. Surface mining, using a dragline, would require access roads on both ends of the pit and a wide buffer zone between reclamation work and active mine work. With the end of surface mining, part of the roads could be reclaimed and mined land reclamation brought up to a few hundred feet of the final surface cut where portals and other facilities for underground mining would be located. Final reclamation of the roads and final backfilling of the pit would have to await completion of underground mining.

A surface plant containing offices, maintenance shops, warehouse, change house and coal storage and truck loading facilities would be constructed on 20 acres in the N 1/2 SE 1/4 NW 1/4 of Section 11. Access and highway haulage requires 2 miles of surface road connecting with Highway 10 at Emery. Two miles of mine haulage road for off-highway vehicles would extend to the edges of the surface mine in the southwest corner of Section 13 and the south portion of Section 12. Haulage roads would be constructed down to the coal seams in the pit floor as the initial cuts are excavated.

Underground mining would be initiated from the pit floors when the maximum stripping depth was reached in each seam. The exposed coal seams in the pits would allow low cost access on fresh coal by as many entries as desired.

Underground mining would result in very little new surface disturbance. The same facilities would be used that would be constructed for surface mining. Most of the new facilities, such as portals, would be located on land in the surface mine where reclamation was already required. However, shafts for additional ventilation would be needed. All mining in the outlying parcels would be by underground methods. They should be mined in conjunction with adjoining coal lands. Separate mining would probably be impractical without right-of-way agreements with owners of adjoining land. Otherwise, new surface and underground access would be needed for each parcel.

Temporary employees needed during the construction period would be about 15 for 1 year. About 65 to 75 permanent employees would be needed during the surface mining period, and 120 to 155 employees will be needed for underground mining. An estimated 65 transportation employees would be needed to truck coal to Mohrland or Salina during the surface mining period, and 52 would be needed during the underground production period.

### 3. Relation of Tract to Planning and Unsuitability Criteria

The lands within the Emery North Tract have been found suitable for coal leasing subject to certain restrictions required by the application of unsuitability criteria numbers 7 (Historic Lands and Sites), 9 (Federally Listed Endangered Species), 14 (Migratory Birds) and criteria 16 (Flood Plains). The Muddy Creek flood plain and Rochester-Muddy petroglyph site are considered unsuitable for leasing. The exceptions to unsuitability criteria numbers 9 and 14 apply, which require that BLM consult with the U. S. Fish & Wildlife to obtain a final determination as to the suitability of this tract for coal leasing. The only additional land use controls that apply to this tract are the Emery County zoning regulations which have categorized these lands as open to mining and grazing (M&G-1).

### 4. Relation of Tract to Development Near the Tract

Consolidated Coal Company is now operating their Emery (Browning) underground mine 2 miles southwest of the tract. They own fee land west and north of the tract. They are likely lease sale bidders, and they could mine the tract efficiently in conjunction with their present coal land holdings. The outlying parcels included in the tract could only be efficiently mined in conjunction with the surrounding Consolidated holdings.

The Hollberg Preference Right Application, now controlled by Atlantic Richfield Company, borders the tract on the northeast. The portion of this tract in Section 1 could be mined efficiently in conjunction with the Hollberg property using underground methods.

### 5. Legal and Regulatory Requirements as Part of the Proposed Plan

If leased, the successful lessee will have to comply with all Federal, State and local regulations, laws and policies as they affect the leasing and development of coal. Some of the primary laws governing the leasing and development of Federal coal are: Mineral Leasing Act of 1920 as amended, Federal Coal Leasing Amendments Act 1976, and the Surface Mining Control Land Reclamation Act of 1977. In addition to these laws governing coal development, there are several laws providing the basis for resource management and protection on the Public Lands and National Forests. These are the Federal Land Policy Management Act of 1976 (90 Stat. 2743; 43 U.S.C. 1701-1771), Organic Act of June 5, 1897 (30 Sta. 34, as amended; 16 U.S.C. 473-482, 551) and Multiple Use-Sustained Yield Act of June 12, 1960 (74 Stat. 215; U.S.C. 528-531).

These laws are implemented by the Bureau of Land Management (BLM), Forest Service (FS), the Geological Survey (GS), and the Office of Surface Management (OSM), under the following regulations:

Title 43 CFR Part 3400 provides procedures to ensure that adequate measures are taken during exploration or surface mining of the Federal coal (among other minerals) to avoid, minimize, or correct damages to the environment and to avoid, minimize, or correct hazards to public health and safety.



Title 43 CFR Part 3400 provides procedures for leasing and subsequent management of Federal coal (among other minerals) deposits.

Title 43 CFR Part 2800 establishes procedures for issuing rights-of-way to private individuals and (or) companies on public lands.

Title 30 CFR Part 211 governs operations for exploration, testing, development, and recovery of Federal coal under leases, licenses, and permits pursuant to 43 CFR Part 3400. The purposes of the current regulations in Part 211 are to promote orderly and efficient operations and production practices without waste or avoidable loss of coal or other mineral bearing formation; to encourage maximum and use of coal resources.

Title 30 CFR Part 700 requires coal mining operations as a minimum, to restore the lands affected to a condition capable of supporting the use of which there is reasonable likelihood. Mining and reclamation plans would not be approved unless the applicant has demonstrated that reclamation to the proposed post mining land use can be accomplished under the mining and reclamation plan.

For a more complete and detailed listing of laws affecting coal leasing and development, see the Final Environmental Statement on the Federal Coal Management Program (p. 1-15 through 1-23).

#### 6. Site Specific Assumptions

- a. Mine life is defined as exploration through end of production.
- b. The construction phase would take 1 to 2 years to complete.
- c. Preliminary reclamation on an area is considered completed when disturbed lands have been backfilled, graded, contoured and seeded (approximately 2 years).
- d. Complete reclamation of an area would occur on the following schedule:
  1. An estimated 2 years for filling, shaping, contouring, seedbed preparation and seeding.
  2. Approximately 5 years would be required for establishment of vegetation cover of the seeded species which would support small animals and birds.
  3. Establishment of shrub cover would require 15 to 20 years.
- e. Short term is defined as mine life plus 5 years. Long term is defined as that time beyond the short term in which impacts would continue to occur.

f. Approximately 100 acres would be used for housing and infrastructure per 1,000 population.

g. Access roads, powerlines and telephone lines were not included in final reclaimed acres because of the possibility of their continued use.

h. Rights-of-way width requirements:

Access road - 100 feet  
Powerline - 30 feet  
Telephone cable - 12 feet

i. Post mining land use would consist of restoring or enhancing the existing level of livestock grazing and wildlife habitat. The current levels of outdoor recreation activities such as hunting, sightseeing and ORV use, would be included as objectives in a post mining land use plan.

## B. Alternative(s)

### 1. No Action

Assessment of taking no action is required by CEQ regulations contained in the Federal Register notice of November 29, 1979. Under the "No Action Alternative", the tract would not be leased. Coal development would not take place and ancillary facilities would not be constructed. Approximately 13,569,000 tons of coal recoverable with stripping methods and 10,820,000 tons recoverable with underground methods would not be utilized. Use of the surface and of resources, other than coal, would continue in the present manner.

### 2. Mining the Total Tract With Underground Mining Methods

Using underground mining methods only, 17.2 million tons of coal would be recovered as opposed to 24.4 million tons using the combined surface and underground methods. Approximately 7.2 million tons of coal would not be recovered. There would be less than 100 acres disturbed on the 2,201-acre tract if it is totally mined with underground methods. This compares to approximately 1000 acres of surface disturbance that would occur as a result of the proposed action. However, it may not be geologically, technically, or economically feasible to underground mine the total tract due to the relatively shallow depth of the coal on over 50 percent of the tract. Also, the adjacent private land ownership pattern would inhibit the underground mining of the tract by controlling access, transportation, and mine facility locations.

## C. Further Environmental Assessment Points

The successful lessee must submit a plan for mining and reclamation (M&R) to the Secretary of the Interior, Office of Surface Mining (OSM) for the review and approval within 3 years after leasing. Once a mining plan has been submitted, OSM, BLM and GS would review the developments proposed in the mining plan. If necessary, OSM would then prepare a site specific environmental assessment prior to the approval of the mine plan. Additional environmental assessments for rights-of-way or special land use permits associated with ancillary facilities may be required of the surface managing agency before the development of Federal coal on this tract.

### III. EXISTING ENVIRONMENT

#### A. Affected Environment

##### 1. Climate

The tract lies just to the east of the Wasatch Plateau, which rises to an elevation of over 11,000 feet. The climate is semiarid (steppe), characterized by low relative humidity, abundant sunshine, low precipitation, warm summers and cold winters.

Data recorded from 1941 to 1970 at Emery about 3 miles west of the tract at 6,210 feet show an annual average precipitation of 7.64 inches. Winter precipitation is light because the Wasatch Plateau depletes the moisture source. The principal precipitation season is summer when moist tropical air masses occasionally move into the region, resulting in thunderstorm activity. November is the driest month, averaging only 0.41 inches of precipitation. August is the wettest month, with an average of 1.17 inches.

January is the coldest month, with a mean daily maximum of 37.4 degrees F and a mean daily minimum of 11.3 degrees F. July is the warmest month with a mean daily maximum of 84.0 degrees F and a mean daily minimum of 52.3 degrees F. The average frost-free period is 132 days.

##### 2. Air Quality

Air quality in the vicinity of the tract is expected to be good, although no measurements have been made. There are no large population centers or industrial sources nearby. The largest industrial sources in the region are the Huntington and Hunter (Emery) coal-fired electric powerplants located about 32 miles and 21 miles northeast of the tract.

The closest air quality monitoring site is located near the Emery powerplant in Castle Dale, 24 miles northeast of the tract where the State of Utah is monitoring sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>) and total suspended particulates (TSP). As shown in table 2.1, SO<sub>2</sub> and NO<sub>2</sub> concentrations were well below the National Ambient Air Quality Standards (NAAQS). Concentrations approaching the NAAQS for TSP were recorded at Castle Dale, but it is expected that a major portion of the TSP concentration was associated with suspended soil particles.

The other pollutants for which NAAQS have been promulgated are carbon monoxide (CO), ozone and lead (Pb). No CO or Pb data are available for the region, but levels are expected to be low.

Visibility - The BLM has been monitoring visibility by the photographic method at the south end of Cedar Mountain 37 miles northeast of the tract. The average visibility recorded from November 1976 to March 1979 was 8.5 miles (NOAA draft report). The tract and surrounding areas are designated Class II under Prevention of Significant Deterioration of Air Quality (PSD). The closest Class I area is Capitol Reef National Park, about 25 miles south of the tract.

TABLE 2.1  
COMPARISON OF MEASURED POLLUTANT CONCENTRATIONS

Pollutant	Location		NAAQS		
	Castle Dale	Salt Wash			
	Concentration ( $\mu\text{g}/\text{m}^3$ )	Percent of NAAQS	Concentration ( $\mu\text{g}/\text{m}^3$ )	Percent of NAAQS	
Annual average	43 a)	70		60	
Maximum 24-hour average	12 a)	80		156	
<u>SO<sub>2</sub></u> Annual average	0-13 b)	0-16		80	
Maximum 24-hour avg.	52 b)	15		365	
Maximum 3-hour avg.	208 b)	16		1300	
<u>NO<sub>2</sub></u> Annual average	0-10 b)	0-10		100	
Ozone maximum 1-hour average			134	55	240

a) October 1978 to September 1979

b) July 1978 to June 1979

#### Trends in the Affected Environment

No climatic changes are anticipated. Energy related growth is expected to cause deterioration of air quality from its present high quality. Construction of coal-fired powerplants (1,000 MW) near Wellington and Green River, a coal gasification plant near Emery, and a nuclear generating facility near Green River are being considered. Whether these facilities will be constructed is unknown at this time. Increased coal production from existing leases is expected. Increased pollution levels in towns and cities is anticipated due to emissions associated with increased human activity. Some increase in haziness and decrease in visibility is expected from increased industrial activity and associated population growth.

**3. Topography, Geology and Paleontology**

The tract is located on a cuesta at an elevation of 6,400 to 6,850 feet. Drainage systems have cut canyons with a relief of 600 to 800 feet. Further to the west is the Wasatch Plateau, while to the east is the San Rafael Swell. The tract is situated on the western flank of the San Rafael Swell, a breached doubly plunging anticline.

The Ferron Sandstone Member of the Mancos Shale is the main coal-bearing formation in the area and dips 2 to 4 degrees to the west. The Ferron Sandstone contains 13 different coal seams, of which only the "D" and "J" seams are considered to be of minable thickness on this tract. No faults of any consequence are located on the tract.

The Ferron Sandstone contains fish, reptiles, clam, snail, oyster, ammonoid, echinoderm, and foram fossils, as well as plant remains associated with the coal (Robison, 1977). The scientific value of any undiscovered fossils is unknown; however, no exceptional sites have been located.

**Trends in the Affected Environment**

There are no existing or anticipated actions which would change the topography, geology, or paleontology of the resources on the tract.

**4. Minerals**

The coal is considered to be high volatile B bituminous in rank. Coal data are summarized in table 2.2.

TABLE 2.2  
COAL DATA SUMMARY

**QUALITY**

Btu per pound .....	10,056 (as received)
Ash (percent) .....	22.01 "
Moisture (percent) .....	6.89 "
Sulfur (percent) .....	0.96 "
Volatiles (percent) .....	33.99 "
Fixed Carbon (percent) .....	37.11 "

<u>Quantity</u>	<u>"1-J" Bed</u>	<u>"C-D" Bed</u>
Thickness of Seam (avg. feet)	7.2	7.5
Total Reserves Base (tons)	16,760,000	26,240,000
Recoverable Reserves (tons)		
Surface @ 85 percent recovery	9,230,000	4,326,000
Underground @ 40 percent rec.	2,360,000	8,460,000
Minable Area (acres)	1,290	1,935
Depth of Seam (feet)	0-400 +	0-500 +

The only other minerals of possible interest would be uranium and petroleum. Most of the tract is covered by oil and gas leases; however, no oil or gas wells have been drilled on the tract (Hansen and Scoville, 1955; Heylman, Cohenoun and Kayser, 1965). Uranium deposits have been found in the Morrison Formation which occurs stratigraphically over 1,000 feet below the Ferron Sandstone, but deposits have been found in the vicinity of the tract.

### Trends in the Affected Environment

Underground coal mining is now occurring at the Old Browning Mine in Section 33. Other coal reserves are being evaluated and proposed for leasing in the area. Some of these include the Emery North, Emery South and Holberg PRLA Tracts. It appears the area will experience additional coal development in the future.

### 5. Soils

Soil information for the Emery North Tract is published in the Soil Survey Carbon-Emery Area, Utah, USDA, SCS, December, 1970. Table 2.3 illustrates the soil associations found on this tract, the dominant soil series of the associations, erosion, and reconstruction potential. The information provided is general and not meant to replace onsite investigations or more intensive soil surveys on impacted areas.

The two soil associations most affected by the strip mining activities are the Chipeta-Persayo-Badland Association and the Rock Land Shaly Colluvial land, Castle Valley-Kenelworth Association. There are no alluvial valley floors located on the tract, but there would be an estimated 110 acres of agricultural land taken out of production if surface-owner consent is given for development.

The Chipeta-Persayo-Badland Association is gently sloping and gently rolling to steep, well drained, moderately fine textured and medium textured soils that are shallow over gypsum bearing shale. The Rock land-Shaly Colluvial land-Castle Valley-Kenelworth Association is made up of benches and hills, dissected in places by deep ravines. This association is located along and surrounding the Muddy Creek. Rock land and shaly colluvial make up about 60 percent of this association. Rock land mainly consists of very steep to perpendicular sandstone and shale outcrops. Where there is soil material, the surface is more than half covered by coarse fragments. The shaly colluvial land contains fewer rock outcrops than rock land. The outcrops present are mainly shale. The Castle Valley soil is very shallow and stony and the Kenelworth soils are deep, stony and moderately coarse textured.

Because of climatic and soil conditions, 10 to 30 percent of annual revegetation attempts are expected to be successful based on the Interim Guide for Rating Soils According to Their Soil Suitability for Rangeland Seeding, Hagihara and others, 1972. The primary constraints are: the aridity of the area, lack of volume of soil resources, stoniness and high pH. Revegetation studies have been conducted in this tract on simulated reclaimed soils. The primary consideration for revegetation appears to be drought. The results of these revegetation trials using different soil treatments, species and management is published in the EMRIA Report No. 16, Reclaimability Analysis of the Emery Coal Field, Emery County, Utah, Bureau of Land Management.

TABLE 2.3

SOILS OF EMERY NORTH TRACT

Mapping Unit	Dominant Soils Unit and Textural Family	DEPTH			SOIL EROSION POTENTIAL			Percent Acres Mapped of Tract	Soil Reconstruction Potential	Soil Hazard Conditions
		Shallow 0 - 20 inches	Moderately Deep 20 - 40 inches	Deep 40 + inches	Water K factor	Erodibility Group	Wind			
Saltair-Libbings Assoc.	Saltair (65%) Libbings (20%)		X	X	.47 high	4L		Poor	Excess lime saline clayey erodes easily	
Samete-Minchey Assoc.	Samete (57%) Minchey (23%)	X			.43			Poor		
Chipeta-Persayo-Badland Assoc.	Chipeta (30%) Persayo (30%) Badland (13%)	X			.10-.28 low-mod.	8		Fair	Lime	
Rock land-shaley colluvial land-Castle Valley-Kenelworth	NO DATA				.32-.37 moderate	4L		Fair	Lime, stones	
Rock land-shaley colluvial land-Castle Valley-Kenelworth	NO DATA				.43 high	4L		Poor	Saline, erodes easily	
Rock land-shaley colluvial land-Castle Valley-Kenelworth	NO DATA				.49 high	4L		Fair	Excess lime, erodes easily, clayey, saline slopes	
Rock land-shaley colluvial land-Castle Valley-Kenelworth	NO DATA				.37 moderate	8		Poor	Excess lime, erodes easily, stones	
Rock land-shaley colluvial land-Castle Valley-Kenelworth	NO DATA				.17 low	8		Fair-Poor	Excess lime, stones	

The soil reconstruction potential for revegetation is based on several factors of soil characteristics (National Soils Handbook, Part II, 403.6). Based on the limited soil resources present in the area affected by the stripping, the reconstruction potential is rated poor to fair. Most soils are shallow, have a lime excess, high erodibility, and stony. Some soils also have a severe salinity problem.

Analysis of the total volume of available topsoil (EMRIA Report No. 16, 1979) indicates a lack of the recommended minimum topsoil for restoration due to the thinness of topsoil cover over some of the strippable areas. Secondly, greenhouse and geochemical tests indicate that the ground overburden is the poorest growth medium. In addition to being nutrient deficient, this overburden contains toxic levels of at least boron. Because of this problem, using overburden for topsoil must be very selective.

Erosion potential for the stripped area is high. Although Castle Valley is rated as having a moderate water erodibility factor (K value), when this is compared to the allowable soil loss (T value), the erodibility is quite significant. Wind erodibility factors can range from moderately high to low.

#### Trends in the Affected Environment

Estimates of sediment yields using the Universal Soil Loss Equation could range from 0.21 tons per acre per year to 2.24 tons per acre per year. Using an estimated cropping factor and comparing this to disturbed soil estimates, erosion rates could increase as much as 6 to 10 times for disturbed areas.

#### 6. Water

Surface Water: Regionally, the Emery North Coal Tract is located in the southern end of Castle Valley within the Muddy Creek Watershed of the Dirty Devil River Basin.

Muddy Creek is a perennial stream that passes through the west side of the tract into the middle of Sections 12 and 13. Runoff from the tract is into Muddy Creek. The majority of the channels on the tract are ephemeral, going into a few intermittent tributaries of the Muddy. The lowland Muddy Creek channel grade is only 30 feet per mile. Surface runoff from the tract represents approximately one percent of Muddy Creek average annual runoff. This translates to 0.48 area inches or 88 acre-feet. Table 28 of EMRIA Report No. 16 shows mean monthly and annual water budgets for the Emery subarea.

The Muddy Creek floodplain covers a broad area in Section 12 but goes into a more restricted channel in Section 13 as it passes through the tract. GS conducted a flood frequency analysis for Muddy Creek for the 100 and 500-year peak flows. The 100-year peak flow is 4,590 CFS which is 1.2 feet above the medium flow. The 500-year peak flow is 6,390 CFS which is 15.1 feet above the medium flow. This flood hazard should be considered in all actions involving the flood channel.

Water Quality: Surface water quality is of lower quality than the underlying aquifers. The high total dissolved solid values put the surface water into a classification ranging from slightly saline to moderately saline water. More specific water quality sampling information is contained in the Appendix.

**Water Quality:** The quality of the groundwater varies from locality to locality. Water in the Ferron Sandstone below the "I-J" coal is apparently better quality than water in the underlying and overlying shales and water in streams. Around the town of Emery, water from the Ferron Sandstone is used for municipal and culinary uses. The quality of water from wells closer to the tract site ranges from slightly saline to very saline. While the groundwater may be suitable for some mining operations, it would have to receive treatment to make it useable for human consumption. Due to their salinities, some of these waters are now usable only for stock watering.

Seasonal Water use is provided by Muddy Creek for livestock and wildlife. Muddy Creek is also diverted by Station 9-3305 and is channeled to Emery for irrigation purposes. Croplands surrounding Emery are supported by this diversion. There are a few surface ponds on the tract.

Surface water use of the tract area is typical of small farming communities. The quantity of water applied annually to croplands averages 3.6 acre-feet per acre, according to reports of the Utah Division of Water Resources (1975, 1976). Coal-fired electric powerplants to the north, in operation or under construction, will use about 62,000 acre-feet per year, not all of which is consumed.

**Groundwater -** The general conditions of occurrence of groundwater for the tract is show in figure 83, page 193 of EMRIA Report No. 16. Groundwater is found in the Ferron Sandstone Member of the Mancos Shale. These are Cretaceous sedimentary rocks. The Ferron Sandstone Member is a municipal aquifer. It is of major significance to Emery because it provides potable water. Another aquifer-type found in the area is a shallow or perched aquifer formed by the Quaternary alluvium river terrace deposits and deeply weathered sandstone, then up the Blue Gate Shale and siltstone units of the Mancos Shale. The shallow or perched aquifer is around the tract.

Groundwater recharge area is along the east side of the Wasatch Plateau (see figure 80 of EMRIA Report No. 16). The groundwater movement is from the mountains and foothills to the east and southeast and discharges into the Muddy. Recharge to these aquifers is sustained by snowmelt and rainfall. Another source of recharge is from local irrigation practices.

Groundwater is a major contributor to streamflow and it provides the continuity of base flow in the perennial stream as well as the seeps, wet pasturelands and springs between the town of Emery and the tract.

A general groundwater availability map (figure 83 on page 193 of EMRIA Report No. 16) showing potential well yields was made by GSC. The map shows the Ferron Sandstone Member potential well yields of 5 to 50 gallons per minute (gpm), with the shales not being significant as a source of water. However, wells which intersect major fractures, particularly near the Joe's Valley Paradise fault zone, may yield as much as a few hundred gpm. The Emery municipal well and the Kemmerer Coal Company well, which are both artesian, are two good examples. On September 10, 1975, the GS Water Resources Division measured a flow of 375 gpm from the Emery municipal well without pumping, and on May 3, 1973, Layne Western Company measured a flow of 343 gpm while pumping from the Kemmerer Coal Company well.

Groundwater is used by the city of Emery and local individuals for potable water supplies. It is also used for irrigation, stock and wildlife purposes. Water from both wells and springs are utilized.

### Trends in the Affected Environment

Surface water and groundwater within the tract site would remain unaffected if mining did not take place. The water conditions would probably remain static, varying only with the climatic conditions.

#### 7. Vegetation

Throughout the Central Utah Region, precipitation is the principal factor controlling the distribution of major vegetation types. Although portions of the Emery North Tract lie at more than 6,000 feet in elevation, they lie in the rain shadow of the Fish Lake Mountains and receive only 7 to 8 inches of annual precipitation. The severity of the arid climate is accentuated by the seasonal rainfall distribution which peaks in July to August when air temperatures and evapotranspiration potential are at a maximum. Another result of the arid conditions is high soil salinity which is produced by the upward migration of groundwater towards the land surface where it evaporates, leaving salts in the upper soil horizons. Part of the area consists of steep talus slopes with unweathered rock debris around the perimeter of the benches. Soils derived from such materials are juvenile and consist of very coarse, thin veneers where present, with little or no organic component. Thus, naturally occurring environmental conditions are very harsh. At the same time, it is these conditions which create the habitats to which the natural vegetation has become adapted. Potential for reclamation is contained in the Emery EMRIA Report No. 16.

There are four major vegetation community types on the Emery North Tract: salt desert shrub, pinyon-juniper woodland, saline or alkaline moist area (greasewood) community and agricultural lands (table 2.4).

The salt desert shrub community is the most extensive, making up 59 percent (1,200 acres) of the tract. This community is the most prevalent type on the lower portion of the tract, and is common throughout the intermountain region. It is usually considered to be an edaphic climax on Saline Valley Soils (Holmgren, et al., 1973), but may also persist where salt concentration is relatively low. It is composed of low, widely spaced shrubs and perennial bunch grasses. Total vegetal coverage is 8 to 20 percent. The composition of this type is variable, perhaps due to spatial variations in soil salinity; however, its appearance is quite uniform. Shadscale (Atriplex confertifolia) and galleta grass (Hilaria jamesii) have the highest coverage values in this community. Other species present are included in Appendix I.

The greasewood riparian community makes up 17 percent (340 acres) of the tract. Almost pure stands are found on the margins of Muddy Creek. It is found on heavy clay-rich, highly saline soils and is the principal phreatophyte of the Shadscale zone (Holmgren et al., 1973).

Pinyon-juniper woodland is the next largest community, making up 16 percent (320 acres) of the tract. Associated species are included in Appendix I.

The remainder of the tract, 8 percent (180 acres), is made up of agricultural lands. Most of these lands are planted to alfalfa, which is supported by irrigation.

TABLE 2.4

## GROUND COVER AND PRODUCTIVITY FOR EMERY NORTH TRACT

Community	Acreage	Percent	Average Ground Cover	Vegetative Productivity (lbs./acre) <sup>a</sup>
Salt Desert Shrub	1,200	59	60 percent veg. & litter 40 percent bare ground	525
Greasewood	340	17	70 percent veg. & litter 30 percent bare ground	695
Pinyon-juniper	320	16	70 percent veg. & litter 30 percent bare ground	1,000
Agricultural	180	8		
TOTAL	2,040	100%		

<sup>a</sup> Estimated Yield

Source: EMRIA Report No. 16, 1979

#### Threatened and Endangered Species

An inventory of public lands near Emery, Utah, underlain by potentially strippable coal reserves, was conducted during portions of May, June and September, 1979. The subjects of the survey were candidate threatened and endangered plant species as proposed in the 1975 and 1976 Federal Register publications, which were generated as a result of the Federal Endangered Species Act of 1973 (Public Law 93-205). Also included in the search were rare, unusual, or unique species which have been suggested for inclusion in future lists.

The survey of the approximately 20,000 acre KRCRA was conducted on a systematic section by section basis. The following potential or candidate threatened or endangered species were found to be present:

<u>Scientific Name</u>	<u>Recommended Status</u>
<u>Astragalus consobrinus</u>	Threatened
<u>Castilleja scabrida</u>	Delist
<u>Cryptantha jonesiana</u>	Threatened
<u>Cryptantha mensana</u>	Sensitive
<u>Hymenoxys depressa</u>	Threatened
<u>Parthenium ligulatum</u>	Delist
<u>Townsendia aprica</u>	Endangered
<u>Sclerocactus wrightiae</u>	Endangered

The occurrence of these species by township, range, and section for the Emery North Tract are shown in table 2.5.

TABLE 2.5  
LOCATION OF THREATENED AND ENDANGERED SPECIES

Township and Range	Section	Cryptantha jonesiana	Hymenoxys depressa	Lomatium junceum	Sclerocactus wrightiae
T22S, R6E	5			X	
	7	X			X
	11a				X
	12a				X
	14a				X
	18				X
	19				X
	23a				X
	35				X

a Sections with tract

Trends in the Affected Environment

The expansion of the pinyon-juniper woodland into other communities has been noted on the Emery North Tract and may possibly be attributed to heavy grazing. Research throughout the intermountain region has shown the expansion of woodland into heavily grazed sagebrush or shadscale communities (Arnold et al., 1964; Cottam and Stewart, 1940; Pickford, 1932).

In addition to outright conversion of shrubland, other areas show evidence of alteration in floristic composition and forage value, and possibly gross productivity, which may be due to grazing. Unpalatable shrubs, forbs and grasses have become established where the competition introduced from desirable browse plants have been reduced. Halogeton glomeratus, which was introduced from Central Asia, is common in the lower Shadscale zone and contains oxalic acid which may be toxic to cattle in large amounts. A prickly pear cactus (Opuntia polycantha) has become frequent in the upper Shadscale zone. The production value of the present vegetation is probably lower because of the past grazing history.

8. Wildlife

The proposed lease tract is located within low quality habitat for mule deer. A small number of deer can be found on or near the tract. These deer are permanent residents and occupy the area yearlong.

Deer density numbers have been estimated to be less than one deer per section (.72 deer/section) by Utah Division of Wildlife Resources (UDWR, Dalton, 1979). When compared to deer density numbers for the surrounding Manti and Bookcliffs deer herds, this number is extremely low. An average density figure for the Bookcliffs deer herd is 10.6 deer per section, while an average density figure for the Manti deer herd is 19.4 deer per section (UDWR, Dalton, 1979).

Muddy Creek is a perennial stream that flows through the proposed lease tract. UDWR has classified Muddy Creek as a nongame fish, Class 5 stream. It is of limited value as a fisheries. Fish species present are speckled dace, flannel mouth sucker, green sucker (blue head sucker) and roundtailed chub. The riparian zone along the Muddy Creek is important habitat for ducks, songbirds, deer, small mammals and raptors.

The endangered bald eagle is a winter resident of the region between mid-November and late March each year. Golden eagles may be found in the area year-round. To date, no concentrations of bald or golden eagles are known on the proposed lease tract. A bald eagle concentration area (roost site) has been identified near the junction of U-10 and I-70. Up to five bald eagles have been observed in one specific cottonwood tree (UDWR).

Peregrine and prairie falcons may occasionally be seen on or near the proposed lease tract. Both of these falcons are yearlong residents, and sighting of both species are fairly common in the Carbon-Emery County Areas. There are no known peregrine falcon, prairie falcon, or golden eagle aeries (nests) occurring on or near the proposed tract. Other birds of high Federal interest under that could occur on the tract include the golden eagle, prairie falcon, Ferruginous hawk, burrowing owl, Cooper's hawk, Western bluebird, and Scott's oriole. The use of this tract by any of these species would be considered as incidental. Therefore, the tract does not meet the criteria for classification as high priority habitat (USF&WS, 1979).

There are no known prairie dog colonies on the tract. Therefore, the possible occurrence of the black-footed ferret, which is on the threatened species list, or the burrowing owl, which is a species of high Federal interest is very remote. There are no other threatened, endangered or species of high Federal interest known to inhabit or migrate through the proposed lease tract (UDWR, Dalton and USF&WS, Johnson).

Other wildlife species found on or near the proposed lease area include cottontail rabbit, jack rabbit, bobcat, fox, coyote, small mammals such as and ground squirrel, woodrats, kangaroo rat, and several species of ducks and songbirds (perching birds). The American rough-legged hawk, which is not listed under Criteria No. 14, is present in the region and could occur on the tract. It could be affected by off site activities.

There are no wild horses and burros found on or near the tract.

### Trends in Affected Environment

Trends in wildlife populations and habitat quantity and quality are summarized in table 2.6.

TABLE 2.6  
WILDLIFE TRENDS

Species	Population Trend	Habitat Trend	
		Quantity	Quality
Mule deer	stable	decreasing	fair
Moose	cyclic	stable	good
Coyote	cyclic	stable	good
Fox	stable	stable	good
Rabbits	cyclic	stable	good
Raptors	increasing	stable	good
Ducks	stable	stable	fair

Source: (UDWR, 1979)

### 9. Cultural Resources

The best represented prehistoric culture in the area is the Fremont culture (A.D. 650 to 1300). However, remains of the Paleo-Indian (big game hunters, ca. 12,000 B.C. to ca. 5,000 B.C.), Desert Archaic (hunters/gatherers, ca. 6,000 B.C. to Ca. A.D. 650), and Ute-Southern Paiute (hunters/gatherers ca. A.D. 1100 to the historic period) phases are also known from the region and may exist in the area. One 40-acre National Register site (42Em 392, Rochester-Muddy petroglyphs) has been identified on the tract. Thirty-six other cultural sites have been identified within the tract boundaries, some of which are considered potentially eligible for the National Register, especially petroglyphs, rock shelters and some prehistoric lithic manufacturies.

The region was settled by Anglo-Europeans in the late 1870s and a few historic signatures and remains of early mining efforts exist on the tract and to the east and south. None are considered potentially eligible for the National Register.

Based on earlier industrial-related cultural inspections and a recent sample, it is estimated that between 40 and 150 cultural sites may exist on the tract. Because of the incompleteness of the archaeological survey which identified these sites, this number should only be regarded as an estimate of potential sites in the proposed area.

### Trends in the Affected Environment

Because of increased population, access and availability of four-wheel drive recreational vehicles, cultural sites have suffered increasing vandalism in recent years. On the other hand, industrial actions have had to mitigate cultural damage which may have resulted in loss of resources in the past.

## 10. Visual Resources

Visual Resource Management Class II, III and IV exists within the proposed tract. The tract area is predominately a buff and tan outcrop which contains the Muddy Creek and its containing cliffs of 200 to 400 feet. Primary vegetation is pinyon-juniper on the mesa top and singleleaf ash and perennial grasses below the cliff in the talus areas. The Class II designation basically comes from the fact that the tract is visible from I-70. This highway receives 1,690 vehicles per day, or approximately 616,580 per year. Class III is the northeast portion of the tract and Class IV is the western half of the tract. Class II designation is the most restrictive class in visual resource management, second only to Class I areas which are designated National Parks, Primitive Areas, and Wilderness Areas.

### Trends in the Affected Environment

A review of the visual resource management classification for the tract area will be undertaken in 1983 as a planning update for the San Rafael Grazing Statement. It is not expected to change the existing classification. Subsequent planning revisions occur, roughly, on a 4-year cycle. It is unforeseen what management decisions may be which would change the existing management classes.

## 11. Recreation

Recreation access from the north and south into the tract area is through public lands. Dispersed recreation activities occur within the tract on a seasonal basis with the majority of use occurring in the spring. Approximately 400 visitor days are expected to occur per year. Activities represented are artifact collecting, rockhounding, ORV use, picnicking, hunting small game, and some scenic sightseeing. There are no public or private recreation developments on or adjacent (within 5 miles) to the proposed mine area.

The Rochester-Muddy Creek Petroglyph Panel, a National Register Site of 40 acres, is found in the center of Section 13. This panel has received national exposure through its National Register and local publicity and publication in the National Geographic Magazine (January 1980). This panel has increasing popularity for scenic sightseers, cultural resource professionals, and photographers.

The Emery North Tract lies in the Wilderness Inventory Unit UT-060-012. This unit was part of an accelerated wilderness review through the intensive phase as part of the Intermountain Power Project Environmental Impact Statement. However, the Sierra Club has filed an appeal to the IBLA on the IPP accelerated wilderness determination to drop this area from further consideration. Until this process is completed, the tract lands are to be managed as potential wilderness under the Bureau's Interim Management Guidelines.

### Trends in the Affected Environment

Dispersed recreation will continue throughout the county. It will not be expected that anything but a minor increase would occur over a 30-year period in the delineated tract. Urban recreation demands are anticipated to increase steadily as a result of continued energy development in the area.

**12. Land Uses**

The major land uses on the Emery North Tract are livestock grazing, rights-of-way, oil and gas leases, with minor uses for firewood and fence posts. The tract contains portions of two allotments; the Bunderson and Lone Tree Allotment (table 2.7). There are 100 allotments in the San Rafael Resource Area, for a total of 80,418 AUMs. The Bunderson (27 AUMs) and Lone Tree (2,750 AUMs) Allotments combined have 2,777 AUMs. The 61 AUMs contained in the tract would be less than one percent of the two allotments.

TABLE 2.7  
GRAZING ALLOTMENTS IN THE EMERY NORTH TRACT

Allotment Name	Total AUMs	AUMs in Tract	Number of Users
Bunderson	27	27	1
Lone Tree	2,750	34	10
TOTAL		61	11

Four utility easements for powerlines and an application for a railroad right-of-way exist on the tract (table 2.8). A large block of land in the tract has a State exchange application pending (table 2.10).

TABLE 2.8  
RIGHTS-OF-WAY ON EMERY NORTH TRACT

Existing R/W	Number	Location	Length of R/W on Tract
UP&L 345 KV Power line	U-22141	T.22S-R6E	
		Sec. 14	.24 miles
		Sec. 11	.27 miles
		Sec. 12	1.08 miles
UP&L 345 KV Power line	U-36469	Sec. 14	.2 miles
		Sec. 11	.27 miles
		Sec. 12	1.1 mile
UP&L 138 KV Power line	U-36072	Sec. 11	.27 miles
		Sec. 12	1.08 miles
Emery Town TV FM Power line	U-34614	Sec. 1	.49 miles
		Communication Site	1.78 acres
-----			
R/W Application			
Castle Valley RR (D&RGW)	U-35268	T.22S-R6E	
		Sec. 11	.27 miles
		Sec. 1	.25 miles
		Sec. 12	.3 miles

TABLE 2.10  
STATE EXCHANGE APPLICATION

		State Exchange Appl.	Acres
T.22S., R6E., SLB&M			
Section 11, E 1/2 SE 1/4	U-41322		80
Section 12, S 1/2, S 1/2 NE 1/4, NW 1/4 NE 1/4	U-41322		440
Section 13, E 1/2, E 1/2 W 1/2, NW 1/4 NW 1/4, SW 1/4	U-41322		560
	Total		1080

There are three oil and gas leases on the tract (table 2.9).

TABLE 2.9  
OIL AND GAS LEASES ON EMERY NORTH TRACT

		Lease #	Acres
T.22-R6E SLB&M			
Section 1, Lot 2, N 1/2 SE 1/4, S 1/2 NE 1/4, SW 1/4 SE 1/4	U-33931		240.75
	U-42438		
Section 11, SE 1/4 NW 1/4, NE 1/4 NE 1/4, E 1/2 SE 1/4	U-33933		80.00
Section 12, S 1/2 S 1/2 NW 1/4, NW 1/4 NE 1/4	U-33933		440.00
Section 13, E 1/2, E 1/2 W 1/2, NW 1/4 NW 1/4, SW 1/4 SW 1/4	U-33933		560.00
Section 14, SW 1/4 NW 1/4, NW 1/4 SW 1/4	U-33933		80.00
Section 15, NE 1/4 NE 1/4	U-33933		40.00
	TOTAL		1440.75

Local residents use the pinyon-juniper woodlands as a source of fuel wood and fence posts.

Consolidated Coal Company is now operating their Emery (Browning) underground mine 2 miles southwest of tract. They own fee land west and north of the tract. The Hollberg Preference Right Application, now controlled by Atlantic Richfield Company, borders the tract on the northeast.

#### Trends in the Affected Environment

By 1985 livestock grazing on the tract will be under more intensive management in an effort to try to maintain and/or restore vegetation productivity to these lands. It is possible that, in the near future, 1,080 acres of the tract would be transferred to the State under a State exchange application.

Oil and gas exploration would continue in this area, which could increase the surface disturbance.

With the increased use of firewood as a home heating fuel, the demand for firewood from the tract will increase.

### 13. Transportation and Noise

About 1.9 miles of local secondary road gives access to Utah Highway 10 (U-10) at Emery, which in turn gives access to loadouts at Mohrland (50 miles) and Salina (50 miles). The local road presently carries very little traffic. On U-10 southward from Castle Dale and on Interstate Route 70 (I-70) from Fremont Junction into Salina, present traffic is well within the capabilities of the roads to carry it. North of Castle Dale on U-10, the two-lane road is presently overloaded into Price and has been recommended by the Transportation Planning Division, Utah Department of Transportation, for upgrading to four lanes. Present traffic congestion in downtown Salina would be relieved by a proposed extension of I-70 to a junction with U.S. 89 southwest of Salina.

#### Trends in the Affected Environment

Traffic on U-10 has been increasing very rapidly during the 1970's due to the completion of I-70 into Salina at its south end and due to energy related developments along its length. Traffic counts made in 1978 in most places exceed projected traffic for 1990 based on 1975 data. South of Castle Dale, traffic volumes have remained low (700-2,600 vehicles per day (vpd) in 1978) despite a large percentage increase. North of Castle Dale, however, 1978 average annual daily traffic (AADT) ranged from 2,800 to 7,450 vpd, from south to north, with a maximum of 9,500 vpd at the junction with U.S. 6 in Price, reflecting traffic increases of 18 to 22 percent per year since 1970. Although traffic projections reflecting base data developed for the present study are not now available, the consensus among UDOT staff members is that traffic volumes are not likely to continue to grow for long at recent rates.

### 14. Social Economics

The primary areas that would be impacted by the proposed action (PA) include the areas of Ferron-Clawson (Emery County), Emery-Moore (Emery County) and Price-Helper-Wellington (Emery County). These three areas would receive 92 percent of the total population impacts. The remaining impacts (8 percent) would occur in other communities in Carbon, Emery, Sevier, and Sanpete Counties.

Ferron-Clawson - From 1970 to 1978 the population of the area increased from 812 people to 1,480 (82 percent), an average annual growth rate of 10.3 percent.

Emery-Moore - From 1970 to 1978 the population of this area increased from 265 to 397 (50 percent), an average annual growth rate of 6.2 percent.

Price-Helper-Wellington - From 1970 to 1978 the population of this area increased from 12,934 people to 18,400 (42 percent), an average annual growth rate of 5.3 percent.

From a county perspective the majority of the impacts would occur in Emery County (81 percent). Approximately 11 percent of the population impacts would occur in Carbon County. The remaining increases would occur in Sanpete and Sevier Counties.

Growth and decline in Carbon County and to a lesser extent in Emery County has historically been linked with the coal industry. When the coal industry expanded so did the surrounding communities. The history of the Utah coal industry has been one of rapid expansion and decline. The most recent decline (1950 through 1970) was caused by the poor market conditions for coal. Today the industry is in the midst of rapid expansion. This has resulted from the increased utilization of coal for electricity generation as well as the national trend towards coal utilization (Robison, 1977).

Of the 275 people employed in the Ferron-Clawson area, 94 (34 percent) are employed in the agriculture sector. Trade and government are the second and third largest employers in the area, employing 76 (28 percent), and 47 (17 percent) people, respectively.

In the Emery-Moore area mining, agriculture, and trade are the largest employers. Total employment in the area is 246. Of this, mining provides 100 jobs (40 percent), agriculture provides 94 jobs (38 percent), and trade provides 14 jobs (5 percent).

Employment in the Price-Helper-Wellington area is mostly in the trade, government, and services sector. Of the 6,258 jobs in the area, trade provides 1,538 (25 percent) jobs, government provides 1,205 (19 percent) jobs, and services provides 925 (15 percent) jobs.

Trends in the Affected Environment

As the coal industry declined from 1950 to 1970, the population of Carbon and Emery Counties declined. For the foreseeable future the coal industry in Utah is expected to expand and prosper. Whether this expansion will again be followed by decline depends largely on the future energy technology and the extent to which it might replace coal. Population trends are shown in table 2.11.

TABLE 2.11

POPULATION BY COUNTY

County	1950	1960	1970	1978	Percent Change		
					1950-60	1960-70	1970-78
Carbon	24,901	21,135	15,261	20,200	-15.1	-27.8	+32
Emery	6,304	5,546	5,101	9,200	-12.0	- 8.0	+80

Source: (U.S. Bureau of Census, 1970)

The population of the areas to be affected have shown similar trends, although the Salina-Redmond-Aurora area was not significantly affected by coal mining before 1970.

Ferron-Clawson - The population is projected to be 2,179 in 1987, 2,251 in 1990, 2,319 in 1995, and 2,257 in 2000. This is a 52.8 percent increase, an average annual growth rate of 2.4 percent.

Emery-Moore - The population is projected to be 491 in 1987, 525 in 1990, 554 in 1995, and 540 in 2000. This is a 36 percent increase, an average annual growth rate of 1.6 percent.

Price-Helper-Wellington - The population is projected to be 23,355 in 1987, 24,529 in 1990, 25,993 in 1995, and 26,453 in 2000. This is a 44 percent increase, an average annual growth rate of 2 percent.

#### IV. ENVIRONMENTAL CONSEQUENCES

##### A. Proposed Action

##### 1. Impacts

##### a. Air Quality

Particulates are the only pollutants which might significantly degrade air quality as a result of the proposed action. Increased emission of other pollutants, such as nitrogen oxides, sulfur oxides, carbon monoxide and photochemical oxidants would occur from vehicular traffic and sources associated with population growth, but the impact from the proposed action alone is expected to be small.

Particulate emissions from various mining activities were estimated using available emission factors (Pedco, 1978). It is estimated that approximately 750 tons per year of particulates would be emitted (480 tons from unpaved haul and access roads and 270 tons from mining activities) during strip mining. Approximately 405 tons of particulates per year would be emitted while underground mining occurs (385 tons from the unpaved haul and access road and 20 tons from transfer and storage sources). Fifty percent control of dust was assumed from watering of unpaved haul roads within the tract (which would be the minimum amount of control required under OSM regulations). Sources which would emit greater than 250 tons per year of any pollutant are presently subject to PSD permit review by EPA. Emissions from strip mining operations consist mainly of coal and soil particles.

No modeling was performed to estimate increases in pollutant concentrations. Because of the large size of the particulates that would be emitted from the mine and unpaved roads, most would settle out and be deposited on the ground within 1 mile or less downwind. Based on other studies, it is expected that annual average TSP increased concentrations would be below the 19 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) Class II increment. However, maximum 24-hour average concentrations could approach or exceed the Class II increment of  $37 \mu\text{g}/\text{m}^3$  in the immediate vicinity of the tract and any unpaved roads.

Some visibility reduction and atmospheric discoloration would occur in the immediate vicinity of the mine and associated haul and access roads as a result of particulate emissions.

The nearest Class I area is Capitol Reef National park about 20 miles south of the tract. Considering the distance from the tract to Capitol Reef and the rapid fallout of particulates with distance from the mine and unpaved roads, impacts to air quality and air quality related values (including visibility) would be expected to be extremely small at Capitol Reef.

The coal from this tract has the lowest Btu content, highest ash and highest sulfur content of all the tracts studied. If burned in powerplants, this would lead to higher levels of TSP and SO<sub>2</sub> emissions to achieve a given emission rate, increased emission controls and, subsequently, increased costs of pollution control equipment would be needed.

b. Topography, Geology and Paleontology

The mining operation will change natural contour of the tract at the rate of 50 acres per year. By 1990, 100 acres will be disturbed, 350 acres by 1995 and 1,000 acres by the end of the operation. Drainage patterns would probably be changed to a minor extent. An additional 78 acres would be disturbed by mining related activities. Reclamation will begin 5 years after mining commences and will be done at the rate of 40 acres per year. The recontoured land would not be steep enough to cause landslides; however, until revegetation takes place, a potential for erosion which could result in rills and gullies.

Subsidence up to 90 percent of the thickness of the coal mined could occur on most of the 1,560 acres of the tract, and is affected by several variables including (1) mining methods, (2) overburden thickness, (3) extraction amount and rate, and (4) geometry of mine workings. Tension cracks occur above barrier pillars a few months after mining, while compression bulges are formed on the surface approximately 1.5 to 2 years after mining. Also, additional tension cracks may occur as the surface subsides several years after mining completion (U.S. Department of the Interior, 1979). However, Consolidation Coal Company's Emery Mine has experienced few problems with subsidence using the room and pillar method in the same coal field (BLM, 1979).

An unknown number of invertebrate, vertebrate, and plant fossils could be destroyed as the result of mining activities. However, discovery and preservation of fossils exposed by mining which otherwise would remain undiscovered could occur. Due to the lack of data on location of paleontological sites and the scientific or educational value of fossils, the extent of the impact cannot be determined.

c. Minerals

At a 85 percent recovery rate, 15 percent (2,381,000 tons) of coal in the surface minable seams and 60 percent (16,230,000 tons) of coal in the underground minable seams at a 40 percent recovery rate would be lost as would any coal in seams which are not presently considered to be economically minable.

Petroleum and uranium exploration could conflict with coal mining as could any oil and gas production and uranium mining. Since potential for either commodity is moderate, any impacts should be relatively minor and would exist only for the duration of the operation for the area to be mined by surface mining methods.

d. Soils

By the end of mine life, an estimated 1,073 acres would be disturbed as a result of strip mining operations. This disturbance would involve the removal of large amounts of soil, stockpiling, and redistribution of the soil material. Loss of the natural soil integrity and the creation of new soil complexes would result. This action would alter the soil horization and structure, which would, in turn, affect the permeability, infiltration rates, chemistry, available water holding capacity, microclimates, soil microbiology and erosion potential. All of these factors would have a direct affect on loss of soil productivity and reconstruction potential. Observation of the detailed soil maps in the Carbon-Emery Report illustrates that a sizeable percentage of the 1,073 acres do not have identified soil resources on them, i.e., rock outcrop, rock land, badland, etc. The majority of soil resources that would be affected are very shallow (less than 20 inches) and unproductive. However, an estimated 110 acres of agricultural land would be taken out of production. Underground operations using vent shafts would add an additional 5 acres to the already disturbed 1,073 acres.

An estimated 50 acres of land would be disturbed each year when actual mining begins in 1989. Temporary loss of soil productivity would result. The cumulative acreage disturbed for the window years of 1990 and 1995 would be 173 and 432 acres, respectively. Reclamation of this land is scheduled to begin in 1990. An estimated 20 acres plus vent shafts would not be reclaimed until after the end of mine life. Starting in 1987, an additional 24 acres of land offsite would be disturbed because of access roads, and an additional 7 acres for powerlines and telephone lines. Secondary impacts of acreage lost to new housing and related development is expected to be 118 acres. Soil production would be lost where all permanent structures occur on areas that would not be reclaimed.

All soils affected by the strip mining activities have a poor to fair rating for soil reconstruction material. Materials rated as poor have indications that revegetation and stabilization would be very difficult and costly. The total volume of available topsoil on the tract appears to lack the minimum 30 inches recommended by the EMRIA report. Top dressing with better material would be necessary to establish and maintain vegetation. This would create an additional offsite surface disruption due to the increased number of borrow pits required to supply topsoil.

Estimated cost for the restoration of 18 inches of topsoil (EMRIA Study) would range from \$3,500 per acre to \$7,000 per acre. The fractional breakdown of these cost estimates are found in the EMRIA Report #16, page 240.

Onsite erosion rates from water could be expected to increase 6 to 10 times the present rate of 0.21 to 2.24 tons per acre per year if strip mining occurs. Quantification for soil loss by wind was not undertaken because of the unpredictability of wind occurrence and velocity. However, the sandy loam textures found dominately throughout the tract have a high susceptibility to wind erosion. This process would be accelerated until final seedbedding takes place. However, estimated losses for wind erosion can range from 65 to 117 tons per acre per year (I value soil erodibility index for wind).

Long-term storage of the topsoil may also lead to biological "death" of microorganisms necessary to soil nutrients. Increased infiltration of space and topsoil banks may lead to mass wasting of topsoil or space which may decrease air quality as well as increasing sediment loading of streams.

e. Water

The coal to be mined is within the Ferron Sandstone Member of the Mancos Shale. The Ferron Sandstone, a municipal aquifer that supplies potable water to the town of Emery and local individuals, would be disturbed by both strip and underground mining. The presence of mine and equipment on and in the aquifer would raise the pollution potential for the aquifer. The surface drainage would be disrupted by strip mining. Since the tract is on both sides of Muddy Creek, mining operations would impact it. Operations would require creek crossing, possible flow diversion, and mining below the creek bed which could cause seepage losses from the creek. These impacts would have sediment loading increases. Sediment yields might increase locally, but the amount of increase would depend on the time of construction, location, extent of areas disturbed, type of mitigation and weather conditions during mining.

The proposed coal tract is located in the groundwater discharge area along the Muddy. The proposed method of strip mining to a depth of 200 feet would put the mining operation below the streambed and into the zone of groundwater. It is likely that water problems would confront the mining operations. Flooding by released groundwater plus surface flooding should be under constant consideration because there are possibilities for these types of events. Mine drainage could be required and the mine water may be discharged to Muddy Creek, creating additional pollution. Substances which usually follow underground coal mining could create rock fractures through which shallow or perched aquifers might be drained. Should this occur, wildlife or livestock might have to find an alternative water source.

Obtaining the 73 to 123 acre-feet per year, (54 to 126 acre-feet for municipal use and 35-acre feet for mining) needed to implement the proposed action would cause a reduction in the water available to other users. The impacts of withdrawing 75 to 123-acre feet per year from Muddy Creek Drainage would have the impact of lessening the dilution effect of higher quality water upon the system (table 3.1). Thus, the water available for downstream uses will increase slightly in salinity.

f. Vegetation

The impact on vegetation from surface mining would be complete loss of existing plant communities on approximately 73 acres by 1987, 173 acres by 1990, 432 acres by 1995, and a maximum of 1,073 acres by the end of surface mining in 2008. Underground mining starting around 2009 would eliminate an additional 5 acres for ventilation shafts. The major vegetation loss would be in the Salt Desert Shrub type and would be approximately 460 acres. Three hundred twenty acres of the pinyon-juniper type, 310 acres of greasewood and 110 acres of agricultural land would be lost. Loss of vegetation would be in Sections 12, 13 and the S 1/2 of the SE 1/4 of Section 14.

TABLE 3.1  
PROJECTED WATER DATA OF THE EMERY NORTH TRACT

ITEM	1987		1990		1995		End of Surface Mine 2008		Start of Underground Mine 2009		End of Underground Mine 2029	
	Per Year	Cum.	Per Year	Cum.	Per Year	Cum.	Per Year	Cum.	Per Year	Cum.	Per Year	Cum.
Mining Water Use ac/ft/yr	35	35	35	140	35	315	35	770	30	800	30	1370
Population Increase	241		438		516		561		Same as 2008			
Required Increase in Culinary Water Supply	54		98		116		126		Same as 2008			
Required Increase in Sewage	16		29		35		38		Same as 2008			
Consumptive Use of Water by Increased Population	73		104		116		123		Same as 2008			

(Initial Use and Mining Less Sewage Effluent)

Offsite vegetation loss by 1987 from support facilities such as access roads, powerlines and telephone lines would be approximately 31 acres. No additional vegetation loss from offsite facilities would occur after 1987. The magnitude of the impacts from these offsite facilities depends on specific locations, which were not available. Given the extent and sensitivity of the present vegetation and the severity of the climate, it is probable that the post mining environment would not be suitable for plant growth without significant long-term support for transplanted and seeded shrubs and grasses.

Sclerocactus wrightiae, officially listed as endangered, has been found in Section 14, and other threatened and endangered plants may be in Sections 12 and 13. Surface mining of these sections could destroy this cactus and its habitat within the mining area.

g. Wildlife

The proposed action would have an influence on all of the 2,201 acres of onsite wildlife habitat during some period of the 40-year mine life.

The removal of coal through strip mining procedures and the development of both onsite and offsite facilities would physically destroy 1,109 acres of low quality wildlife habitat before the mining operation is completed. The loss of 2,201 acres (1,109 through strip mining and 1,092 for human influence and occupancy) of habitat would reduce the carrying capacity of the range by 2.2 deer.

Strip mining activities along Muddy Creek would destroy riparian habitat which is important for use by deer, small mammals, raptors, songbirds and ducks. All riparian habitat areas are important in a semi-desert area. Any disturbance of the stream channel would degrade water quality by increasing sediment loads. This could result in reduced nongame fish populations in Muddy Creek below the proposed tract. The increased sediment and salt load could also have a negative impact on the fish species in the Colorado River. The losses to fish and wildlife resulting from the destruction of the riparian zone and stream channel along Muddy Creek cannot be quantified.

The number of small and medium-sized wildlife species that would be lost or displaced cannot be quantified. Offsite losses to these species will result from increased truck and vehicle traffic. When considering the widespread occurrence of these species and the availability of suitability habitat, losses resulting both on the tract and offsite should not be significant.

There would be some offsite losses to deer and raptors resulting from coal being transported on I-70 to Salina, Utah. Most of these losses would occur during the five month winter period. It's been estimated that 2 deer per month, or 10 deer per year, would be killed by the increased truck traffic. Over the 40 year mine life, this would result in a direct loss of 400 deer. The increased truck traffic along U-10 and I-70 would result in an undetermined loss of raptors.

The impacts which could occur to birds of high Federal interest are not known. However, because the use of this tract by any of the species listed under Criteria 14 would be considered as incidental and because the tract does not meet the criteria for classification as high priority habitat, there should not be any impacts to these species (F&WS, 1979).

#### h. Cultural Resources

Of the 37 known (and up to 150 estimated) cultural sites, all but three appear to be located on potential impact areas of strip mining. Again, however, this is a mere approximation and the precise impact areas would need to be inventoried to identify all sites, known and unknown, which might be impacted by proposed developments. Construction of access roads, core drill sites, plant facilities, powerlines and stripping of coal could destroy or these sites resulting in irreparable loss of scientific and educational information which is of unknown recreational potential. Most or all sites may require some degree of salvage excavation or other data recovery resulting in a loss of context of the artifacts and any data currently unrecoverable with existing techniques.

#### i. Visual Resources

The proposed action, excluding the off site facility development, would conflict with the management guidelines for Class II and III. Severe disruption to the existing landform would occur on a short-term and long-term basis. The area which is Class II is visible from I-70. Approximately 50 acres per year would be affected each year by actual mining. See table 3.2 for a time point analysis of the visual impacts. The facilities offsite would not significantly affect the visual resources since these would be in keeping with the present development in the Emery area.

#### j. Recreation

Access to public lands and the National Register Site on the mesa top would be restricted by the proposed action. Displacement of recreation visitors would be of minimal impact. The surrounding country offers comparable values and experiences. Increased recreational demand as a result of the anticipated employment would not result in a significant change to the dispersed nature of recreation in Emery County. Demand for urban recreation facilities (city parks, swimming pool, tennis courts) is expected to increase slightly in the larger communities.

#### k. Land Uses

Mining of the Emery North Tract would eliminate livestock grazing on approximately 1,073 acres of public land. This would amount to a loss of approximately 34 AUMs by the year 2000 all from the Lone Tree Allotment. This would be a 1 percent loss of AUMs from the total of 2,750 AUMs in that allotment. The 31 AUMs lost to offsite facilities would have negligible impact on livestock use.

There may be conflicts between oil and gas and coal resources if exploration and development are not closely coordinated by GS and various lessees. It is anticipated that there would not be any impacts to the existing rights-of-way, since coal management regulations require the coal lessee to maintain the integrity of the existing rights-of-way, either by avoiding them or having them moved.

**TABLE 3.2**  
**Time Point Analysis for Visual Impacts**

	1987	1990	1995	End of Surface Mine Life 2008	Start of Underground Mine 2028	End of Underground Mine 2034	Final Reclamation 2034
<b>VRM</b>							
Mining Operations	Moderate	Severe	Severe	Severe	Severe	Severe	Moderate
Facilities On Site & Coal Storage	Minimal	Moderate	Moderate	Moderate	Moderate	Moderate	Minimal
Facilities Off Site <sup>a</sup>	Minimal	Minimal	Minimal	Minimal	Minimal	Minimal	Minimal
<b>RECREATION</b>							
Mining Operations	Minimal	Minimal	Minimal	Minimal	None	None	None
Facilities On Site & Coal Storage	Minimal	Moderate	Moderate	Moderate	Moderate	None	None
Facilities Off Site <sup>a</sup>	None	None	None	None	None	None	None

<sup>a</sup> Access Road, Powerline, Telephone Line

## 1. Transportation and Noise

Before A.D. 2000, surface mining would be taking place on the property, which would add 83 truckloads of coal per day (166 vehicles per day) to the anticipated traffic base. Workers at the mine would add about 108 vpd in auto and light truck passages. About 22 vpd would result from servicing the needs of the mine which would total about 400 vpd on the access road.

At U-10, this anticipated traffic would divide, depending on its destinations. If the coal were to be trucked to points north, about 242 vpd would go northward, 54 vpd south and west. If the coal were to be trucked to Salina, 76 vpd would go north and about 220 vpd to the south and west.

Service truck traffic from Price and coal truck traffic, if it goes northward, would tend to make a bad traffic situation worse if U-10 is not made into a four-lane highway before the mine traffic began to use it. Coal truck traffic would be an irritant in the smaller towns, both from the standpoint of noise and from interference with other traffic and pedestrians. Hauling coal to Mohrland near the south end of the crowded length of road would cause annual average daily traffic (AADT) to exceed 6,000 vpd in the vicinity of Huntington, a figure UDOT considers to be a warning sign of traffic overloads based on 1978 AADT without projections to 1990.

If coal were to go westward along I-70 into Salina, additional traffic would add 10 percent to 1978 traffic along this road, which carries a comparatively light load for a four-lane interstate highway. Commuter traffic to and from the mine would presently use underutilized sections of U-10 with small impact. Through most of rural Utah, traffic accidents increase generally in proportion to traffic volume.

On the average, diesel trucks that would be hauling coal produce about 95 decibels, "A" scale (dBA) traveling at road speeds measured 50 feet away. A 40 percent increase in sound intensity from 95 dBA to about 98 dBA would result when two such trucks pass each other.

### m. Social Economics

The total population increase resulting from the Proposed Action is projected to be 241 people in 1987, 438 in 1990, 516 in 1995, and 516 in 2000. Growth would mainly occur in the Ferron-Clawson (54 percent), the Emery-Moore (27 percent) areas of Emery County, and the Price-Helper-Wellington area (11 percent) of Carbon County.

The remaining growth would be spread among several other communities in Carbon, Emery, Sanpete, and Sevier Counties. Of these, no single community would receive a sufficient population increase to cause significant impacts.

Ferron-Clawson - The greatest growth of population (54 percent) would occur in this area. The population increase would be 130 people in 1987, 232 in 1990, 268 in 1995, and 284 in 2000. The baseline population projection for the same years in the area are 2,179, 2,251, 2,319, and 2,257 respectively. The projected growth represents a 6 percent increase over the baseline in 1987, 10 percent in 1990, 12 percent in 1995, and 13 percent in 2000, and when combined with the baseline, represents a 72 percent increase in year 2000 over the present (1978) level of 1,480. These population increases would increase the average annual growth rate from 2.4 percent to 3.3 percent.

Emery-Moore - Approximately 27 percent of the population growth associated with the PA would occur in this area. The population increase would be 67 people in 1987, 117 in 1990, 134 in 1995, and 141 in 2000. The baseline population projections for the same years are 491, 525, 554, and 540 respectively. The projected growth represents a 14 percent increase over the baseline in 1987, 22 percent in 1990, 24 percent in 1995, and 26 percent in 2000, and when combined with the baseline, represents a 71 percent increase in year 2000 over the present (1978) level of 393. These population increases would increase the average annual growth rate from 1.6 percent to 3.3 percent.

Price-Helper-Wellington - Approximately 11 percent of the population growth attributable to the PA would occur in this area. The population increase would be 24 people in 1987, 48 in 1990, 59 in 1995, and 71 in 2000. The baseline population projections for the same years are 23,355, 24,529, 25,993, and 26,453, respectively. The projected growth represents a .1 percent increase over the baseline in 1987, .1 percent in 1990, .2 percent in 1995, and .2 percent in 2000, and when combined with the baseline represents a 44 percent increase in year 2000 over the present (1978) level of 18,400. These population increases would increase the average annual growth rate from 1.9 percent to 2 percent.

## 2. Mitigating Measures

### a. Air Quality

The Central Utah Coal ES (USGS, 1979) stated "...each mining plan and the Department's approval thereof shall use at a minimum, an appropriate combination of the following fugitive dust controls:"

- Pavement or equivalent stabilization of all haul roads used or in place for more than 1 year;
- Treatment with semipermanent dust suppressant of all haul roads used or in place for less than 1 year or for more than 2 months;
- Watering of all other roads in advance of and during use whenever sufficient unstabilized material is present to cause excessive fugitive dust;
- Reduction of fugitive dust at all coal dumps and truck to crusher locations through use of negative-pressure bag house or equivalent methods. Inclusion of conveyor and transfer point covering and spraying and the use of coal loadout silos.

In the above measures, the term haul road should be interpreted to include roads used for haulage of coal and major mine access roads. Bussing of employees to and from work would result in less impact to air quality and visibility than allowing workers to drive their own cars.

**b. Topography, Geology and Paleontology**

Disturbed area should be graded to the natural contour and revegetated as required by OSM regulations. BLM should be notified upon the discovery of a significant paleontological site and the site should be salvaged prior to any further mining activity.

**c. Minerals**

Any exploration conducted by a uranium or petroleum company would require coordination between the exploring company and the coal company.

**d. Soils**

The information and recommendations in the EMRIA Report should be utilized as a model for soil reclamation and revegetation. Some of the more critical reclamation measures that apply to this tract are:

- Initially, at least 6 inches of topsoil must be removed over the pit and stockpiled;
- Topsoil to qualify for stockpiling must have an exchangeable sodium ratio (SAR) less than 15 (clay ratio less than 40 percent) and be 6 inches or greater in depth;
- Stockpiled topsoil must be protected from wind and water erosion;
- Overburden must be tested a minimum of twice annually to determine the presence of adverse contaminants. All overburden materials deemed suitable should be mapped and graded according to their ability to support plant growth.
- The timing and treatment of stockpiled soil and surface treatment as recommended in the EMRIA Report (pages 242 to 248) should be utilized to insure minimum adverse impacts.

**e. Water**

It is essential that mining operations be kept out of the floodplain. Flood flows of around 4,590 CFS coming down the channel are definitely high hazards to human life and mining equipment. Besides, there are EO's (Floodplain Management and Wetland Management) requiring this area to be protected. Since some of the area of the strip mining will be below the depth of the streambed, any accidental blockage of the channel could divert the whole flood into the pit if precautions are not taken. Mitigation measures of a 300 foot buffer zone beyond the floodplain on both sides of Muddy Creek is advisable.

To keep sediment loads to a minimum, stream crossing should be localized to a few spots. Bridges should be constructed as a minimum high quality crossing. All equipment should be kept out of the Muddy Creek channel. Additional contouring of the stripped area's overburden and restructuring of surface drainage will also reduce sediment loading.

Since the operations will be conducted on a municipal aquifer, all sanitation facilities should be self contained and disposed of away from the aquifer by way of legal methods. Practices to prevent spillage of fuel oils and other contaminants in the area should be implemented.

#### f. Vegetation

It is recommended that mined and disturbed areas be seeded to as many native species as possible with the addition of introduced species that have proven successful locally to return the vegetation to the original level of productivity or better than that which was existing before mining. Refer to EMRIA Report No. 16, page 242-248 for a detailed description of reclamation measures. Reclamation of the mined area should support the existing levels of livestock grazing, wildlife habitat and vegetative covering. be seeded to as many native species as possible with the addition of introduced species that have proven successful locally. To return the vegetation to the original level of productivity or better than that which was existing before mining, refer to EMRIA Report No. 16, pages 242-248 for a detailed description of reclamation measures. Reclamation of the mined area should support the existing levels of livestock grazing, wildlife habitat, and vegetation cover.

Before any surface disturbance is initiated, an onsite survey to determine the exact location of the T/E species would be required.

Proposed leasing and disturbance of a known T/E species or its habitat would require formal consultation with the Fish and Wildlife Service and a decision from the Endangered Species Committee. Pending the results of consultation and a site specific survey, certain identified underground mining areas could possibly be leased with no surface occupancy.

#### g. Wildlife

The loss of habitat for deer and other small and medium-sized wildlife species on the tract could be mitigated by requiring the company to revegetate 1,078 acres of disturbed area. However, reclamation efforts will maintain the quality of wildlife habitat that existed before mining. A seed mix that would produce a species composition of one-third grass, one-third forb and one-third browse would be most desirable for wildlife. Reclamation efforts should start no later than 2 years following the disturbance of the surface area involved. Attempts at revegetation should be required until a successful vegetation composition has become established on the disturbed areas.

Prior to any surface disturbance there should be an on the ground investigation of the tract to ensure that important habitat for birds of high Federal interest (Criteria No. 14) will not be destroyed.

To minimize negative impacts to duck, songbird, deer and fisheries habitat, the stream channels and adjacent riparian vegetation along Muddy Creek should not be disturbed for a distance of 300 feet on each side of the stream.

#### h. Cultural Resources

Some potential impacts to cultural sites may be avoided by moving or adjusting the location of surface facilities. This would preserve the sites and data in place and is most preferable and economical. Where impacts are unavoidable (such as in strip mining), salvage of significant sites would be necessary. To determine the appropriate course of action, the lessee would be required to provide a qualified archaeologist approved by BLM's authorized officer. This archaeologist would intensively survey impact areas prior to any surface disturbance and propose needed mitigation. Based on the archaeologist's recommendations, BLM would develop a mitigation plan after consultation with the State Historic Preservation Office and the Advisory Council on Historic Preservation. The lessee would then be required to comply with that plan before construction could proceed.

It is recommended that the 40 acre area designated as a National Register of Historic Sites locale (42Em392 along Muddy Creek) be withheld from leasing. This coincides with the MFP recommendation that the National Register site is unsuitable for coal leasing under unsuitability criteria number 7.

#### i. Visual Resources

The proposed strip mining should leave the escarpment undisturbed, so that the coal cliff line of the Molen Reef on the east, southeast portion of the tract would be natural as viewed from the Rochester-Muddy National Register Site and I-70.

#### j. Recreation

No mitigating measures are needed as dispersed recreation will naturally adjust to adjacent areas and urban recreation demands will be met of other energy and support programs. As discussed in the preceding VRM section, an additional 20 acres should be added to the existing National Register property to protect the scenic and scientific value of this unique rock art panel.

k. Land Uses

Unmined areas within the tract should be left available for livestock grazing, so far as safety to the animals is maintained. Early coordination between oil and gas and coal lessees and the GS, would be required to facilitate development of these resources.

1. Transportation and Noise

Watering or paving of the access road would be required to reduce dust and improve safety conditions.

All motorized equipment must be muffled to produce not more than 80 dBA at 35 mph under acceleration measured at a distance of 50 feet.

3. Residual Unavoidable Adverse Impacts

a. Air Quality

The mitigating measures listed for fugitive dust control would reduce particulate emissions by a substantial amount, although unquantifiable at this time. Emissions resulting from population growth would not be altered by the mitigating measures.

b. Topography, Geology and Paleontology

The topography and local drainage patterns will be changed as the result of the mining. The Ferron Sandstone would be completely disrupted by the mining. Mining the coal would destroy an undetermined amount of floral, vertebrate and invertebrate fossils.

c. Minerals

Coal in seams which cannot be economically mined and 18,611,000 tons of coal which are unrecoverable, would be lost. Exploration for uranium and petroleum on the tract would be difficult while mining is taking place on 375 acres being surface mined.

d. Soils

There would be a loss of the soils morphology on 1,930 acres, i.e., soil horization, structure, alteration of the permeability and infiltration rates, as well as the available water holding capacity, soil microbiology and microclimates. Soil development is a very slow process and with the semiarid climate, this process is significantly slower. Thus, the restoration or duplication of the original soil may take thousands of years or may be irretrievable. With reclamation and additional topsoil being brought in, the productivity may increase. All of these factors are directly related to reconstruction-revegetation potential. There would also be a loss of soil productivity on all sites with permanent structures.

e. Water

Mining would divert 73 to 123-acre feet of water per year for the life of the tract. Changes in water quality would be increased sediment loading which would vary with the mining operation and climatic conditions. Surface expression of water would be changed if subsidence occurred.

f. Vegetation

Possible loss of 1,073 acres of existing plant communities for a period of 5 to 50 years.

Possible loss of plants and habitat for one endangered plant, Sclerocactus wrightiae. The final decision would come from the Endangered Species Committee.

g. Wildlife

Twenty-five acres of access road, powerline and telephone line rights-of-way would not be revegetated, resulting in a permanent loss of wildlife habitat.

h. Cultural Resources

Some unknown or surficially undetectable (i.e. buried) cultural resources may be damaged by construction of various facilities. Context of artifacts and data currently unrecoverable using existing techniques would be lost also. Exposure of the Rochester-Muddy Petroglyphs as an isolated unmined area would increase visitation and possible vandalism or destruction by rock art collectors. However, this would be mitigated somewhat if the petroglyph area was only part of a larger unmined strip along Muddy Creek.

i. Visual Resources

Modification of the natural landform would occur with significant impacts on the Class III area. The resulting landform would be noticeable as an unnatural intrusion since rehabilitation to the original visual character is unlikely.

j. Recreation

Displacement of dispersed recreation use patterns would occur into adjacent areas.

k. Land Uses

Loss of 34 AUMs for livestock grazing at a rate of approximately 2.0 AUMs per year to end of mine life, and then 5 to 20 years longer for reclamation.

l. Transportation and Noise

Most of the impacts of increased traffic would occur on U-10 from Price southward, decreasing southward to the vicinity of Castle Dale.

#### 4. Short-Term Use and Long-term Productivity

The topography of the tract will be altered at the rate of 50 acres per year due to the mining. In 1987, 73 acres would have been disturbed due to road construction and other activities. Mining would have disturbed 100 acres in 1990, 350 acres in 1995 and 1,000 acres by the end of the operation. Reclamation would be scheduled to be done at the rate of 40 acres per year, with 203 acres restored by 1995. The rest of the tract would be reclaimed with 5 years after cessation of mining. Any paleontological sites discovered and salvaged now would not be excavated in the future when recovery and analysis techniques and research orientation may be improved, but collection of fossils now could contribute to present knowledge.

The extraction of the coal would be an immediate commitment of the resource of which 24,389,000 tons of 43,000,000 tons of coal would be recoverable, while the remaining is not. Conflicts between exploration for petroleum and uranium, and coal mining could occur during the life of the operation.

Short-term soil and vegetative productivity would be lost on 1,073 acres from mine site development due to the proposed action. Revegetation of the disturbed areas would be required, and productivity would be regained over time following successful reclamation. Long-term productivity would also be lost on soils due to housing and related development and increased borrow activities. Habitat for Sclerocactus wrightiae could be lost.

After mining ceases on the tract and the land is reclaimed, water production should be about the same as it was before mining. If the increased population due to mining remained, then, of course, use would continue and the pollution potential for the Muddy Creek drainage would remain.

There would be a temporary reduction in deer, raptors and small and medium-sized wildlife species on and off the tract while the mine is in operation and until vegetation becomes reestablished after the mine life has expired. The loss of habitat (2,201 acres) would reduce the capability of the range to support 2.2 deer and 60 deer over the life of the mine. The long-term productivity for all wildlife species should be equal to present levels on the tract approximately 15 to 20 years after the life of the mine. After this period of time, a variety of grasses, forbs, trees and shrubs should have become reestablished. Habitats for most species of wildlife should be restored.

Cultural sites thought now unimportant may later be recognized as significant. Any prehistoric sites salvaged now could not be excavated later with better data recovery and analysis techniques and improved research orientations. However, materials collected and analyzed now would contribute to improved understanding of the area's cultural resources and thus contribute to future research.

Short term use of the area for coal mining would not meet the existing visual resource management classes. Restoration of the area after mining would meet the Class II objectives, but would not meet the Class II and III visual resource management objectives on those existing classified areas. Dispersed recreation will gradually return after the area is reclaimed.

Over the short term, a loss of 34 AUMs per year would occur. Long term grazing capacity would be restored to existing levels or better.

5. Irreversible and/or Irretrievable Commitment of Resources

Termination of coal mining would lead to a termination of pollutant emissions. Thus, the air resource would not be irreversibly committed as a result of mining. Emissions from secondary growth and related activity such as traffic, urban fuel consumption, etc., induced by the proposed action would be more permanent and result in a long-term commitment of the air resource to some deterioration.

Some changes in topography and drainage would occur, but the changes are not expected to be extensive. An unknown number of plant, vertebrate and invertebrate fossils would be displaced, damaged or destroyed.

Leasing this tract would irretrievably commit 24,389,000 tons of coal to be mined, with the remaining 18,611,000 tons being lost.

Addressing the productivity standpoint, there would be no irreversible or irretrievable impacts on the soil resources providing successful reclamation.

Interruption of the Ferron Sandstone aquifer would be irreversible. Drainage patterns into Muddy Creek could be permanently altered.

Strip mining of T/E habitat would eliminate the particular T/E plants from the tract permanently.

The proposed development would result in a loss of habitat quality and productivity (carrying capacity capabilities) for deer and other wildlife species for the entire mine life plus 20 to 40 years. The loss of deer during the mine life are irretrievable. All loss of deer and raptors resulting from truck and vehicle traffic during the mine life are irretrievable.

The number of small and medium-sized wildlife species that will be lost or displaced cannot be quantified.

Any cultural site information damaged or lost during salvage excavations due to current methodological inadequacies would be irreversibly and irretrievably destroyed. Rochester-Muddy Petroglyphs would suffer irreversible change in their surroundings, which would alter their quality and the quality of the viewing experience significantly. This would be partially mitigated by leaving a strip unmined along the length of Muddy Creek; temporary impairment is certain.

Cumulative loss of 850 to 1,530 AUMs to the livestock operators over the life of the mine.

1 (265981)

## 6. Net Energy Balance

The new CEQ regulations (November 1979) require that a net energy analysis be discussed indicating the energy requirements of an action compared to the anticipated energy yields. The accompanying Net Energy Summary Sheet (table 4.1) estimates the amount of energy in the coal produced, the energy expended in its production, and the energy left in the ground as not being economically recoverable.

The energy input shown, as needed for "Production and Transportation" includes all energy required to produce the coal and transport it to a rail shipping point. This comprises fuel used directly or as electricity for mine production, truck transportation of coal and transportation of personnel and supplies -- the energy used for manufacturing the mining and transportation equipment and for constructing facilities -- the energy used for manufacturing supplies -- the petroleum used in hydraulic fluids, lubricants, and explosives -- and hydrocarbon in feedstocks used in supply manufacture.

The energy input shown as required for "infrastructure" includes the energy consumed as electricity, natural gas, heating oil, and gasoline by mine employees and families, by the similar number of service employees who support, and by a proportionate number of commercial establishments.

Rail shipment of coal requires about 600 btu's per ton/mile in the form of direct energy. A similar amount is consumed indirectly and by associated infrastructure. About one-half percent of the energy in coal is required to transport it 100 miles by rail.

Energy consumption is considered as beginning for electricity with coal deliveries to the generating station -- for petroleum products with deliveries to area supplies -- and for natural gas with deliveries to consumers.

Net energy analyses made for tracts in the Hams Fork-Green River Region included full allowances for unrecovered resources in the deposits from which energy minerals would be supplied to the proposed sale tracts. These allowances were not included in this analysis. This item appears useful only in the tract being considered for lease sale. In any case, the item is meaningless without evidence as to the ultimate recovery of coal, oil, and gas both with and without the lease sale. Allowances for unrecovered coal in the mines (which are all underground), that would supply electricity to the tract would be equal to the coal burned. Allowances for unrecovered oil and natural gas is considered to be about 2.2 times that recovered (verbal communication from Albert G. Melcher, Project Manager, Energy Division, Colorado School of Mines Research Institute).

**TABLE 4.1**  
**NET ENERGY SUMMARY SHEET**

**SITE:** Emery North

**BLM:** Utah

	<u>Surface Mining Period</u>		<u>Underground Mining Period</u>		<u>Total Life-of-Mine</u>
	<u>Annual</u>	<u>Total Period 20 Yr.</u>	<u>Annual</u>	<u>Total Period 20 Yr.</u>	<u>Total Mine Life 40 Yrs.</u>
1. Energy Output Btu's	13,640	272,800	10,880	217,600	490,000
2. Energy Input Direct & Indirect Btu's	840	16,800	509	10,180	26,980
3. Unrecovered Resource Btu's		47,890		326,220	374,110
<b>2.1 Production/Transp.</b>					
Petroleum	285	5,700	104	2,080	7,780
Natural Gas	58	1,160	43	860	2,020
Coal	359	7,180	172	3,440	10,620
Hydro Power	---	---	---	---	---
Nuclear	---	---	---	---	---
Other	---	---	---	---	---
<b>Total</b>	<b>702</b>	<b>14,040</b>	<b>319</b>	<b>6,380</b>	<b>20,420</b>
<b>Ratio Output/Input</b>		<b>19.4</b>		<b>34.1</b>	<b>27.3</b>
<b>2.2 Infrastructure</b>					
Petroleum	53	1,060	73	1,460	2,520
Natural Gas	44	880	60	1,200	2,080
Coal	41	820	57	1,140	1,960
Hydro Power	---	---	---	---	---
Nuclear	---	---	---	---	---
Other	---	---	---	---	---
<b>Total</b>	<b>138</b>	<b>2,760</b>	<b>190</b>	<b>3,800</b>	<b>6,560</b>
<b>Ratio Output/Input</b>		<b>98.8</b>		<b>57.3</b>	<b>74.8</b>
<b>2.3 Total 2.1 + 2.2</b>					
Petroleum	338	6,760	177	3,540	10,300
Natural Gas	102	2,040	103	2,060	4,100
Coal	400	8,000	229	4,580	12,580
Hydro Power	---	---	---	---	---
Nuclear	---	---	---	---	---
Other	---	---	---	---	---
<b>Total</b>	<b>840</b>	<b>16,800</b>	<b>509</b>	<b>10,180</b>	<b>26,980</b>
<b>Ratio Output/Input</b>		<b>16.2</b>		<b>21.4</b>	<b>18.2</b>

V. CONSULTATION AND COORDINATION

Dykman, James, Utah State Historic Preservation Office (USHPO).

United States Fish and Wildlife Service (USF&WS) (Clark Johnson) was contacted for information pertaining to threatened and endangered species and migratory birds (Criteria No. 14).

Utah Department of Transportation, Transportation Planning Division.

Utah Division of Wildlife Resources (UDWR), (Larry Dalton), Southeastern Regional Office was contacted for input into the wildlife section of the environmental analysis.

Weed, Carol, Project Supervisor, 1981 Coal Leasing Cultural Inventory, New World Research, Pollack, Louisiana.

## APPENDIX I

Salt Desert Shrub Community

<i>Atriplex confertifolia</i>	<i>Eriogonum corymbosum</i>
<i>Xanthocephalum sarothrae</i>	<i>Artemisia pygmaea</i>
<i>Ambrosia acanthicarpa</i>	<i>Cymopterus bulbosus</i>
<i>Artemisia bigelovii</i>	<i>Lepidium montanum</i>
<i>Eriogonum cernuum</i>	<i>Eriogonum hookeri</i>
<i>Astragalus asclepiadoides</i>	<i>Tetradymia spinosa</i>

Especially common on clay barrens are:

<i>Atriplex cuneata</i>	<i>Atriplex corrugata</i>
<i>Eriogonum inflatum</i>	<i>Eriogonum gordonii</i>
<i>Atriplex powellii</i>	<i>Camissonia scapoidea</i>
<i>Phacelia demissa</i>	<i>Cleomella palmerana</i>

Pinyon-Juniper Woodland Community

<i>Juniperus osteosperma</i>	<i>Opuntia polyacantha</i>
<i>Pinus edulis</i>	<i>Culanthus crassicaulis</i>
<i>Amelanchier utahensis</i>	<i>Yucca harrimaniae</i>
<i>Artemisia tridentata</i>	<i>Schoenocrambe linifolia</i>

Species especially common on rim rock and cliff systems:

<i>Cercocarpus intricatus</i>	<i>Thelypodopsis divaricata</i>
<i>Cercocarpus montanus</i>	<i>Astragalus desperatus</i>
<i>Cowania mexicana</i>	var. <i>petrophilus</i>
<i>Ephedra viridis</i>	<i>Cryptantha</i> spp.

Saline or Alkaline Moist Area Community

<i>Sarcobatus vermiculatus</i>	<i>Distichlis stricta</i>
<i>Juncus arcticus</i>	<i>Aster brachyactis</i>
<i>Salix exigua</i>	<i>Aster pauciflora</i>
<i>Scirpus maritimus</i>	<i>Chrysothamnus linifolius</i>
<i>Typha latifolia</i>	<i>Tamarix ramosissima</i>
<i>Suaeda</i> spp.	<i>Bassia hyssopifolia</i>
<i>Oxytenia acerosa</i>	<i>Polypogon monspeliense</i>

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## Emery North

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- Mining Information Services, 1976, Keystone Coal Industry Manual, McGraw-Hill Mining Publications, New York, New York.

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Robison, Steve, 1977, Paleontological Inventory of Existing Data for the Moab District, Bureau of Land Management, Utah State Office, Salt Lake City, Utah, December 20.

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United States Department of the Interior (USDI), Bureau of Land Management, Moab District, Utah, Cultural Computer File (1979) and various site forms were searched to assemble data for this analysis.

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Utah Division of Water Resources, 1977, "Hydrologic Inventory of the Dirty Devil Study Unit", Salt Lake City, Utah.



# United States Department of the Interior

## BUREAU OF LAND MANAGEMENT

Utah State Office  
P.O. Box 45155  
Salt Lake City, UT 84145-0155  
www.ut.blm.gov

*L. Bennett  
4/10/03  
JWP  
7/12/03  
88K  
7/13/03  
RST/mach  
7/13/2003*

IN REPLY REFER TO:  
3451 (UT-924)  
UTU-50044

**JUL 3 2003**

**CERTIFIED MAIL—Return Receipt Requested**

### DECISION

Consolidation Coal Company	:	Coal Lease
c/o CNX Land Resources Inc.	:	UTU-50044
Attn: Mr. Rod Ford	:	
1800 Washington Street <i>LEAD</i>	:	
Pittsburgh, PA 15241	:	

### Readjustment of Coal Lease UTU-50044 Effective July 1, 2003

The regulations under 43 CFR 3451.1(a)(1) and (2) state:

1. All leases issued after August 4, 1976, shall be subject to readjustment at the end of the first 20-year period and at the end of each 10-year period thereafter.
2. Any lease subject to readjustment, which contains a royalty rate less than the minimum royalty prescribed in 43 CFR 3473.3-2 shall be readjusted to conform to the minimum prescribed in that section.

Coal lease UTU-50044 was issued effective July 1, 1983. By notice dated July 3, 2001, Consolidation Coal Company was notified that the terms and conditions of the readjustment would be provided in accordance with the regulations under 43 CFR 3451 no later than July 1, 2003.

As provided in Section 23 of the lease and in accordance with the regulations under 43 CFR 3451.2, enclosed are the terms and conditions of coal lease UTU-50044 effective July 1, 2003.

The current lease bond of \$5,000 is considered adequate at this time. If production commences on the lease, the bond will be increased to cover royalty from three months production.

Coal lease UTU-50044 is part of the Moab I Logical Mining Unit (LMU) (sometimes referred to as Emery LMU). The terms and conditions of the LMU supersede, but do not suspend individual lease terms and conditions. The LMU has exhausted its number of allowed advance royalty payments, and must produce in commercial quantities by July 1, 2003, and every year hereafter, or it will fail. If the LMU fails, the individual Federal leases currently in the LMU will revert to their individual lease terms and conditions.

Coal lease UTU-50044 is hereby readjusted effective July 1, 2003, in accordance with the regulations at 43 CFR 3451.2. 2.

This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR, Part 4, and the enclosed Form 1842.1. If an appeal is taken, your notice of appeal must be filed in this office (at the above address) 30 days after receipt of this decision. The appellant has the burden of showing that the decision appealed from is in error.

If you wish to file a petition (pursuant to regulation 43 CFR 4.21)(58 FR 4939, January 19, 1993) (request) for a stay (suspension) of the effectiveness of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay must accompany your notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed below. Copies of the notice of appeal and petition for a stay must also be submitted to each party named in this decision and to the Interior Board of Land Appeals and to the appropriate Office of the Solicitor (see 43 CFR 4.413) at the same time the original documents are filed in this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

Standards for Obtaining a Stay

Except as otherwise provided by law or other pertinent regulation, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards.

- (1) The relative harm to the parties if the stay is granted or denied.
- (2) The likelihood of the appellant's success on the merits.
- (3) The likelihood of immediate and irreparable harm if the stay is not granted, and
- (4) Whether the public interest favors granting the stay.

*Kent Hoffman*  
 Kent Hoffman, Acting  
 Deputy State Director  
 Lands and Minerals

Enclosures

1. Form 1842-1 (1 p)
2. Coal Lease Readjustment (9 pp)

cc: Ms. Jill Ptacek, Department of Justice (w/encl.)  
 Resource Development Coordinating Committee (w/encl.)  
 Mr. Lowell Braxton, Director, UDOGM (w/encl.)  
 Price Coal Office (Attn: George Tetreault)(w/encl.)  
 MMS, MRM, Solid Minerals Staff (w/encl.)  
 Consolidation Coal Company, Attn: Seth McCourt, Box 527, Emery, UT 84522 (w/encl.)  
 CNX Land Resources Inc., Attn: Randy Stockdale, Box 639, Sesser, IL 62884 (w/encl.)

**UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT**

Serial Number UTU-50044

Lease Date July 1, 1983

**COAL LEASE READJUSTMENT**

**Part I. LEASE RIGHTS GRANTED**

This lease, entered into by and between the United States of America, hereinafter called the lessor, through the Bureau of Land Management, and

Consolidation Coal Company  
c/o CNX Land Resources Inc.  
Attn: Mr. Rod Ford  
1800 Washington Road  
Pittsburgh, PA 15241

hereinafter called lessee, is readjusted, effective July 1, 2003, for a period of 10 years and for so long thereafter as coal is produced in commercial quantities from the leased lands, subject to readjustment of lease terms at the end of each 10 year lease period.

**Sec. 1.** This lease readjustment is subject to the terms and provisions of the:

Mineral Lands Leasing Act of 1920, Act of February 25, 1920, as amended, 41 Stat. 437, 30 U.S.C. 181-287, hereinafter referred to as the Act;

Mineral Leasing Act for Acquired Lands, Act of August 7, 1947, 61 Stat. 913, 30 U.S.C. 351-359;

and to the regulations and formal orders of the Secretary of the Interior which are now or hereafter in force, when not inconsistent with the express and specific provisions herein.

**Sec. 2.** Lessor, in consideration of any rents and royalties to be paid, and the conditions and covenants to be observed as herein set forth, hereby grants to lessee the exclusive right and privilege to drill for, mine, extract, remove or otherwise process and dispose of the coal deposits in, upon, or under the following described lands:

T. 22 S., R. 6 E., SLM, UT  
Sec. 22, SWNW, N2SW, SESW.

containing 160.00 acres, more or less, together with the right to construct such works, buildings, plants, structures, equipment and appliances and right to use such on-lease rights-of-way which may be necessary and convenient in the exercise of the rights and privileges granted, subject to the conditions herein provided.

## PART II. TERMS AND CONDITIONS

**Sec. 1. (a) RENTAL RATE.** Lessee shall pay lessor rental annually and in advance for each acre or fraction thereof during the continuance of the lease at the rate of \$3.00 for each lease year.

**(b) RENTAL CREDITS.** Rental shall not be credited against either production or advance royalties for any year.

**Sec. 2.(a) PRODUCTION ROYALTIES.** The royalty shall be 12½ percent of the value of coal produced by strip or auger mining methods and 8 percent of the value of coal produced by underground mining methods. Royalties are due to lessor the final day of the months succeeding the calendar month in which the royalty obligation accrues.

**(b) ADVANCE ROYALTIES.** Upon request by the lessee, the authorized officer may accept for a total of not more than 10 years, the payment of advance royalties in lieu of continued operation, consistent with the regulations. The advance royalty shall be based on a percent of the value of a minimum number of tons determined in the manner established by the advance royalty regulations in effect at the time the lessee requests approval to pay advance royalties in lieu of continued operation.

**Sec. 3. BONDS.** Lessee shall maintain in the proper office a lease bond in the amount of \$5,000. The authorized officer may require an adjustment in the amount of the bond to reflect changed conditions.

**Sec. 4. DILIGENCE.** This lease is subject to the conditions of diligent development and continued operation, except that these conditions are excused when operations under the lease are interrupted by strikes, the elements, or casualties not attributable to the lessee. The lessor, in the public interest, may suspend

the condition of continued operation upon payment of advance royalties in accordance with the regulations in existence at the time of the suspension. Lessee's failure to produce coal in commercial quantities at the end of 10 years shall terminate the lease. If not submitted already, lessee shall submit an operation and reclamation plan pursuant to Section 7 of the Act not later than 3 years after the effective date of this lease readjustment.

The lessor reserves the power to assent to or order the suspension of the terms and conditions of this lease in accordance with, inter alia, Section 39 of the Mineral Leasing Act, 30 U.S.C. 209.

**Sec. 5. LOGICAL MINING UNIT (LMU).** Either upon approval by the lessor of the lessee's application or at the direction of the lessor, this lease shall become an LMU or part of an LMU, subject to the provisions set forth in the regulations.

The stipulations established in an LMU approval in effect at the time of LMU approval will supersede the relevant inconsistent terms of this lease so long as the lease remains committed to the LMU. If the LMU of which this lease is a part is dissolved, the lease shall then be subject to the lease terms which would have been applied if the lease had not been included in an LMU.

**Sec. 6. DOCUMENTS, EVIDENCE AND INSPECTION.** At such times and in such form as lessor may prescribe, lessee shall furnish detailed statements showing the amounts and quality of all products removed and sold from the lease, the proceeds therefrom, and the amount used for production purposes or unavoidably lost.

Lessee shall keep open at all times for the inspection of any duly authorized officer of lessor, the leased premises and all surface and underground improvements, works, machinery, ore stockpiles, equipment, and all books, accounts, maps, and records relative to operations, surveys, or investigations on or under the leased lands.

Lessee shall allow lessor access to and copying of documents reasonably necessary to verify lessee compliance with terms and conditions of the lease.

While this lease remains in effect, information obtained under this section shall be closed to inspection by the public in accordance with the Freedom of Information Act (5 U.S.C. 552).

**Sec. 7. DAMAGES TO PROPERTY AND CONDUCT OF OPERATIONS.** Lessee shall comply at its own expense with all reasonable orders of the Secretary, respecting diligent operations, prevention of waste, and protection of other resources.

Lessee shall not conduct exploration operations, other than casual use, without an approved exploration plan. All exploration plans prior to the commencement of mining operations within an approved mining permit area shall be submitted to the authorized officer.

Lessee shall carry on all operations in accordance with approved methods and practices as provided in the operating regulations, having due regard for the prevention of injury to life, health, or property, and prevention of waste, damage or degradation to any land, air, water, cultural, biological, visual, and other resources, including mineral deposits and formations of mineral deposits not leased hereunder, and to other land uses or users. Lessee shall take measures deemed necessary by lessor to accomplish the intent

of this lease term. Such measures may include, but are not limited to, modification to proposed siting or design of facilities, timing of operations, and specification of interim and final reclamation procedures. Lessor reserves to itself the right to lease, sell, or otherwise dispose of the surface or other mineral deposits in the lands and the right to continue existing uses and to authorize future uses upon or in the leased lands, including issuing leases for mineral deposits, not covered hereunder and approving easements or rights-of-way. Lessor shall condition such uses to prevent unnecessary or unreasonable interference with rights of lessee as may be consistent with concepts of multiple use and multiple mineral development.

**Sec. 8. PROTECTION OF DIVERSE INTERESTS, AND EQUAL OPPORTUNITY.**

Lessee shall: pay when due all taxes legally assessed and levied under the laws of the State or the United States; accord all employees complete freedom of purchase; pay all wages at least twice each month in lawful money of the United States; maintain a safe working environment in accordance with standard industry practices; restrict the workday to not more than 8 hours in any one day for underground workers, except in emergencies; and take measures necessary to protect the health and safety of the public.

No person under the age of 16 years shall be employed in any mine below the surface. To the extent that laws of the State in which the lands are situated are more restrictive than the provisions in this paragraph, then the State laws apply.

Lessee will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended, and the rules, regulations, and relevant orders of the Secretary of Labor.

Neither lessee nor lessee's subcontractors shall maintain segregated facilities.

**Sec. 9(a) TRANSFERS**

- This lease may be transferred in whole or in part to any person, association, or corporation qualified to hold such lease interest.
- This lease may be transferred in whole or in part to another public body, or to a person who will mine the coal on behalf of, and for the use of, the public body or to a person who for the limited purpose of creating a security interest in favor of a lender agrees to be obligated to mine the coal on behalf of the public body.
- This lease may only be transferred in whole or in part to another small business qualified under 13 CFR 121.

Transfers of record title, working or royalty interest must be approved in accordance with the regulations.

**(b) RELINQUISHMENT.** The lessee may relinquish in writing at any time all rights under this lease or any portion thereof as provided in the regulations. Upon lessor's acceptance of the relinquishment, lessee shall be relieved of all future obligations under the lease or the relinquished portion thereof, whichever is applicable.

**Sec. 10. DELIVERY OF PREMISES, REMOVAL OF MACHINERY, EQUIPMENT, ETC.** At such time as all portions of this lease are returned to lessor, lessee shall deliver up to lessor the land leased, underground timbering, and such other supports and structures necessary for the preservation of the mine workings on the leased premises or deposits and place all workings in condition for suspension or abandonment. Within 180 days thereof, lessee shall remove from the premises all other structures, machinery, equipment, tools, and materials that it elects to or as required by the authorized officer. Any such

structures, machinery, equipment, tools, and materials remaining on the leased lands beyond 180 days, or approved extension thereof, shall become the property of the lessor, but lessee shall either remove any or all such property or shall continue to be liable for the cost of removal and disposal in the amount actually incurred by the lessor. If the surface is owned by third parties, lessor shall waive the requirement for removal, provided the third parties do not object to such waiver. Lessee shall, prior to the termination of bond liability or at any other time when required and in accordance with all applicable laws and regulations, reclaim all lands the surface of which has been disturbed, dispose of all debris or solid waste, repair the offsite and onsite damage caused by lessee's activity or activities incidental thereto, and reclaim access roads or trails.

**Sec. 11. PROCEEDINGS IN CASE OF DEFAULT.** If lessee fails to comply with applicable laws, existing regulations, or the terms, conditions and stipulations of this lease, and the noncompliance continues for 30 days after written notice thereof, this lease shall be subject to cancellation by the lessor only by judicial proceedings. This provision shall not be construed to prevent the exercise by lessor of any other legal and equitable remedy, including waiver of the default. Any such remedy or waiver shall not prevent later cancellation for the same default occurring at any other time.

**Sec. 12. HEIRS AND SUCCESSORS - IN-INTEREST.** Each obligation of this lease shall extend to and be binding upon, and every benefit hereof shall inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto.



State of Utah

JON M. HUNTSMAN, JR.  
Governor

GARY R. HERBERT  
Lieutenant Governor

Department of Community and Culture

PALMER DePAULIS  
Executive Director

State History

PHILIP F. NOTARIANNI  
Division Director

*Incoming of  
C/015/0015*

March 15, 2007

Wayne Hedberg  
Utah Division of Oil, Gas, & Mining  
1594 West North Temple, Suite 1210  
Salt Lake City, UT 84114-5801

RE: Emery Deep 160 Acre Extension, C/015/0015, Task ID #2749

In reply, please refer to Case No. 05-0681

Dear Mr. Hedberg:

The Utah State Historic Preservation Office received your request for comment on the above referenced project on March 12, 2007. We understand you may be acting on behalf of a federal agency and that you are also consulting under Utah Code 9-8-404.

We concur with your determinations of eligibility. We concur with your determination of **No Historic Properties Affected**.

This letter serves as our comment on the determinations you have made, within the consultation process specified in §36CFR800.4. Also, Utah Code 9-8-404(1)(a) denotes that your agency is responsible for all final decisions regarding cultural resources for this undertaking. Our comments here are provided as specified in U.C.A. 9-8-404(3)(a)(i). If you have questions, please contact me at (801) 533-3555 or [mseddon@utah.gov](mailto:mseddon@utah.gov).

Sincerely,

Matthew T. Seddon, Ph.D., RPA  
Deputy State Historic Preservation Officer - Archaeology

RECEIVED

MAR 15 2007

DIV. OF OIL, GAS & MINING



**State of Utah**

**Department of  
Natural Resources**

MICHAEL R. STYLER  
*Executive Director*

**Division of  
Oil, Gas & Mining**

JOHN R. BAZA  
*Division Director*

JON M. HUNTSMAN, JR.  
*Governor*

GARY R. HERBERT  
*Lieutenant Governor*

March 16, 2007

TO: Internal File

THRU: D. Wayne Hedberg, Permit Supervisor *DWH*

FROM: *JH* Joe Helfrich, Environmental Scientist, Biology

RE: DOGM's Informal Phone Consultation with USFWS and Informal Decision for The Emery Deep Mine 160-Acre IBC Extension, Consolidation Coal Company, Emery Deep Mine, C/015/0015, Task ID #2761

**DOGM TECHNICAL ANALYSIS SUMMARY:**

On September 13, 2006 the Division received an application from Consolidation Coal Company to add 160 acres to the existing permit boundary. During the week of February 5, 2007 this reviewer received several responses to the deficiencies enumerated in the Divisions letter to John Gefferth on January 17, 2007. On February 13, 2007 the Division received a formal written response to the deficiencies enumerated in the Divisions letter to John Gefferth on January 17, 2007. On March 6, 2007 the Division received a formal response to the deficiencies enumerated in the Divisions March 6, 2007 deficiency document. The additional permit acreage can be located on the Walker Flat 7.5 minuet quadrangle map, in SW1/4NW1/4, NW1/4SW1/4, NE1/4SW1/4, and SE1/4SW1/4 of Section 22, T. 22 S., R6E, SLBM. The project is intended to facilitate the uninterrupted mining and maximum recovery of the coal. There is no surface disturbance associated with this IBC.

**THREATENED, ENDANGERED, AND SENSITIVE ANIMAL/PLANT SPECIES**

The Application meets the requirements of R645-301-322 because the Application or MRP provides supporting documentation, and maps on threatened, endangered, and sensitive (TES) species that could occur within or adjacent to the IBC area.

The Emery County TES list includes Winkler Footcactus, Despain Footcactus, Barnabey's schoenocrambe, Wright Fishhook Cactus, Last Chance Townsendia, Maguire Daisy, Jones Cycladana, bonytail chub, Colorado pikeminnow, humpback chub, razorback sucker, Mexican spotted owl (MSO), black-footed ferret, bald eagle, and western yellow-billed cuckoo (candidate).

Additional species in Utah's Sensitive species list include the following;

**Conservation Agreement Species**

Northern Goshawk *Accipiter gentilis*

**Wildlife Species of Concern**

Grasshopper Sparrow	<i>Ammodramus savannarum</i>
Short-eared Owl	<i>Asio flammeus</i>
Burrowing Owl	<i>Athene cunicularia</i>
Ferruginous Hawk	<i>Buteo regalis</i>
Greater Sage-grouse	<i>Centrocercus urophasianus</i>
Black Swift	<i>Cypseloides niger</i>
Bobolink	<i>Dolichonyx oryzivorus</i>
Lewis's Woodpecker	<i>Melanerpes lewis</i>
Long-billed Curlew	<i>Numenius americanus</i>
American White Pelican	<i>Pelecanus erythrorhynchos</i>
Three-toed Woodpecker	<i>Picoides tridactylus</i>
Sharp-tailed Grouse	<i>Tympanuchus phasianellus</i>

Bald and Golden Eagles

Bald Eagles do not nest in the area but are typically inhabitants during migration. A raptor survey for the 4th East portal area was conducted in May of 2002. Survey results showed that there were one active, two inactive, and one dilapidated Golden Eagle nests on the cliffs in the canyons to the East and Southwest of the proposed permit area expansion. There were no nests within ½ mile of the proposed permit area expansion. The IBC application includes a reference to the results of the 2006 survey as Appendix D of the August 2006 exploration application. The application includes the results or data from the survey and a map. According to the information there are no nests or nesting raptors within ½ mile of the proposed IBC.

All supporting surveys (MRP) on TES plant and animal species show that there were no observations of threatened or endangered species in the areas surveyed. There have been no confirmed sightings of black-footed ferrets within Carbon County during 1995, 1996, and the first quarter of 1997 (DWR, Section 322.200).

The Division will not initiate a formal Consultation with USFWS for this 160-acre extension because there is no supporting data to suggest the presence of TE or their appropriate habitat, and because there is no surface disturbance for facilities.

Chapter II, page 25a of the application includes criterion for estimating mine water consumption for present and future mining operations. Calculations and numbers and references have been included with the criteria that are used in determining the mine water consumption value in acre-feet per year. According to the figures in table VI-23B page 169 the predicted discharge of 1.5 cfs would be approximately 1,086 acre feet per year minus the consumptive losses of 48.5 acre feet per year equal a net gain of 1037.5 acre feet per year net gain to the Colorado River watershed system. According to the USFWS protocol this net gain would constitute a "No Effect" determination.

**DOGM INFORMAL, PHONE CONSULTATION WITH USFWS SUMMARY:**

The Division initiated informal consultation with the USFWS (Betsy Herrmann) on March 15, 2007 for this IBC application. Joe Helfrich informed Betsy that there was no surface disturbance for the extension area and no known T & E species according to the survey performed by Dr. Collins. Joe also discussed with Betsy the mine water consumption calculations for the mine that resulted in a net gain of 1037.5 acre feet per year net gain to the Colorado River watershed system.

**DOGM INFORMAL DECISION**

The Division's determination is that the proposed Emery Deep Mine 160-acre expansion is "No effect" to threatened or endangered species listed for Emery County because there would be no surface disturbance, there is no depletion of water from the Colorado River basin and there are no observations that support the presence of T & E species.



IN REPLY REFER TO:

# United States Department of the Interior

OFFICE OF SURFACE MINING  
Reclamation and Enforcement  
P.O. Box 46667  
Denver, Colorado 80201-6667

UT-0005

October 20, 2006

Utah Division of Oil, Gas, & Mining  
Coal Regulatory Program  
1594 West North Temple, Suite 1210  
P.O. Box 145801  
Salt Lake City, Utah 84114-5801

*Heating*  
*01/15/0015-01*

RE: Consolidation Coal Company - "Emery Deep" Mine - Application for a Permit Revision,  
Incidental Boundary Change, Task ID No. 2646

Dear Sir or Madam:

This is in response to the Utah Division of Oil, Gas & Mining's (UT-DOGM) September 19, 2006, request for a decision, under 30 CFR 944.30, whether the above subject permit revision constitutes a mining plan modification.

Mining plan approvals by the Secretary of the Interior are required under the Mineral Leasing Act of 1920, 30 U.S.C. 181, *et seq.* before coal mining can occur on Federal lands. This letter serves to document OSM's determination whether or not a mining plan approval from the Secretary is required for the above permitting action.

OSM's review of the Application for a Permit Revision, Incidental Boundary Revision, has determined that it proposes to add 160 acres in Federal lease U-50044 to the permit area to allow for uninterrupted mining and the maximum recovery of coal reserves at the Emery Deep mine, Utah State permit C/015/015.

Based on a review of the activities associated with the permit revision, OSM has determined that the proposal does meet the requirements of 30 CFR 746.18(d)(3) and 746.18(d)(4). Therefore, the proposed Incidental Boundary Change permit revision does constitute a mining plan action requiring Secretarial approval. ✓

OSM's decision was based solely upon the Federal regulations under 30 CFR PART 746 and not the technical aspects of the revision application itself. Consequently, OSM's decision does not relieve UT-DOGM from coordinating the review and approval of the Application for a Permit Revision, Incidental Boundary Revision, with other Federal agencies for compliance with other Federal regulations.

OSM also electronically transmitted the September 19, 2006, request to the Bureau of Land Management and the U.S. Forest Service for their review and comment.

**TAKE PRIDE**  
**IN AMERICA** 

OCT 23 2006

2006 OCT 23 10:10 AM

In an electronic submittal dated September 20, 2006, the U.S. Forest service stated it had no comments or concerns with the permit revision.

In an electronic transmittal dated October 19, 2006, the Bureau of Land Management stated in its opinion the permit revision did not constitute a mining plan action requiring Secretarial approval.

Please notify the applicant of our decision on this matter.

Should you have any questions regarding this letter or approval, please contact Carl R. Johnston, Utah Federal Lands coordinator, at (303) 844-1400, extension 1500.

Sincerely,

A handwritten signature in black ink, appearing to read "Ranvir Singh", written in a cursive style.

Ranvir Singh  
Manager, Northwest Branch

cc: BLM - Utah State Office  
BLM - Price Field Office  
USFS - Manti-La Sal NF  
Denver Field Division

0001



## United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
Utah State Office  
P.O. Box 45155  
Salt Lake City, UT 84145-0155  
<http://www.blm.gov>



IN REPLY REFER TO:  
UTU-73335 (LMU)  
U-5287, U-50044  
(UT-923)

JAN 18 2007

Certified Mail-Return Receipt Requested

Mr. Ronald Stovash  
Senior Vice President -- Coal  
CONSOL ENERGY  
Consolidation Coal Company  
CNX Coal Operations Support  
1800 Washington Road  
Pittsburgh, PA 15341-1421

*Irwin  
1/15/07  
Copy PM*

Re: Minor Modification to the Resource Recovery and Protection Plan (R2P2), Full Extraction Mining, Emery Mine

Dear Mr. Stovash:

On November 27, 2006, the Bureau of Land Management (BLM) received a request (dated November 8, 2006) from Consolidation Coal Company to modify the subject R2P2 and to adjust their LMU. The R2P2 modification expands the mine plan and reflects full extraction tonnages and techniques for both of Consol's Federal coal leases (U-50044 and U-5287).

Consol requests that additional acreage be added to the LMU, and plans further expansion of this mine in the I coal seam to the north and east of the new 4<sup>th</sup> East portal. The R2P2 modification request cites the new portal location and the sealing of a portion of the old works as reasons for requiring the modification. Access to LMU reserves from the old portal location is no longer possible due to the sealing; however, reserves on both Federal coal leases, U-5287 and U-50044, are accessible from the new portal. Mine maps showing drillhole locations and locations of cross sections, coal ownership, ventilation plans, and timing sequence have been submitted. This modification request provides for full pillar extraction.

The BLM approves the subject R2P2 modification, which allows for a more efficient mine plan and a longer useful life of the recently-constructed 4<sup>th</sup> East Portal. Maximum Economic Recovery (MER) of coal on the subject Federal leases will be achieved by full extraction mining. The combined recoverable reserve base tonnage for the two lease tracts (labeled F-9 and F-10 in the R2P2 request) remains unchanged at 4,892,000 tons, according to Table 1 of the LMU / R2P2 modification request documents.

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JAN 19 2007

DIV. OF OIL, GAS & MINING

The approval of a minor modification to an existing R2P2 is Categorically Excluded from National Environmental Policy Act (NEPA) analysis since no new surface disturbance will occur from this action. (Overview of BLM's NEPA Process, February 1997, Appendix 2, page 2-7 (F)(7).)

Consol's proposed change to the R2P2 complies with the Mineral Leasing Act of 1920, as amended, the regulations at 43 CFR 3480, the lease terms and conditions, and will achieve Maximum Economic Recovery (MER) of the Federal coal. A copy of the approved mine map is enclosed.

If you have any questions, please contact Steve Rigby of the Price Field Office at (435) 636-3604 or Jeff McKenzie of my staff at (801) 539-4038.

Sincerely,

JAMES F KOHLER

James F. Kohler  
Chief, Solid Minerals

Enclosure:  
Approved Mine Maps

cc: Price Field Office (w/encl.)  
Utah Division of Oil Gas and Mining (w/o encl.)  
1594 West North Temple, Suite 1210  
Salt Lake City, Utah 84114-5801  
Price, UT-070

Consol Emery R2P2 Mod mining 1-12-07 pb-sa



## State of Utah

### Department of Natural Resources

MICHAEL R. STYLER  
*Executive Director*

### Division of Oil, Gas & Mining

JOHN R. BAZA  
*Division Director*

JON M. HUNTSMAN, JR.  
*Governor*

GARY R. HERBERT  
*Lieutenant Governor*

March 15, 2007

To: Compliance File

From: D. Wayne Hedberg, Permit Supervisor 

Re: 510 (c) Recommendation for Consolidation Coal Company, Emery Deep Mine, C/015/0015

As of this writing of this memo, there are no NOVs or COs which are not corrected or in the process of being corrected for the Emery Deep Mine. There are no finalized civil penalties, which are outstanding and overdue in the name of Consolidation Coal Company. Consolidation Coal Company does not have a demonstrated pattern of willful violations, nor have they been subject to any bond forfeitures for any operation in the state of Utah.

Attached is a recommendation from the OSM Applicant Violator System for the Emery Deep Mine that states there are no outstanding violations.

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Application Evaluation Report Applicant Violator System 15-Mar-2007 17:35:59

State : UT Permit No : ACT015015 Appl No : ACT015015  
Permittee : 107373( CONSOLIDATION COAL CO ) Seqno : 2  
Applicant : 107373( CONSOLIDATION COAL CO )

OSRBE Comments/Analysis: Date : 15-Mar-2007 Mode : VIEW

SRA Comments/Analysis: Date : 15-Mar-2007 Mode : UPDATE

SAVE(F5) DELETE(F8)  
PRV SCR(F3) QUIT(F4) CHOICES(F10)