



GARY R. HERBERT
Governor

GREG BELL
Lieutenant Governor

State of Utah

DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER
Executive Director

Division of Oil, Gas and Mining

JOHN R. BAZA
Division Director

COPY

Outgoing
C0250005
#3371
R

October 19, 2009

Chris McCourt, Manager
Alton Coal Development, LLC
463 North 100 West, Suite 1
Cedar City, Utah 84720

Subject: Decision Document and Application Approval, Alton Coal Development, LLC Coal Hollow Project, C/025/005, Task ID #3371, Outgoing File

Dear Mr. McCourt:

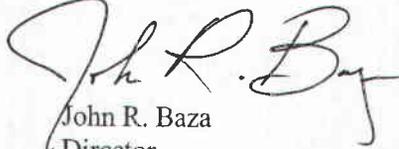
The Decision Document and "Proposed Permit" for the Coal Hollow Project are enclosed. The Division has made a decision to approve your application with conditions. Please note the conditions attached to the proposed permit. Once the permit is issued, Alton Coal Development, LLC will be required to adhere to the permit requirements and conditions.

Pursuant to R645-300-200, you, or interested parties, may file a request for a hearing before the Board of Oil Gas and Mining regarding the reasons for the decision within 30 days. The 30 days request period will end November 18 at 6:00 pm.

Issuance of the actual permit is pending the posting of the reclamation bond along with the reclamation agreement. Please contact Angela Nance at 801-538-5264 for the necessary paper work to complete this requirement. Also, in accordance with R645-301-112.900 and R645-301-113.400 you must also update, correct or indicate that no change has occurred in the information previously submitted under R645-301-112.100 through R645-301-112.800 and R645-301-113. Please note there are also some housekeeping issues identified in the Administrative Overview and Technical Analysis that need to be fixed at this time.

A copy of your approved (stamped incorporated) Operation and Reclamation Plan will be returned to you for your records. If you have any questions, please call Dana Dean, Associate Director - Mining, at (801) 538-5320, or Daron Haddock, Coal Program Manager, at (801) 538-5325.

Sincerely,


John R. Baza
Director

JRB/DRH/sqs
Enclosures

cc: Jim Fulton, OSM
Walt Baker, DEQ
Price Field Office

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File in:

Confidential

Shelf

Expandable

Refer to Record No. 0014 Date 10/19/2009

In C 0250005 2009 Outgoing

For additional information



**UTAH DIVISION OF OIL, GAS AND MINING
STATE DECISION DOCUMENT
AND APPLICATION APPROVAL**

Alton Coal Development, LLC
Coal Hollow Project
C/025/005
Kane County, Utah

October 15, 2009

CONTENTS

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- * CHIA, dated October 15, 2009
- * AVS Recommendation and Memo to File, dated October 15, 2009
- * Publication Notices
- * Insurance Certificate

ADMINISTRATIVE OVERVIEW

Alton Coal Development, LLC
Coal Hollow Project
C/025/005
Kane County, Utah

October 15, 2009

PROPOSAL

Alton Coal Development, LLC is applying for a permit to conduct surface coal mining operations at its site located south of the town of Alton, Utah in Kane County. The proposed development is the Coal Hollow Mining Project, which anticipates surface mining within a 635.64 acre permit area all in fee ownership. The center of the Coal Hollow Project is located approximately 3 miles south of the town of Alton, Utah. This project involves the development of a surface mining operation that will produce approximately 2,000,000 tons of coal annually for approximately 3 years. The coal will be transported from the Alton coalfield in trucks. The applicant has an interest in adjoining federal property and has applied to the BLM for additional leases through the Lease by Application (LBA) process. This Decision Document does not cover the development of the federal leases, which will be addressed under a separate permitting action.

BACKGROUND

On June 27, 2006 Talon Resources, Inc. submitted a new permit application for the Coal Hollow Mine. The application was reviewed, determined to be incomplete and denied on August 26, 2006. A new application was again submitted by Alton Coal Development, LLC, for the Coal Hollow Mine on June 14, 2007. This application was also reviewed, determined to be incomplete and denied on August 27, 2007.

On January 24, 2008, the Division received supplemental information as part of the application to permit the Coal Hollow Project. On March 14, 2008 the application was determined to be administratively complete and a technical review of the application commenced. Public notification, through the Southern Utah News, occurred from March 26, 2008 to April 16, 2008. An informal conference was requested and held on June 16, 2008 in the Alton City Hall. Several comments were received, reviewed and considered during the review process.

The review process consisted of the Division identifying deficiencies in the application and the applicant (Alton Coal Development, LLC) providing responses. Input from the public and other agencies was requested and considered during the process. Numerous meetings were

held to discuss the results. Alton Coal Development, LLC provided additional information on December 22, 2008, August 17, 2009 and October 8, 2009. Finally on October 14, 2009 the last submittal was made which incorporated all of the updates made throughout the review process and the application was considered to be complete and accurate with a few housekeeping still needed to clean up some inconsistencies in the application.

HOUSEKEEPING CORRECTIONS NEEDED

Required Supporting documentation to be provided before permit issuance:

R645 - 301- 622.300 requires strike and dip be shown on a map. Strike and dip are not evident on Drawings 6-1 and 6-6 (see statement in Section 622.300). Clearly indicate strike and dip on Drawings 6-1 and 6-6, or if strike and dip are shown on other maps, correct the reference in Section 622.300.

Add information on surface-water monitoring points SVWOBS-1 and SVWOBS-2 to Section 724.200 and appropriate maps.

Clear and concise issues to be corrected before permit issuance:

- Add Drawings 15 and 15B to the Table of Contents for Chapter 7.
- Clarify that silt fencing treating runoff from Watershed 6 will be placed on the upslope or east side of the relocated channel, rather than on the downslope or west side as indicated on Drawing 5-26.
- Update Section 731.600 Stream Buffer Zones to include “ephemeral streams that drain a watershed of at least one square mile” (R645-301-731.600 was reworded after the Applicant’s initial submittal).
- Page 5-59 still contains a reference to grading within 180 days which must be corrected to be in compliance with the requirements of R645-301-553.

RECOMMENDATION

All of the information submitted by Alton Coal Development, LLC has been found adequate to approve the application for a new permit for the Coal Hollow Mine. A Technical Analysis has been completed which indicates that the application is considered to be complete and accurate as long as a few specified conditions are complied with. A Cumulative Hydrologic Impact Assessment has been completed that has determined that the mining and reclamation operation has been designed to prevent material damage to the hydrologic balance outside the permit area. This permitting action was published in the Kane County Southern Utah News on March 26, April 2, 9 and 16, 2008. An informal conference was held on June 16, 2008 where comments on the application were received. Additional opportunity for comment and public

hearing was provided on March 25, 2009 when the Division published notice of temporary road relocation for K3900 and temporary road closure for K3993 in the Southern Utah News, in accordance with R645-103-234. The comment period ran for 30 days with no requests for a hearing received.

An OSM-AVS recommendation was requested on October 15, 2009, which indicated no outstanding violations.

A certificate has been provided through James Banasky Insurance Inc., which shows that Alton coal Development, LLC has an adequate public liability insurance policy in force.

It is, therefore, recommended that the application submitted by Alton Coal Development, LLC for the Coal Hollow Mine be approved with the conditions attached to the proposed permit. Once an adequate reclamation bond has been posted for the project and the Applicant has updated, corrected or indicated that no change has occurred in the information previously submitted under R645-301-112.100 through R645-301-112.88 and R645-301-113, a permit for the Coal Hollow Project can be issued.

PERMITTING CHRONOLOGY

Alton Coal Development
Coal Hollow Mine
C/025/0005
Kane County, Utah

October 15, 2009

- June 27, 2006 Talon Resources, Inc. submits new permit application for the Coal Hollow Mine.
- August 28, 2006 The Division determines the application incomplete and the application is returned.
- September 6, 2006 OSM determines that Federal Mine Plan approval not required for this surface operation on private lands to mine fee coal ((2006/Incoming/0008.pdf).
- June 14, 2007 Alton Coal Development, LLC submits revised permit application for the Coal Hollow Mine.
- August 13, 2007 OSM determines that Federal Mine Plan approval is not required (2007/Incoming/0012.pdf).
- August 22, 2007 The Division determines the application incomplete. The application is held pending further information.
- January 24, 2008 Alton Coal Development, LLC provides supplemental information to be reviewed with the June 14, 2007 application already on file.
- March 14, 2008 The Division makes a Determination of Completeness (2008/Outgoing/0001.pdf). Technical review begins as Task 2910.
- March 26,
April 2, 9 & 16, 2008 Notice of permit renewal application was published in the Southern Utah News for four consecutive weeks. (Copy provided to the Division, 2008/Incoming/0009.pdf)
- March 13, 2008 An Applicant Violator System check indicated that the company has not operated previously in the United States, but two of the officers have been previously engaged in coal mining operations. No unresolved or outstanding violations were retrieved from the system for these two officers.
- March 19, 2008 Division notifies agencies of the Determination of Administrative

Completeness for the Permit Renewal and requests comments by May 22, 2008 (Outgoing/0002.pdf).

March 31, 2008 Southern Utah Wilderness Alliance (SUWA) was sent an electronic version of the agency notification letter, indicating a comment date of May 22, 2008.

May 16, 2008 Thirty-day public comment period ends. Thirty-three comments received. Three of these commenters requested an informal conference.

May 22, 2008 Agency comment period ends. (The Governor's Office Resource Development Coordination Council (RDCC) published the May 22, 2008 end date on their web site, consequently the Division accepted public comment through the May 22, 2008 date) Nineteen additional comments were received and three additional requests for an informal conference.

Southern Utah Wilderness Alliance (SUWA) requests "Consulting Party Status" for cultural resource management.

June 16, 2008 Informal Conference held in Alton, Utah to receive comments on the proposed mine and the proposed relocation of County Rd. 136. Forty-seven members of the public were in attendance. Twenty commenters were heard. Director Baza extends Informal Conference written comment period to June 20, 2008.

In accordance with R645-300-131.120, the technical review period is suspended pending results of the Informal Conference.

June 20, 2008 Informal Conference written comment period ends. Twelve written comments were received, including a petition requesting further studies of natural and cultural resources in the adjacent area (2008\Incoming\0123.doc). The petition provides contact information for 37 supporters.

July 14, 2008 SHPO provided concurrence on the Cultural Resource Management Plan (CRMP) and data recovery plan for seven archaeological sites that will be adversely affected.

July 18, 2008 Director Baza signs Informal Conference Findings and Order Cause No C/025/005 (Outgoing/0024.pdf).

Technical review period resumes in accordance with R614-300-131.220.

August 4, 2008 List of deficiencies for Task 2910 and request for further information sent to Applicant. (Outgoing/0025.pdf) Technical review suspended until further information received from applicant.

August 13, 2008 Director Baza requests agreement from Alton Coal Resources, LLC to waive requirement for time limit imposed on the Division to issue written findings modifying, granting or denying the permit application within 60 days of the informal conference (2008/Outgoing/0027.pdf)

August 18, 2008 Agreement to above waiver received by signature from Denise Dragoo, Attorney for Alton Coal Development, LLC. (Incoming/0138.pdf).

September 2, 2008 Technical Analysis for Task 2910 sent to Applicant (Outgoing/0029.pdf).

December 22, 2008 Alton Coal Resources, LLC. provides supplemental information in response to August 4, 2008 list of deficiencies.

January 5, 2009 Review assignments made. Technical review resumes.

March 18, 2009 Draft Technical Analysis forwarded to Division management.

March 25, 2009 The Division published notice of temporary road relocation for K3900 and temporary road closure for K3993 in the Southern Utah News, in accordance with R645-103-234. (Copy provided to the Division, 2009/Incoming/0012.pdf) Comment period runs for 30 days from date of notice.

April 20, 2009 Division sent Technical Analysis containing deficiencies to Alton Coal Development.

June 16, 2009 Alton Coal Development provides Initial [partial] Response to Technical Analysis. (Given Task # 3338.)

July 2, 2009 Snell and Wilmer provides Division with legal opinion concerning Legal Standards Governing Identification of Alluvial Valley Floors. (2009/Incoming/0015.pdf).

August 27, 2009 Division receives complete response to Technical Analysis (Given Task #3371).

October 8, 2009 Division receives "Supplemental Information to Response of Technical Review [Sage Grouse and subirrigation study information].

October 15, 2009 Division makes Findings regarding decision to permit as required by R645-300-131.114. The Division has accrued a total of 271 days (9 months) technical and administrative review time.

October 15, 2009 CHIA and Technical Analysis are completed. Application Approved.

FINDINGS

Alton Coal Development, LLC
Coal Hollow Project
C/025/005
Kane County, Utah

October 15, 2009

1. The permit application for the Coal Hollow Project is accurate and complete and all requirements of the Surface Mining Control and Reclamation Act, and the approved Utah State Program (the "Act") are in compliance. See Technical Analysis dated October 15, 2009 (R645-300-133.100)
2. The applicant proposes acceptable practices for the reclamation of disturbed lands. The Division has determined that reclamation, as required by the Act can be feasibly accomplished following the approved plan with the attached permit conditions. The site will be returned to its pre-mining land uses of grazing, and wildlife habitat. (R645-300-133.710)
3. An 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 Division and no significant impacts were identified. See CHIA dated October 15, 2009. The Mining and Reclamation Plan (MRP) proposed under the revised application has been designed to prevent damage to the hydrologic balance in the permit area and in associated off-site area (R645-300-133.400 and UCA 40-10-11 (2)(c).
4. The proposed lands to be included within the permit area are:
 - a. not included within an area designated unsuitable for mining operations (R645-300-133.220);
 - b. not within an area under study or administrative proceedings to have an area designated as unsuitable for coal mining and reclamation operations. (R645-300-133.210);
 - c. not on any lands subject to the prohibitions or limitation of 30 CFR 761.11 {a} (national parks, etc), 761.11 {f} (public buildings, etc.) and 761.11 {g} (cemeteries);
 - d. is within 100 feet of Kane County public road K3900, however a public hearing was held on June 16, 2008 where opportunity for comment was provided. Another public notice and opportunity for a public hearing was provided in a newspaper notice dated March 25, 2009, regarding the temporary relocation of Kane County public road K3900 and the temporary closure of Kane County public road K3933. No requests for a

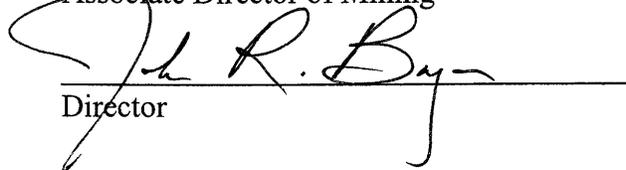
hearing were received and it has been determined that the interests of the public with regard to roads have been protected. (R645-300-133.220); and

- e. not within 300 feet of any occupied dwelling (R645-300-133.220).
5. The operation would not affect the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats as determined under the Endangered Species Act of 1973. See Technical Analysis dated October 15, 2009 (16 USC 1531 et seq.) (R645-300-133.500).
6. The Division's issuance of a permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800). See Technical Analysis dated October 15, 2009. (R645-300-133.600)
7. The applicant has the legal right to enter and complete mining activities in the permit area through leases with the following lessors: C. Burton Pugh, Roger M. Pugh, Margaret and Mark Moyers, Alecia Swapp Dame Trust. (R645-300-133.300)
8. A 510 (c) report has been run on the Applicant Violator System (AVS), which shows that: there are no prior violations of applicable laws and regulations or that all prior violations have been corrected; neither Alton Coal Development, LLC nor 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 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 (A 510 (c) report was run on October 15, 2009, see memo to file dated October 15, 2009. (R645-300-133.730)
9. The 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.
10. The applicant has provided a cost estimate for reclamation of the proposed disturbance associated with the Coal Hollow Project. Prior to the permit being issued the Applicant will file with the Division a bond covering the identified increment of land within the permit area upon which the operator will initiate and conduct coal mining and reclamation operations. (R645-300-134, R645-301-820).
11. No lands designated as prime farmlands or alluvial valley floors occur on the permit area. See Technical Analysis dated October 15, 2009 (R645-302-313.100 and R645-302-321.100)
12. The proposed postmining land-use of the disturbed area is the same as the pre-mining land use and has been approved by the Division.
13. The Division has made all specific approvals required by the Act and the Cooperative Agreement.

14. All procedures for public participation required by the Act, and the approved Utah State Program are in compliance. The public advertisement of administrative completeness and road relocation was published on March 26, April 2, 9 & 16, 2008 in the Southern Utah News. A second notice and opportunity for public hearing was published in the Southern Utah News on March 25, 2009. No requests for a hearing were received. (R645-300-120)
15. The applicant has indicated that there are no existing structures that will be used for the mining operation. (See Technical Analysis dated October 15, 2009) (R645-300-133.720).
16. Alton Coal Development, LLC agrees to pay all reclamation fees as required by 30 CFR Part 870. (R645-300-133.730)


Permit Supervisor


Associate Director of Mining


Director

DRAFT

NON-FEDERAL

PERMIT
C/025/0005

October 15, 2009

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, Utah 84114-5801
(801) 538-5340

This permit, C/025/0005, is issued for the state of Utah by the Utah Division of Oil, Gas and Mining (DOGM) to:

ALTON COAL DEVELOPMENT, LLC
463 North 100 West, Suite 1
Cedar City, Utah 84720
(435)867-5331

for the Coal Hollow Mine. Alton Coal Development, LLC is the owner of the entire surface parcel included within the permit area. A performance bond is filed with the DOGM in the amount of \$6,045,000.00, payable to the state of Utah, Division of Oil, Gas and Mining. DOGM must receive a copy of this permit signed and dated by the permittee.

Sec. 1 STATUTES AND REGULATIONS - This permit is issued pursuant to the Utah Coal Mining and Reclamation Act of 1979, Utah Code Annotated (UCA) 40-10-1 et seq, hereafter referred to as the Act.

TOWNSHIP 39 SOUTH-RANGE 05 WEST, SLB&M

Section 30: All of Section Lot #1 (NW $\frac{1}{4}$ NW $\frac{1}{4}$); NE $\frac{1}{4}$ NW $\frac{1}{4}$; N $\frac{1}{2}$ NE $\frac{1}{4}$; ALSO:
BEGINNING 3.50 chains West of the East Quarter corner of Said Section 30, and running South 34° 34' West 22.64 chains of the 1/16 section line; thence West 2.64 chains to the Southwest corner of NE $\frac{1}{4}$ SE $\frac{1}{4}$ of Said Section 30; thence North 40.00 chains; thence East 20.00 chains; thence South 14.69 chains; thence southwesterly to the point of beginning...containing 217.64 acres, more or less.

TOWNSHIP 39 SOUTH-RANGE 05 WEST, SLB&M

Section 29: BEGINNING at the Northwest corner of Said Section 29, and running thence South 34.69 chains; thence North 33° 22' East 35.50 chains; thence North 40° West 0.58 chains; thence North 37° 30' East 12.30 chains; thence West 22.23 chains to the point of beginning...containing 36.04 acres, more or less.

TOWNSHIP 39 SOUTH-RANGE 05 WEST, SLB&M

Section 19: SW $\frac{1}{4}$ SE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$...containing 160.0 acres, more or less.

TOWNSHIP 39 SOUTH-RANGE 05 WEST, SLB&M

Section 20: SW¼...containing 160.00 acres, more or less.

TOWNSHIP 39 SOUTH-RANGE 05 WEST, SLB&M

Section 30: BEGINNING at a point 5.31 chains North of the E¼ corner of Said Section 30, and running thence South 45.31 chains; thence West 20.00 chains; thence North 20.00 chains; thence East 2.64 chains; thence North 34° 34' East 22.64 chains to the 1/16 section line; thence North 33° 22' East to the point of beginning...containing 61.96 acres, more or less.

This legal description is for the permit area (635.64 acres) of the Coal Hollow Mine and included in the operation and reclamation plan on file at the Division. The permittee is authorized to conduct coal mining and reclamation operations connected with a preparation plant on the foregoing described property subject to the leases and Conditional Use Permit issued by Kane County, 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 becomes effective on October 15, 2009 and expires on October 16, 2014 (5 year term).
- Sec. 5 ASSIGNMENT OF PERMIT RIGHTS** - The permit rights may not be transferred, assigned or sold without the approval of the Director, DOGM. Transfer, assignment or sale of permit rights must be done in accordance with applicable regulations, including but not limited to 30 CFR 740.13(e) and R645-303.
- Sec. 6 RIGHT OF ENTRY** - The permittee shall allow the authorized representative of the DOGM, including but not limited to inspectors, and representatives of OSMRE, without advance notice or a search warrant, upon presentation of appropriate credentials, and without delay to:
- A. have the rights of entry provided for in 30 CFR 840.12, R645-400-110, 30 CFR 842.13 and R645-400-220; and,
 - B. be accompanied by private persons for the purpose of conducting an inspection in accordance with R645-400-100 and 30 CFR 842, when the inspection is in response to an alleged violation reported by the private person.
- Sec. 7 SCOPE OF OPERATIONS** - The permittee shall conduct coal mining and reclamation operations only on those lands specifically designated as within the permit area on the maps submitted in the mining and reclamation plan and permit application and approved for the term of the permit and which are subject to the performance bond.

- Sec. 8 ENVIRONMENTAL IMPACTS** - The permittee shall minimize any adverse impact to the environment or public health and safety through but not limited to:
- A. accelerated monitoring to determine the nature and extent of noncompliance and the results of the noncompliance;
 - B. immediate implementation of measures necessary to comply; and
 - C. warning, as soon as possible after learning of such noncompliance, any person whose health and safety is in imminent danger due to the noncompliance.
- Sec. 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 R645-3023 for compliance, modification, or abandonment of existing structures.
- Sec. 12 RECLAMATION FEE PAYMENT** - 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 DOGM. DOGM, after coordination with OSMRE, shall inform the permittee of necessary actions required. The permittee shall implement the mitigation measures required by DOGM within the time frame specified by DOGM.
- Sec. 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 DOGM and the permittee at any time to adjust to changed conditions or to correct an oversight. DOGM may amend these conditions at any time without the consent of the permittee in order to make them consistent with any new federal or state statutes and any new regulations.

THE STATE OF UTAH

By: **DRAFT**

Date: _____

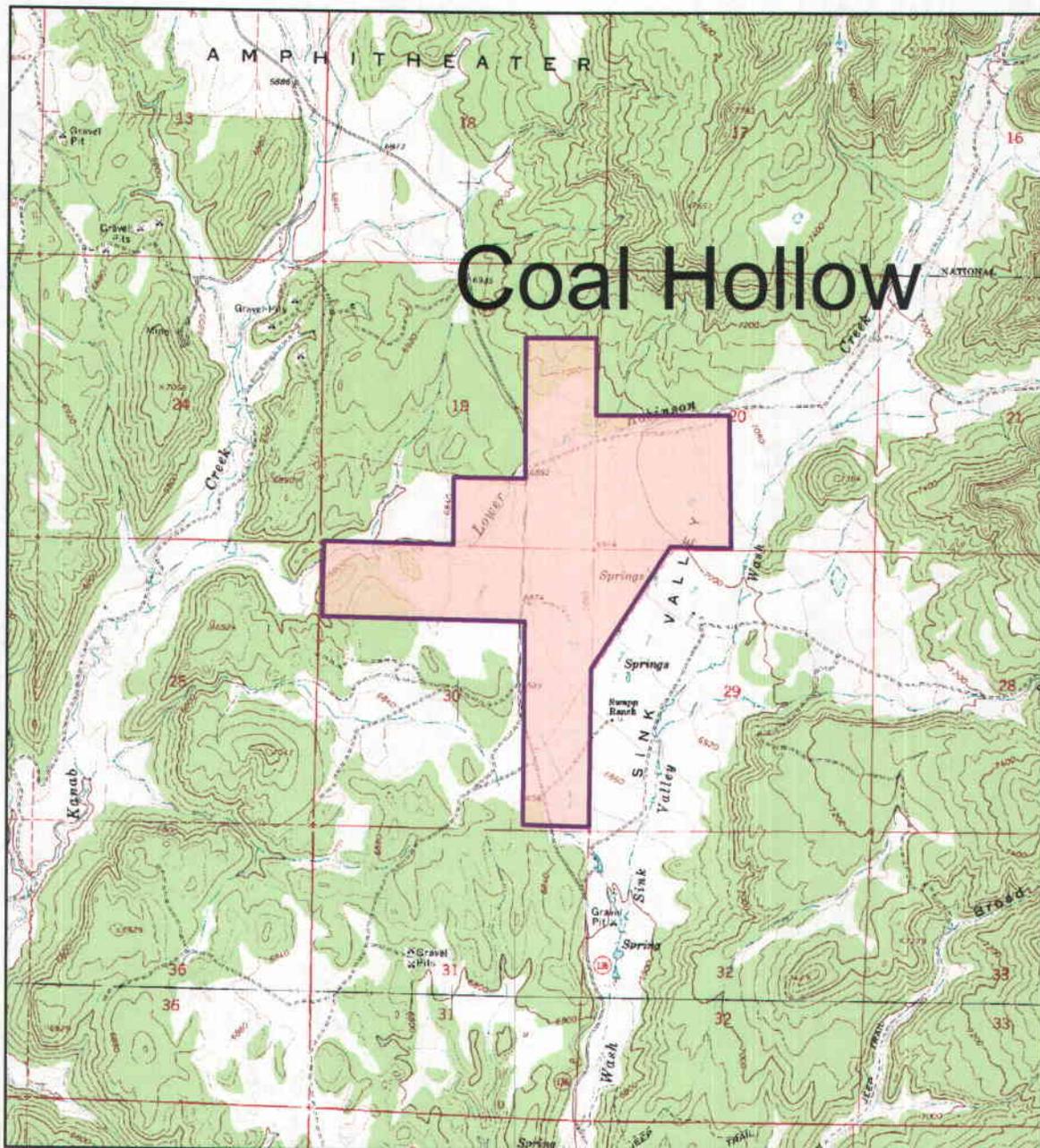
I certify that I have read, understand and accept the requirements of this permit and any special conditions attached.

Authorized Representative of the Permittee

Date: _____

ATTACHMENT A
SPECIAL CONDITIONS

1. Alton Coal Development, LLC (ACD) will submit water quality data for the Coal Hollow Mine in an electronic format through the Electronic Data Input web site, <http://linux1.ogm.utah.gov/cgi-bin/appx-ogm.cgi>.
2. In the event that ACD encounters large volumes of groundwater (a sustained flow of more than 1 cfs) in any pit other than pit 15, they will be required to notify the Division, and assess and submit plans to curtail inflows to the pit and reestablish groundwater movement.
3. When filling and reclaiming pits, porous fill material must not be left adjacent to the alluvial aquifers. As mining progresses to the south of Pit 15, if the coarse grained alluvium zone connected to the adjacent artesian water system is intersected by mining and a sustained flow greater than 1 cfs is encountered, the compacted shale barrier constructed in Pit 15 must then be extended south to these points of intersection. This extension of the shale barrier will meet the same specifications described in the application for the Pit 15 permanent barrier.
4. The Applicant will be required to monitor for selenium where water leaves the minesite, during operational and reclamation phases.
5. The Applicant will be required to evaluate discharges from the mine to determine any impacts to the designated AVF on Kanab Creek. An annual finding should be placed in the Annual Report during operation and reclamation of any adverse impacts to the channel, diminution of water quality and impacts to wildlife.
6. The Applicant must receive an Air Quality Approval Order prior to conducting surface mining.
7. Satisfactory compliance with the Alton Sage-Grouse Habitat Protection plan is required. Alton Coal Development, LLC will use best technology currently available to achieve the objectives of the plan in order to minimize the disturbances and adverse impacts to the sage grouse and related habitat and to enhance those resources where practicable. ACD will cooperate with the Division in consultation with the state and federal wildlife agencies to develop reasonable practices and methods as are determined to be necessary to implement the plan and to measure success and to achieve the goals of the plan.

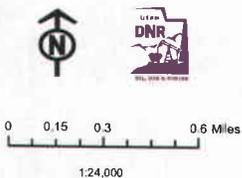


Coal Hollow Mine

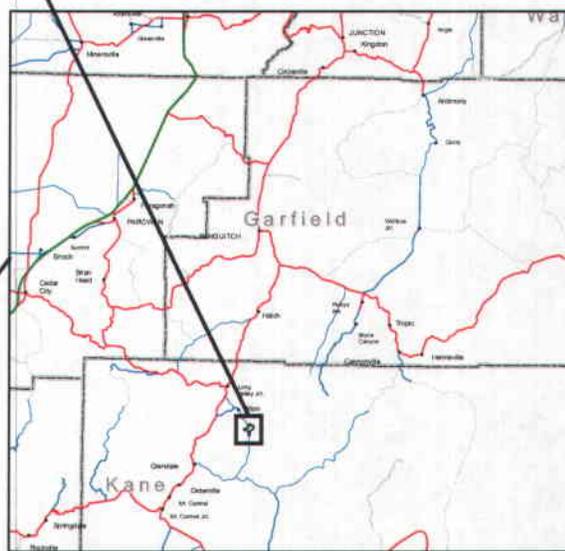
C0250005
Kane County, Utah

Township 39 South Range 5 West

- | | |
|--|--|
|  Permit Area |  Proposed State Permit Modification |
|  Proposed Mine Plan Modification (if shown) |  Active Permit |
| |  In Reclamation |
| |  Retained-Final Bond Release |



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NAD 1983 UTM Zone 12N



Locator Map



0001

JON M. HUNTSMAN, JR.
Governor

GARY R. HERBERT
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
Division of Oil, Gas & Mining

MICHAEL R. STYLER
Executive Director

JOHN R. BAZA
Division Director

JK

March 14, 2008

Chris R. McCourt
Alton Coal Development, LLC
463 North 100 West, Suite 1
Cedar City, Utah 84720

Subject: Administrative Completeness Review – Determined Complete, Alton Coal Development, LLC, Coal Hollow, C/025/005, Task ID #2910, Outgoing File

Dear Mr. McCourt:

On January 24, 2008 Alton Coal Development, LLC provided the Division with supplemental information to be incorporated into the June 14, 2007 Coal Hollow Mine application package for a surface coal mining operation near Alton, Utah. The full application has been determined to be complete. A copy of the Administrative Completeness Review (ACR) is enclosed.

Alton Coal Development, LLC must now provide public notification of the proposal as required by R645-300-121.100. The notice must be in a local newspaper at least once a week for four consecutive weeks and must contain all the information described in R645-300-121.100 *et seq.* Please note our comments on the attached ACR form before proceeding with public notice. Alton Coal Development, LLC must provide a copy of the complete application for public review at the Kane County Courthouse by the time of the first public notice (R645-300-121.200). A copy of the publication should be sent to the Division as soon as it is available. An affidavit of publication will also be required to be in the final application.

We will proceed with our obligation to notify local, state and federal government agencies of your intent to conduct surface coal mining on the 635.64 acre tract of land Located in Kane County, T.39 S., R.5 W., Sections 19, 20, 29 and 30, approximately 3 miles south of Alton on County Rd. #136 (R645-300-121.300 *et seq.*).

A technical review of your plan will be initiated. Review of new surface mine permit applications may not exceed one year (R645-300-131.114). Prior to approval, the Division must find that your application is technically complete. We expect to convey our progress to you in ninety days (June 19, 2008), which will allow time to incorporate any public comment into our review. The Division will also coordinate with other agencies and incorporate their comments into our review process.

Page 2
Administrative Completeness
March 14, 2008

We look forward to working with you throughout the permitting process. Please contact Priscilla Burton at (435) 613-3733 or myself at (801) 538-5325 with your questions.

Sincerely,

A handwritten signature in black ink that reads "Daron R. Haddock". The signature is written in a cursive style with a large initial "D" and "H".

Daron R. Haddock
Permit Supervisor

PWB/an
Enclosure
cc: Mary Ann Wright
Price Field Office
O:\025005.COL\FINAL\WG2910\App2910.doc

State of Utah



Coal Regulatory Program

Coal Hollow
C/025/0005
Alton Coal Development, LLC
Technical Analysis
October 15, 2009

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TECHNICAL ANALYSIS DESCRIPTION

This Technical Analysis (TA) is written as part of the permit review process. It documents the Findings that the Division has made to date regarding the application for a permit and is the basis for permitting decisions with regard to the application.

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 Coal Rules found in the Utah Administrative Code (R645) establish the procedures through which the Division implements these Acts.

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.

This Technical Analysis is done on the Alton Coal Development, LLC application to develop a portion of the Alton coal field. The proposed development is the Coal Hollow Mining Project, which anticipates surface mining within a 635 acre permit area all in fee ownership. The center of the Coal Hollow Project is located approximately 3 miles south of the town of Alton, Utah. This project involves the development of a surface mining operation that will produce approximately 2,000,000 tons of coal annually. The coal will be transported from the Alton coal field in trucks. The applicant has an interest in adjoining federal property and has applied to the BLM for additional leases through the Lease by Application (LBA) process. This TA does not cover the development of the federal leases which will be addressed under a separate permitting action.

PERMIT APPROVAL STIPULATIONS:

The applicant has proposed to establish a compacted shale barrier along pit 15 if substantial flows are intercepted into the mine. The Applicant/Operator of the Coal Hollow Mine will be required to assess and submit plans to curtail and reestablish groundwater movement in the event large volumes of groundwater (greater than 1 cfs) is intercepted in any of the other mine pits.

When mining is done in each pit, it is to be filled and reclaimed. Porous fill material must not be left adjacent to the alluvial aquifers, because that would facilitate continuous drainage from the aquifers into the fill in the pits. A grout curtain or geomembrane would be possible methods of blocking ground-water flow across this boundary, but the Applicant may

devise other methods to achieve this purpose. The applicant must provide a design for the margin, where the pits meet the undisturbed alluvium, and specific techniques to be used to minimize drainage from the alluvium into the fill in the reclaimed pits. In the cover letter for the December 2008 submittal, the Applicant states that this has been addressed, but the information could not be found in Chapters 5 or 7.

The Applicant will be required to monitor for selenium where water leaves the minesite, during operational and reclamation phases.

The Applicant will be required to evaluate discharges from the mine to determine any impacts to the designated AVF on Kanab Creek. An annual finding should be placed in the Annual Report during operation and reclamation of any adverse impacts to the channel, diminution of water quality and impacts to wildlife.

The Applicant must receive an Air Quality Approval Order . The information provided in the application may meet the requirements of the Air Quality rules for **R645-301-423.200**, however, the Division does not provide training for permitting staff or inspectors in the application of EPA Method 9. Consequently, it is recommended that the Division request that the Utah DAQ evaluate this fugitive dust control plan prior to issuance of the air quality permit, under the auspices of the MOU to cooperate for the purposes of permitting, signed on September 1, 1999.

Required Supporting documentation to be provided before permit issuance:

R645-301-622.300 requires strike and dip be shown on a map. Strike and dip are not evident on Drawings 6-1 and 6-6 (see statement in Section 622.300). Clearly indicate strike and dip on Drawings 6-1 and 6-6, or if strike and dip are shown on other maps, correct the reference in Section 622.300.

Add information on surface-water monitoring points SVWOBS-1 and SVWOBS-2 to Section 724.200 and appropriate maps.

Clear and concise issues to be corrected before permit issuance:

- Add Drawings 15 and 15B to the Table of Contents for Chapter 7.
- Clarify that silt fencing treating runoff from Watershed 6 will be placed on the upslope or east side of the relocated channel, rather than on the downslope or west side as indicated on Drawing 5-26.
- Update Section 731.600 Stream Buffer Zones to include “ephemeral streams that drain a watershed of at least one square mile” (R645-301-731.600 was reworded after the Applicant’s initial submittal).
- Page 5-59 still contains a reference to grading within 180 days which must be corrected to be in compliance with the requirements of R645-301-553.

GENERAL CONTENTS

IDENTIFICATION OF INTERESTS

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

Analysis:

In Chapter 1, Section 112, the applicant has met the requirements to provide ownership and control information for the operation and surface lands affected. The applicant and operator is Alton Coal Development, LLC, a limited liability company. The company is registered with the Utah Department of Commerce (Confidential Binder, Appendix 1-1). The corporate office is in Cedar City. The telephone and address is provided. The list of company officers' names and addresses and percent ownership, and the employer identification number have been provided in Section 112.310 and Section 112.320. The last four digits of the federal identification numbers were provided in the confidential file for the original owners, but were not provided for the two new members who together own 25% of the company. The beginning and ending dates for the two new and two leaving members were provided on October 13, 2009. One new member was listed with a retroactive begin date of 9/9/2004.

Chris McCourt is the resident agent and manager. Robert C. Nead, Jr., has been designated as the person responsible for paying the abandoned mine land reclamation fee (Section 112.230).

Surface and coal ownership are displayed on Dwg. 1-3 and 1-4, respectively and described in Section 112.500. The permit area surface is owned by two parties: C. Burton Pugh and the Allecia Swapp Dame Trust, administered by Richard Dame, Trustee. (Contact information for the surface owners have been provided.) Surface lands have been leased to the applicant. The lease assignments are included in the Confidential binder, Appendix 1-2.

Section 112.500 also provides the name and addresses of the owners of the coal to be mined. All 435 acres of coal to be mined is privately held, and has been leased by Alton Coal. The leases are provided in the Confidential binder, Appendix 1-2. There are 200 acres of coal owned by the Bureau of Land Management (BLM) in the north portion of the permit area shown on Dwg. 1-4, but this coal will not be mined.

Adjacent surface and subsurface ownership is displayed on Dwg. 1-3 and 1-4. As stated in Section 112.600, the BLM and Darlynn and Arlene Sorensen own land contiguous to the permit area. James Lloyd and Julie Johnson Brinkerhoff own land that is downstream, but not contiguous to the permit area.

GENERAL CONTENTS

Interest in adjacent federal coal is outlined in Section 112.800. The applicant has filed a lease by application with the BLM. At this time, the BLM is writing an Environmental Impact Statement. The BLM has determined the size of the Alton Coal Tract LBA to be approximately 3,600 acres (BLM Open House, Salt Lake City, February 2007).

The MSHA number for the mine site is 42-02519 (Section 112.700). MSHA numbers for structures are pending.

Findings:

The information provided meets the minimum requirements of the Regulations for Identification of Interests.

VIOLATION INFORMATION

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

Analysis:

Section 113 of the application states that there are no violations, suspensions, revocations, or forfeitures on record for Alton Coal Resources, LLC., or its officers or affiliates. An Applicant Violator System check indicated that the company has not operated previously in the United States and that two of the officers have been previously engaged in coal mining operations. No violations were retrieved from the system on October 15, 2009.

Findings:

The applicant has met the requirements of the Rules for Violation Information.

RIGHT OF ENTRY

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

Analysis:

The applicant has right of entry to 794.74 acres in T. 39 S., R. 5 W. Salt Lake Meridian, Sections 19, 20, 29, and 30. The application states that right of entry was obtained through lease agreement with the surface and mineral lease owners (Section 114). These agreements are found in the Confidential Binder, Appendix 1-2. Fee coal beneath Pugh surface is held by several individuals: C. Burton Pugh.. 40.5% of the coal; Margaret Moyers, 22.5%, and Roger Pugh, 37% (according to p. 32 of the Roger Pugh lease document). (Roger Pugh inherited the coal ownership from Verna Pugh who is deceased (personal communication from Chris McCourt on February 18, 2009).

Specific surface lands are described in the C. Burton Pugh lease document, which encompasses 732.78 acres (App. 1-2, Ex. 1), which includes land east of the permit area. Interest in the subsurface east of the permit area was declared in Section 112.800. The Moyers and R. Pugh lease documents encompass 372.68 subsurface acres of coal within the permit area, as shown by Dwg 1-4.

Exhibit 2 of Appendix 1-2 is the Dame Trust lease, which was signed by the Trustee, Richard Dame, on April 29, 2005. Specific lands are described in the Dame lease document, encompassing 61.96 acres.

Findings:

The information provided meets the requirements of the Regulations for Right of Entry.

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:

Section R645-103 establishes procedures for designating lands unsuitable for all or certain types of coal mining and reclamation operations on state and private lands. The authority to make determinations of unsuitability on federal lands is reserved to the Secretary of Interior. The rules contain two general categories of designation (1) statutory designations and (2) designations by petition.

Statutory designations are described in R645-103-200 and require the Division, upon receipt of a complete permit to determine whether a proposed coal mining and reclamation operation can be authorized in light of the mandatory prohibitions set forth in the Act at §40-10-24(4). These prohibitions include:

- Lands prohibited under public law examples include National Parks, National Forests, Refuges, National Trail Systems, Wilderness, and Scenic Rivers;
- On any lands which will adversely affect public parks or places on the National Register of Historic Sites (with exceptions);
- Within 100 feet of or relocation of a public road, (with exceptions); and
- Within 300 feet of an occupied dwelling, school, church, or public building, (with exceptions).

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The general rules for both designations (statutory and petition) require the Division to integrate as closely as possible suitability decisions with present and future land use planning and regulatory processes at the state and local levels.

This review does not analyze designations by petitions to designate lands unsuitable because the Division has not received a petition.

Land Use Planning at the State and Local Levels

Almost 88 percent of the Kane County land base is in federal ownership. The Utah State Institutional and Trust Lands Administration control an additional 8 percent leaving 4 percent of the land in private ownership. Thus any planning on federal or state lands greatly impacts Kane County. The State of Utah develops resource plans on a state level but generally recognizes the local county and municipal governments as having land use planning authority. While the Coal Hollow Coal Mine is all on private property, State policy (§63J-4-401(6)(a)) on federal lands is to:

- Promote multiple use;
- Achieve a high level of mineral output; and
- Support mineral development at the highest reasonably sustainable level.

State code (§63J-4-401(8)(m)) further specifies that on federal lands state policy is that:

- Mineral and energy production and environmental protection are not mutually exclusive;
- It is technically feasible to permit appropriate access to mineral and energy resources while preserving other resources; and
- Development of the solid mineral resources of the state should be encouraged.

The document Kane County Utah General Plan for the Physical Development of the Unincorporated Area Pursuant to Section 17-27-301 of the Utah Code, (Adopted June 1998 and written by Five County Association of Governments) recognizes the presence of extensive mineral deposits and a potential resource for future generations. The plans focus on federal lands because:

"Privately owned land is adjacent to federal and state lands. Management decisions for the federal and state lands directly impact use of, and the economic value of, private land."

One of the stated purpose and intent of public lands policy for energy and mineral resources is:

"The mining industry makes up an important part of the property tax base of the County, and its payroll and expenditures for supplies are important to the economic stability of the County. Mining is one of the historic

GENERAL CONTENTS

multiple uses on federally managed land and maintenance of the use is compatible with the multiple use principle."

According to the Kane County Planning and Zoning Map the area within the proposed permit area (T39S, R5W sections 19, 20, 29, and 30) is zoned for Agriculture (AG) and Residential Recreation (REC-R36). The Kane County Land Use Ordinance, July 1, 1998, Revised November 11, 2006 states the purpose of these two zones as follows:

REC-R36: To permit use of designated area for grazing, forestry, mining, recreation, and other activities and to protect the natural resources of the area for the benefit of present and future generations.

AG: To preserve appropriate areas for permanent and temporary agricultural and open space areas as defined herein. Uses normally and necessarily related to agriculture are permitted and uses adverse to the continuance of agricultural activity are not allowed (http://kane.utah.gov/deptinfo.cfm?deptID=8&pnl=1_2).

The Land-use Ordinance indicates that surface and underground mines are not allowed in agriculturally zoned areas; however, zone modifications or conditional use permits are permitted following established procedures subject to Kane County Planning Commission approval. (2009/incoming/0006.pdf). The postmining land use for the land is stated as agricultural use, grazing for livestock production, recreation, hunting, and wildlife habitat.

On March 13, 2009, the Kane County planning commission granted two Conditional Use Permits, one covering approximately 400 acres on property owned by Sink Valley Ranch, LLC and another on approximately 62 acres on property owned by Richard Dame. These Conditional Use Permits specifically allow surface coal mining and reclamation activities. Copies of the permits are found in Appendix 1-9.

The Kane County Commission sent a letter of support for the project on June 13, 2007 and again during the public comment period on May 16, 2008 (2008/incoming/0063.pdf). The town of Alton sent a letter to Alton Coal Development, May 9, 2008, "hardily" endorsing the mine (2008/incoming/0038.pdf).

Lands prohibited under Public Law 95-87: All lands are on private (fee) surface and coal, except for a small area of federal coal with private surface, which will not be mined. No lands within the permit area are located within the boundaries of any National designation (MRP Section 411.141).

National Register of Historic Places or Parks: No parks (Section 411.141.1) or places included in the National Register of Historic Places (Section 411.140) are found within the area of proposed coal mining and reclamation operations. (However, fourteen sites eligible to the NRHP were identified in a June 2005 inventory of the proposed permit area. Seven of these eligible sites will be adversely affected by the proposed

GENERAL CONTENTS

action. A data recovery plan has been implemented and a mitigation plan or a Cultural Resource Management Plan developed for this area and the proposed federal lease area. Concurrence on the mitigation plan for the seven sites was received from SHPO on July 14, 2008 (2008/incoming/pdf 0135))

Within 300 feet from any occupied dwelling, cemetery, or public or community building: No mining will occur within 300 feet of an occupied dwelling, building, school, church, community, institutional building, or public park, or within 100 feet of a cemetery. The Swapp Ranch House is located just outside the 300 foot distance (Drawing 1-5).

Within 100 Feet or Relocation of a Public Road: Kane County Road K3900 (also known as County Road 136 or The Sink Valley Road), a class B multiple use public road, is located within the mine permit area and mining boundaries. Kane County Road K3993 (also known as the Robinson Creek Road) is also located within the mine permit area. The rules allow an exception to unsuitability if: (1) an approval from the road authority is obtained; (2) public notice and opportunity for public hearing provided; and (3) a written finding is made that the interests of the public and landowners affected will be protected.

The mine proposes to relocate the K3900 road during mining. The road realignment is within the primary jurisdiction of Kane County and includes a right of way across Public Lands issued by the BLM. Approvals have been sought and obtained from the county and BLM to temporarily relocate the road to the west on Public Lands. After reviewing the Environmental Assessment, dated November 2008, the BLM Kanab Field Office Manager issued a FONSI on December 12, 2008 to allow the right-of-way for the road relocation on Public Lands (Appendix 1-7). Kane County and Alton Coal Development entered into an agreement on November 24, 2008 to relocate the road.

Public Notice of the mine permit application and K3900 road relocation was published March 26th through April 16, 2008 in the Southern Utah News (2008/Incoming/0009.pdf). Information concerning K3993 was not published at this time because the Division was not aware that K3993 was a public road. The K3993 road is a two track road that provides access to the Forest Service boundary along lower Robinson Creek. Since this road goes through the mine site, it is proposed that the public be escorted by mine personnel when using the road. No comments on the road or requests for a public hearing for relocation of K3900 were received. However requests for public hearing was received on the mine permit application and the Division noticed the public hearing to receive comment on the mine application and road relocation (2008/outgoing/0018.pdf). The Hearing was held June 16, 2008 in Alton, Utah. The relocation of the road was described at the public hearing. No verbal comments were received on the road relocation. One written comment was received concerning the road relocation. The one comment stated the use of the present road is for moving farm equipment and livestock, activities which are not compatible with mining. The commenter stated that good fencing and cattle guards would be necessary along the realigned road to enable its use for agricultural activity (2008/Incoming/0129.pdf). The BLM EA and FONSI stipulations require that wherever the alignment crosses a

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maintained fence, a new cattle guard and gate to be constructed to allow the allotment to remain useable.

Director of the Division, John Baza, issued a Findings and Order for the informal conference (2008\outging\0024.pdf) within 30 days of closing the conference. The findings associated with K3900 were: (1) there is not sufficient information concerning the details of the road relocation to make the necessary findings; (2) additional information will be available when the right-of-way is issued and Kane County and Alton Coal Development are in final agreement; and (3) when additional information is available the Division will provide opportunity for public hearing and a finding concerning the road relocation.

After receiving additional information about the relocation of Kane County road K3900 and on the temporary closure of Kane County road K3933, the Division provided another opportunity for a public hearing regarding these roads. Notice was published in the Southern Utah News on March 25, 2009 which allowed 30 days for anyone to request a hearing regarding these roads. No request for a hearing was received.

The Division finds that the interests of the public and landowners affected will be protected based upon the following:

- The re-routed road will not be used as a mine road or haul road. The relocation provides for public health and safety by rerouting the road outside the mine permit area so that public use and mine use is separated. Once mining concludes the road will be reestablished to near its original configuration.
- The relocation of the K3900 road starts about 2 miles south of the town of Alton at the north end of Section 19. The road will be routed to the west around the mine site and then join back up with the original alignment in Section 31.
- Kane County and Alton Coal Development entered into an agreement titled: An Agreement to Temporarily Close, Relocate, and Replace Kane County Road Number K3900, Known As The Sink Valley Road. The recitals state: "WHEREAS, for the public health, safety and welfare, a portion of Kane County Road K3900 will be relocated outside the boundaries of the Mine Permit Area during the period of mining activities within the Mine Permit Area ("Relocated Section") and then restored to its original location." (Appendix 1-7, County Road 136 (K3900) Approvals and Agreements). Kane County and Alton Coal Development entered into an agreement providing for a public safety escort along the Robinson Creek Road (K3933) within the Coal Hollow Mine area. This agreement provides for Alton Coal to escort personnel twenty-four hours a day, seven days a week during the entire period mining operations affect the safety of public travel along the Robinson Creek Road, otherwise public travel along the Robinson Creek Road shall not be restricted. (See Appendix 1-8)
- The FONSI issued by the BLM Kanab Field Office Manager on December 12, 2008 (Appendix 1-7) recognizes in the rational for the decision that:

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"This relocation provides for more recoverable coal as well as for the health and safety of the public by preventing the interaction of large mining equipment with public traffic."

Findings:

This review documents the Division's decision as to whether the proposed coal mining and reclamation operation can be authorized in light of the mandatory prohibitions set for the in the Act.

- Suitability for permit application is in conformance with State and County land use planning and regulations. State regulations and policy promote multiple uses, and support and encourage mineral development. Kane County land use plans recognize the mineral resources of the county and their importance to the economic stability of the county. Kane County and Alton Town Inc. are supportive of the mine.
- The area to be mined is within private surface and coal except for a small area of federal coal that will not be mined. There are no Federal lands or adjacent Federal lands prohibited under Public Law 95-87 proposed to be disturbed by coal mining.
- No parks or places included in the National Register of Historic Places are found within the area of proposed coal mining and reclamation operations.
- No mining will occur within 300 feet of an occupied dwelling, building, school, church, community, institutional building, or public park, or within 100 feet of a cemetery.
- Kane County Road K3900 (also known as County Road 136 or The Sink Valley Road), a class B multiple use public road, is located within the mine permit area and mining boundaries and will be relocated during mining. Public Notice and Hearings have been conducted on the relocation. County and BLM approvals have been obtained for the relocation. This document makes a finding that the interests of the public and landowners affected will be protected; A finding can also be made on public road K3993, that the interests of the public and landowners will be protected. The Public Notice was made in Southern Utah News on March 25, 2009. No requests for a hearing were received.

PERMIT TERM

Regulatory References: 30 CFR 778.17; R645-301-116.

Analysis:

The permit term of five years will allow for the three year mining plan and reclamation of the last 1000 ft. of highwall within a single permit term. The applicant has not requested a longer term. Section 116 of the application describes the acreage to

be mined during each of the three years of mining activity. The disturbance sequence is shown on Dwg. 5-2. A total of 433 acres will be mined.

Findings:

The information provided meets the requirements for a five-year mining permit.

PUBLIC NOTICE AND COMMENT

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

Analysis:

A draft of the public notice was provided with the application in Appendix 1-5. A revised version of this notice appeared in the Southern Utah News from March 26 through April 16, 2008. A copy of the public notice, as it appeared, was sent to the Division by email on April 2, 2008 and was made part of the public record (2008/Incoming/0009.pdf). The notice indicated that the public comment period would run for 30 days after the last notice. i.e. until May 16, 2008. Within this timeframe, supportive comments were received from the Kane County Commission, Representative Mike Noel, Alton Mayor Claren Heaton, the Utah Mining Association and from 6 regional residents (from Kanab, St. George, Cedar City, and other unspecified locations). Supportive comments focused on the need for jobs and industry in the region and the need to provide for energy independence.

Also within this time frame, negative comments were received from 7 out of state residents (Alaska, Pennsylvania, Ohio, Nevada and unspecified locations); 8 regional residents (Kanab, St. George, Santa Clara, and other unspecified locations) and one housing subdivision corporation east of Bryce Canyon National Park and the organization Save Our Air & Resources (Richfield Utah); one Hatch resident; and 16 Panguitch business and homeowners whose main concerns were the affects to the tourist industry by the transportation of coal (300 trucks daily) in the SR 89 corridor (recently designated the "Mormon Pioneer Heritage Highway") and through the Panguitch National Historic District; the affects of coal truck traffic on safety; the affect of particulates on visibility and the affect of lighting on the night sky; the displacement of wildlife; the affects to water resources from selenium and mercury; and the affects of a haul route through Alton. Three of these petitioners requested an informal conference based upon these issues.

The Division's agency notification letter (2008/Outgoing/0002.pdf) indicated the comment period would end on May 22, 2008 (not realizing how quickly the public notice would be published). Consequently, several more comments were received by May 22, including comments from the Southern Utah Wilderness Alliance, 13 southwestern region residents (Kanab, Cedar City, and unspecified), 4 Panguitch residents, 2 Hatch residents, and 2 Alton residents, all of whom were not in favor of the proposal. Three of

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these commenters requested an informal conference. In addition, the SUWA requested "Consulting Party Status" for cultural resource management.

Also received by May 22 was a supportive comment from one individual from the Southwestern region of Utah whose location was unidentified. In all 43 comments were received on or before May 22, 2008.

The Division has provided public notice in the Garfield County News and the Southern Utah News two weeks prior to the informal conference which was held on June 16, 2008 in Alton. (In addition, each commenter was notified individually of the conference.) Written findings from the Informal Conference were made on July 18, 2008 (2008\Outgoing\0024.pdf). The Findings require that the Division or County provide for another public hearing on the relocation of the County road to determine whether the public health and safety will be protected. A notice of temporary road closure was published in the Southern Utah News March 25, 2009 in accordance with R645-1-3-234, Suitability and the requirements of the July 18, 2008 Informal Conference Findings.

The Division has received comments with regard to this specific Coal Hollow application, for development of fee coal, from the following agencies:

- Powell Ranger District of the Dixie National Forest (2008/Incoming/0048.pdf)
The USFS Service expressed the same concerns as the community: that the area is of importance for tourism, that the traffic on SR 89 is made up of large recreational vehicles traveling to Bryce Canyon N.P., Zion N. P., and the Grand Canyon N.P; that the Class I air shed should not be degraded, since the night sky quality was part of the visitor experience and tourism makes up 60% of the economy.
- Office of Surface Mining (2006/Incoming/0008.pdf) stated that no federal mine plan approval was required.
- State Historic Preservation Office (2007/Incoming/0022.pdf)
The Division has been coordinating the UAC 9-9-404 review of this project with SHPO and has contracted with PLPCO for an archaeological review of the PAP.

The Governor's Resource Development Coordinating Council also had a public/agency comment period. The RDCC did not provide any comments to the Division.

Findings:

The information provided by the Applicant has met the requirements for public notification. The Division has fulfilled its requirement to include the public in the permitting process. Written findings from the Informal Conference were made on July 18, 2008 (2008\Outgoing\0024.pdf). A notice of temporary road closure was published in the Southern Utah News March 25, 2009 in accordance with R645-1-3-234, Suitability and the requirements of the July 18, 2008 Informal Conference Findings.

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FILING FEE

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

Analysis:

The \$5.00 fee was paid with the application.

Findings:

The Applicant has met the requirements of the filing fee.

PERMIT APPLICATION FORMAT AND CONTENTS

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

Analysis:

Appendix 1-6 contains a statement of the mine permit application's veracity and accuracy from Chris McCourt, the manager and resident agent for Alton Coal Development, LLC. The information provided is in a format prescribed by the Division.

Findings:

The information provided is either provided in a format prescribed by the Division and meets the requirements of R645-301-121.300 or a stipulation has been noted at the beginning of this TA

REPORTING OF TECHNICAL DATA

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

Analysis:

Analytical data is accompanied by the names of the individuals or firms responsible for collection and/or analysis of the data. A list of individuals and consulting firms contributing to the Mining and Reclamation Plan is found in Section 130.

Findings:

The information provided meets the requirements of the Utah Coal Rules.

MAPS AND PLANS

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

Analysis:

Maps of the permit area are provided on a scale of 1:6,000 (1" = 500 ft.) or less 1:1200 (1" = 100 ft). Maps of the adjacent area are provided on a scale of 1:24,000 (1" = 2,000 ft.), unless otherwise noted as a deficiency within this technical analysis. There are no previously mined areas within the currently proposed permit area (Sec. 521.110, p. 5-8).

The overburden removal sequence is shown on Dwgs 5 -16, 5-17, 5-18, and 5-19. The lower Robinson Creek diversion is shown on Dwg 5-20 (scale of 1:1200) and 5-21. The reclamation sequence is shown on Dwg 5-37 and 5-38 for the three year mine plan reclamation and on Dwgs 5-35 and 5-36 for the extended permit area scenario, requiring acquisition of the adjacent federal leases.

An unnumbered drawing included with the December 2008 submittal shows the Applicant's estimation of the extent of the adjacent area. "Adjacent area" is a defined term in R645-100, meaning the area outside the permit area where a resource or resources...are or reasonably could be adversely impacted by proposed coal mining and reclamation operations.

The Division is not, at this time, accepting or rejecting the Applicant's mapping of Adjacent Area designation, but will evaluate adjacent area under the probable hydrologic consequences and cumulative hydrologic consequences sections of this technical analysis. The adjacent area for other resources is discussed for each resource that could be adversely impacted.

Findings:

An unnumbered drawing included with the December 2008 submittal shows the Applicant's estimation of the extent of the adjacent area. "Adjacent area" is a defined term in R645-100, meaning the area outside the permit area where a resource or resources...are or reasonably could be adversely impacted by proposed coal mining and reclamation operations. The Division will evaluate the Applicant's adjacent area map and discuss adjacent area designation in the context of the Cumulative Hydrologic Consequences (CHIA) document.

COMPLETENESS

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

Analysis:

The first application was received on June 27, 2006 and was determined incomplete on August 22, 2006. The second application was received on June 14, 2007 and was determined incomplete on August 27, 2007. Supplemental information to the June 14, 2007 application was received on January 24, 2008. The Applicant was notified that the application package (combined information received June 14, 2007 and on January 24, 2008) was considered complete on March 14, 2008 (2008/Outgoing/0001.pdf and 0001a.pdf).

Findings:

The Applicant has met the completeness requirements.

ENVIRONMENTAL RESOURCE INFORMATION

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

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

Analysis:

Approximately 7,000 ft. elevation, gently sloping land vegetated with Utah juniper, pinyon pine, big sagebrush and wet meadows. Lower Robinson Creek (runs east west on the north of permit area). Sink Valley Wash (runs north south on the east of the permit area). There area several springs and agricultural ponds on eastern boundary of the proposed permit area. The average annual precipitation is 16.43 inches, evenly distributed throughout the year. The current and post mining land use is undeveloped rangeland (wildlife) and livestock pasture (grazing).

A description of the hydrologic environment of the Coal Hollow Mine site and surrounding area is provided in Section 721. Baseline information is presented in Section 724. The climatic conditions (App. 7-6), geology and hydrologic conditions (App. 7-1), groundwater and surface water resources, monitoring and evaluation (App. 7-4) document site conditions are shown in sections indicated.

In Section 724.700 the applicant refers to App. 7-4 for the 1988 Water Engineering and Technology, Inc., report titled "Geomorphological and Sedimentological Characteristics of Sink Valley, Kane County, Utah". The report is presented to substantiate the Applicant's claim that no continuous stream channels exist and therefore, no alluvial valley floor. Supplemental Alluvial Valley Floor information is presented in App. 7-7.

Water rights information is presented in App. 7-3 and shown on Drawing. 7-3. There are no domestic water supplies springs or wells in the proposed mine permit area. Water rights are detailed in Table 7-12. The operator correlates the water right with the monitoring site, owner, its source and typical flow range. An additional attribute in the table shows the dramatic difference between the water right amount and actual flow range. The applicant points out that the difference between the actual flows on and adjacent to the proposed mine and approved water rights amount are over a thousand gallons different per year.

The Probable Hydrologic Consequences PHC Determination is presented in Section 728 of the MRP.

Findings:

The information provided meets the requirements of the Rules for general resource information.

PERMIT AREA

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

Analysis:

In Section 112.500, the applicant provides a table that lists the permit area by the number of federal, state and fee acres. This permit area is shown on Dwg. 1-3 and 1-4. Mining is on fee land only. Section 116.100 provides a listing of the number of permit acres to be disturbed by mining in each phase (year) of the mining.

The Permit applicant re-submitted the following maps to utilize the following R645 Coal Mining Rules terminology, "permit boundary" and "permit area";

- a) Drawings 1-1 through 1-4
- b) Drawing 2-2
- c) Drawing 3-1 through 3-6
- d) Drawing 5-1, 5-2, 5-3, 5-9, 5-10, 5-13, 5-14, 5-15, 5-16, 5-16, 5-17, 5-18, 5-19, 5-20, 5-21, 5-22, 5-23, 5-25, 5-26, 5-27, 5-33, 5-34, 5-35, 5-36, 5-37, 5-38, 5-39
- e) Drawings 6-1, 6-2, 6-5, 6-9
- f) Plates 3 and 4 of App. 7-7 Report
- g) Drawings 7-1, 7-2, 7-3, 7-10, 7-12.

Kane County Road #136 and Road K3993 will remain under the jurisdiction of Kane County and same will be maintained by the County as a public road (See Appendix 1-7). The Kane County Road K3900 (136) Closure, Relocation and Replacement Agreement, Miscellaneous Provision C are contained on Page 7.

Findings:

The information provided in the proposed amendment is adequate to meet the requirements of this section.

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

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

Analysis:

The application for the Coal Hollow Mine includes the following cultural resource information (located in confidential files):

- 6/14/07 Cultural Resource Inventory
- 6/14/07 Paleontological Survey
- 6/14/07 Geologic Report of the impacts of Bedrock and Surgical Units on the Distribution of Cultural Resources at the Alton Coal Field
- 6/14/07 Data Recovery Plan for identified Cultural Resources
- 6/25/07 Revised Data Recovery Plan
- 1/9/08 Draft Outline of Cultural Resource Management Plan, CRMP
- 02/28/08 2nd Revision to Data Recovery Plan
- 02/28/08 Excavation Permit Application
- 03/14/08 CRMP
- 05/23/08 Revised CRMP

On November 2, 2007, the Division sent a letter to Dr. Matthew Seddon, State Historic Preservation Officer, requesting concurrence with the Division's determination and eligibility effect determination for the proposed Coal Hollow Mine. Dr. Seddon concurred with the Division's determination by way of correspondence dated November 20, 2007. However, because of adverse impacts and cumulative effects associated with the lease application on federal land, a Cultural Resource Management Plan, (CRMP) was developed in addition to the Data Recovery plan. To date several revisions to the Data Recovery plan and a Cultural Resource Management Plan, (CRMP); have been submitted to the Division for review and comment. The CRMP dated 05/23/08 and Data Recovery Plan dated 02/28/08 were the documents included in this review.

ENVIRONMENTAL RESOURCE INFORMATION

CRMP

Introduction – Page 1 – Because of the need for the CRMP to fully describe the entire project area and the complexity of the issues, this section had been expanded to fully describe the project area and cover the compliance needs of UDOGM, OSM, BLM, and other involved agencies. The additional information required to address these deficiencies noted in the CRMP was included in pages 1 through 3, of the revised CRMP and included:

1. *A description of the entire project area, making clear the distinctions between private, BLM, and transportation routes.*
2. *A description of the relevant laws (e.g. NEPA, Section 106, Utah Code 9-8-404, etc.) and how they apply to the project.*
 - a. *This description makes the necessary distinctions between directly and indirectly connected actions. Indirect effects, such as transportation are described here.*
 - b. *The involved agencies and their roles are described in this section.*
3. *The section notes that all involved agencies are aware that while not directly connected, the actions are related, and that therefore a comprehensive approach to Section 106 and Utah Code 9-8-404 compliance is being undertaken via this document.*
4. *A summary of the general cultural resources approach as described is included at the conclusion of this section, page 3, paragraph 2.*

Effectuated (sic) Environment – Page 1 on – This section has been revised to:

1. *Include the entire project area, including potential transportation routes, with maps, rather than focusing solely on the archaeology.*
2. *Provide a description of the compliance project and associated compliance issues.*
3. *Table 2 included other cultural resources such as the National Register of Historic Places Historic District in Panguitch.*

Description of Phases – Page 1 and Page 23-24

Each phase has been revised to supply data for the subsequent phases. This has been clarified in the current description on page 27 of the CRMP. Phase I is described as

“mitigation of immediate impacts,” and the descriptions are more clearly integrated with subsequent phases.

1. *In the introduction, these phases are clearly described with the relationships spelled out directly.*
2. *In the expanded discussion, the way the data from Phase I will tie to subsequent phases has been clarified.*
3. *Either in the CRMP or in the Data Recovery Plan clearly describe how sites x, y, & z (presumably all prehistoric) are expected to relate to the other sites in the BLM area – that is how do the Archaic sites in the private area compare to the Archaic sites in the BLM area and the Proto Historic private to BLM?*

Page 24, paragraphs 2 and 3 of the Data Recovery Plan describe how the prehistoric sites, Archaic, in the private area are expected to relate to the other sites in the BLM area – that is how the Archaic sites in the private area compare to the Archaic sites in the BLM area and the Proto Historic private to BLM.

Consequences of Project Phases, Phase II, Page 24 – As currently stated this reads, “Research would precede to Phase II, upon Alton Coal Development, LLC’s acquisition of federal coal managed by the Bureau of Land Management.”

Page 27, paragraph 2 of the revised CRMP states that *“Phase II and III cover the possible federal undertaking resulting from the lease of the Alton Coal Tract...”* This revised text is correctly stated.

Please clarify what the relationship is.

The text on Page 27, paragraph 2 through page 31 of the revised CRMP adequately clarifies the relationship of the project phases of the current private and possible future federal coal tracts.

DATA RECOVERY PLAN

Many of the comments on the original data recovery plan have been addressed. The review of the most recent Data Recovery Plan submitted on February 28, 2008 indicated that there were deficiencies that need to be addressed before the plan could be approved. They were outlined as follows:

Research Questions

As currently written, these research questions seem too broad for the collection of sites present. The comments on 12/18/2007 assumed that these questions would actually be for the CRMP where broad over-arching questions forming the context for site-specific research issues should be posed. In the case of these sites, the research questions are so broad that they probably cannot be addressed by the limited range of sites present and the limited work proposed.

The research questions need to be tailored specifically to the sites in question and for what they can address. Clearly describe how sites x, y, & z (presumably all prehistoric) are expected to relate to the other sites in the BLM area – that is how do the Archaic sites in the private area compare to the Archaic sites in the BLM area and the Proto Historic private to BLM.

The geomorphological element is key here especially for informing Phase II and III, but again, the real first or otherwise question here is what data do these sites really offer. Also, there aren't any Fremont/Anasazi sites in this phase – how will that inform later questions? Finally, what if the historic site (or the others for that matter) yield data that goes beyond the scope of your original questions? Will those sites proceed to the next phase?

Goal 2 of the original draft, surface and subsurface

This goal does not appear to be included in the current version of the Data Recovery Plan. It was highly relevant, and was suggested on 12/18/2008 that the question be refined a bit. It was stated that:

In terms of the surface/subsurface question, which we agreed was good and was at least partially met by the excellent random sampling strategy (a provision for expansion would probably cover most other areas); we suggested further clarification of what that question entails. Thus, instead of simply asking, "does the surface represent the subsurface," we recommended elaborating into all the related questions like "Do surface diagnostics reflect overall site dating?" "Are the functional interpretations derived from the surface assemblage supported by the subsurface assemblage?" "Does a site that appears to have significant data based on surface information have such data and what, if any, indicators in the surface assemblage suggest the presence of significant subsurface deposits?" "How much excavation is necessary in order to obtain a representative sample of subsurface artifacts?" "Can geomorphological evidence be effectively used to determine if the surface and subsurface assemblages are chronologically and functionally related?" And so on. Refining these questions may require slight refinements in the excavation/analysis approach.

Considering the relevancy in the first draft, it is also relevant for the second draft with some refinement. This question is perhaps the most relevant question that the current collection of the sites can address.

Page 25, paragraph 2 of the Data Recovery Plan describes how the surface and subsurface assemblages have been refined to include differences or similarities.

Curation

MOAC does not have a 2008 Provisional Repository Agreement (although the form has been submitted) with the Utah Museum of Natural History. Has MOAC contacted Kara Hurst, Registrar from the UMNH, and obtained an actual Repository Agreement?

For the phase I data recovery, there will need to be a legally executed, signed, transfer of title for the prehistoric artifact recovered from private land, which will grant title to the UMNH. Finally, an outline for how historic artifacts will be curated needs to be included.

This comment is intended as a reminder to the applicant. Page 40 paragraph 3 of the revised Data Recovery Plan includes a description of the curation methods for prehistoric materials. According to the interpretation of the information in this paragraph, a detailed field analysis will be conducted for historic period artifacts the applicant does not intend to collect historic materials.

The following comments and suggested changes pertain to the Federal portion or phase II of the CRMP. They need to be addressed prior to entering this phase of the CRMP. The applicant may chose to address these comments and suggested changes during this review process or prior to obtaining a SMCRA permit for additional federal activities.

CRMP

Consequences of Project Phases, Phase I, Page 23 (also, Phase III Page 24)

The description of the public involvement process on the bottom of this page and on the bottom of Page 24 does not meet the previous suggestions. In an email to the entire project team that was sent on 1/22/2008 it was stated that:

"Given the high public interest in this project, and the overall size of the potential effects, I recommend that the public be more involved than is usual (i.e. be more than simply the passive recipients of whatever mitigation project we archaeologists deem they are worthy of receiving). I suggest that planning for public input into the research design and excavation approach be established in the CRMP. Let's define "the public" based on the interested parties (more than just USAS, probably also

members of the towns of Alton and the surrounding area, tribes, as well as other citizens of the state). Let's then find out what the public are interested in learning and receiving from this project. It is their heritage; their interests should go right into the research design. The public should also be consulted early and often regarding "public mitigation products." We should not simply decide what they want out of it. The CRMP seems to be a good place for laying out a good process for both identifying the relevant public and defining meaningful consultation with that public."

As currently stated, public involvement has already determined that only USAS chapters are relevant. Furthermore, the public involvement occurs well into mitigation efforts and has already determined a particular public outcome. This does not meet the comments provided above. The CRMP needs to include a public involvement plan that:

1. Makes efforts to fully define and identify stakeholders (beyond USAS) who have interests in the cultural resources in this project area. This needs to start at the beginning of the project, not at Phase III (as suggested on Page 24). As currently stated, the Phase I public outcome has already been determined and the only open-ended input will be taken when Phase III is well underway.
2. Provides a process for incorporating public interests and desired mitigation outcomes into the decision of what public products will be part of the project.

In other words, we need to find the public, listen to what they want, weigh and consider the input, and then provide public output that meets those interests and not what a bunch of professional archaeologists think that some small segment of the public would want.

The following additional comments excerpted from Christopher Hansen's, SHPO, email to Matt Seddon on 5/7/08 are worth noting. As the project develops, they will be given consideration:

Right now, the historic district comes to mind (what does the NR nomination say about Panguitch and particularly Panguitch's Main Street, does it have character defining features that might be impacted by the intrusion of so many new trucks?), what about vibrations from the trucks--does UDOT or FHWA have any concrete studies? From what I recall Panguitch also had a Main Street program at one time too, clearly the historic character of their downtown has been an important asset to the community.

Overarching Research Design (Currently missing from CRMP)

In the email on 12/18/2007, Lori Hunsaker, PLPCO and Matthew Seddon, SHPO communicated that they:

... were initially confused about the relationship of the treatment plan to the agreed-upon CRMP. We now understand it as something that will be part of the overall CRMP, and the research design specified in the draft document will basically form the nucleus of the sections of the CRMP research design that cover non-diagnostic open-air lithic scatters and the historic research design.

Currently there is only a culture history, no research design in the CRMP. The CRMP will need an overarching research design prior to going into Phase II. Assuming that the research questions posed in the current Phase I treatment plan are the “nucleus” as discussed in the comments above, for the moment these could be inserted into the CRMP. However, prior to ultimate finalization of the CRMP, we have the following comments that we recommend be incorporated into this overarching research design:

Previous comments on a draft of this plan were provided in an email to the authors with copies to other team members on 12/18/2007. Comments are confined to areas where those previous comments appear to have not been addressed.

Research Domains and Questions – Pages 24 on – A reference to one portion of the Kern report (page 28), and a very general question about “how systems compare” to Coral Canyon, Quail Creek, and Sand Hollow sites (page 28) are included in this section of the CRMP. More refined research questions are required in order to make data recovery and subsequent research more efficient. Therefore, the following information needs to be incorporated into the Research Domains and Questions section of the CRMP:

Research Domains and Questions

The broader research design needs to incorporate the spate of recent work (e.g. Kern, Sand Hollow, HRA's work near St. George, Joel Janetski's work in Escalante) that provides refined research questions for the broader region and which are applicable to the Alton Amphitheater/Sink Valley area”.

Research Domain 1 – Chronology -

Berry, Chapter 27 in Kern Report Vol IV – Page 581 on Virgin Anasazi dating

Reed, Chapter 29 in Kern Report Vol IV, Page 601, summarized projectile point model could potentially be tested or data from project could be evaluated in terms of model.

Revised chronologies have been proposed by Seddon and Reed, Kern Report Vol VI, Chapter 1, as well as for the Archaic period Vol IV, Chapter 10. These models could be

proposed as testable or open to refutation or refinement with specific description of how the data from this area can be used for such issues.

Research Domain 2 – Site Function, Use History, and Artifact Distributions –

Chapter 11 of the BYU Sand Hollow report describes specific site functional types and models that could be evaluated. These types appear amenable to investigation or testing with data from the project sites.

Vol IV, Chapter 22 of the Kern report provides a detailed discussion of Southern Paiute site function and settlement organization and provides a limited test of the model. It seems that the large number of Southern Paiute sites in this project area could really help test this model if the research design were to explicitly consider this research.

Research Domain 3 – Subsistence and Environment

The Sand Hollow report Chapter 11, pages 422-426 provides a detailed discussion of Virgin Anasazi subsistence that can be used to provide more specific research questions.

The Sand Hollow report Chapter 11, pages 426-27 proposes that resource stress results in particular patterns of intensification that the large number of sites in the project area appear directly amenable to addressing.

The Sand Hollow report, Chapter 11, pages 428-434 (and referencing a significant body of work) examines questions of Southern Paiute horticulture that the large number of Late Prehistoric sites seem able to address.

The Sand Hollow report, Chapter 11, pages 435-439 proposes a model of post-contact Southern Paiute subsistence that the sites in the project area may be able to address.

The model of diachronic patterns in faunal exploitation in the Kern report, Vol IV, Chapter 30 and the model of diet breadth through time (Chapter 31) appear to provide fodder for relevant research questions. These questions can be much more refined than the very general questions posed in 3.2 of the draft report.

Research Domain 4 – Technology

The Kern report, Vol IV, Chapter 34 refines and defines a model of technology and mobility that can be used to develop more refined questions, particularly the conclusions on Page 683.

If thermal features are of interest, as suggested by question 4.2, the Kern report, Vol IV Chapter 9 provides a very explicit model of variation in thermal feature types over time that could be tested if features are found in the project area.

Models of pottery manufacture and mobility, such as Simms and Bright and the Kern report, Vol IV, Chapter 17, appear very relevant to this project area.

The Kern report, Vol IV Chapter 38, provides models of trends in ground stone technology that could be used to refine the ground stone technology issue questions (3.3 and to some degree 4.1)

Research Domain 5 – Settlement Patterns and Mobility

The Sand Hollow report, chapter 11, pages 441-443 provides a number of theoretical models (population packing, hinge points, Virgin Anasazi subsistence, etc.) that while applied in the Sand Hollow report to the St. George Basin do not seem irrelevant here and which could be adapted for this project.

Vol IV, Chapter 14 of the Kern report, while comparing Fremont and Virgin Anasazi settlement patterns does provide new models of Virgin Anasazi settlement type that could be explicitly examined via research questions based on the model.

Vol IV, Chapter 20 of the Kern report provides a model of Late Prehistoric demography that, given the long time span of the sites in the project area and the large number of Late Prehistoric sites, could be tested with data from the project area.

Given the large number of sites and time breadth in the project area, the issues raised in the model of land productivity and hunter gatherer settlement strategies in the Kern Report (Vol IV, Chapter 33) could be adapted or used as the basis for forming more refined questions than the ones currently posed.

Findings:

The information is adequate to meet the requirements of this section of the regulations. Approval from the PLPCO for the excavation of the following eligible sites was granted on July 11, 2008 and received by the Division on July 13, 2008. This approval included sites 42KA2042, 42KA2068, 42KA6104, 42KA6105, 42KA6106, 42KA6107 and 42KA6108. Approval from the PLPCO for the excavation of the following eligible site was granted on November 12, 2008 and received by the Division on November 13, 2008. This approval included sites 42KA2044. SHPO concurrence for this site was received by the Division on November 13, 2008.

CLIMATOLOGICAL RESOURCE INFORMATION

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

Analysis:

The application discusses the climatological factors representative of the proposed permit area in Section 724.400 and Appendix 7-1. Table 7-3 summarizes climatological information from the Alton weather station located approximately 2 miles north of the proposed mine: data were collected from 1928 to 2005. Drawing 7-8A presents the data graphically. The Applicant installed an automated weather station at the proposed mine site in December 2005. The station continuously measures and records temperature, wind velocity and direction, and precipitation, although the rain gauge is not operative in the winter. Drawing 7-8B plots daily maximum and minimum temperatures at the Coal Hollow Mine site for from January 2006 to May 2007. Appendix 7-6 contains climatological data for both the Alton and Coal Hollow weather stations. Speed and direction of prevailing winds at the proposed mine site are shown on rose diagrams in Figure 4 of Appendix 7-1.

The site has an average annual precipitation of 16.38 inches per year (Section 724.411). Wind data since 2005 are plotted in wind rose diagrams showing the average velocity (6 mph) and predominate direction (from the northeast) (Fig. 4, App. 7-1). Temperatures have been measured and summarized in Table 7-3.

Findings:

Climatological Resource Information in the application is adequate to meet the requirements of the Coal Mining Rules.

VEGETATION RESOURCE INFORMATION

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

Analysis:

Plant communities within the proposed permit area and reference areas are described in Vol. 2, Chap. 3. The descriptions include acreage, percent of total by community, total living cover, percent cover by shrubs, grasses, forbs and woody plant species, for;

- The proposed Disturbed Sagebrush/Grass Community
- The Sagebrush/Grass Reference Area
- The Proposed Disturbed Meadow (Dry) Community
- The Meadow (Dry) Reference Area

ENVIRONMENTAL RESOURCE INFORMATION

- The Proposed Disturbed Pinyon-Juniper Community
- The Pinyon-Juniper Reference Area
- The Proposed Disturbed Pasture Land Community
- The Pasture Land Reference Area
- The Proposed Disturbed Oak brush Community
- The Oak Brush Reference Area
- The Proposed Disturbed Meadow Community
- The Meadow Reference Area
- Other Meadow Communities

Tables 3-1 through 3-33 include living cover and frequency by plant species, total cover and composition and woody species density. Table 3-34 includes pounds per acre "biomass production" for each plant community.

Appendices 3-2 and 3-4 include the methodologies, maps, sampling design and transect/quadrat placement, cover and composition, woody species density, sample size and adequacy, statistical analyses, photographs and threatened and endangered plant species, results, summary and discussion and color photographs for the referenced communities.

Findings:

The information is adequate to predict the potential for re-establishing vegetation and the productivity of the land within the proposed permit area for surface coal mining and reclamation activities. The information 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:

Fish and Wildlife information for the permit and adjacent areas is included in Vol. 2, Chap. 3, Sec. 322. Agency consultation and studies conducted are listed on page 3-32 and 3-33. Site specific resource information as required by section R645-301-322.200 of the regulations is included in the confidential portion of the application.

Threatened, Endangered, and Candidate plant and animal species for Kane County are included in table 3-35. A brief narrative for each species describing surveys conducted to verify their presence (or the rationale for their absence) is included in the application in Table 3-35

ENVIRONMENTAL RESOURCE INFORMATION

High Value habitats for black bear, rocky mountain elk, mule deer, and sage grouse are described on page 3-35 of the application. In 2006 UDWR changed the terms utilized for habitat designations. The term "high-value" habitat are now designated as "crucial", and should be changed as such throughout the document. The information is derived from the DWR GIS database indicating that these four species occur within or adjacent to the proposed disturbed area. Additional information for the sage grouse is included in Appendices 3-1 and 3-3 and the text of chapter 3.

Chapter 1, appendix 1-7 contains the Environmental Assessment that addresses potential impacts associated with the relocation of the county road. The location of the road is depicted on drawing 5-3 contained in chapter five of the application. According to this drawing, the road does intercept a portion of the proposed adjacent area. The road will be used for the public and maintained with public funds; therefore, it is not considered an affected area under the R645 regulations. The BLM has analyzed the adjacent area affects of the county road realignment through the EA included in Appendix 1-7.

Maps and Aerial Photographs

Vegetation communities, reference areas are delineated on drawing 3-1. Drawings 3-2 through 3-5 include the habitat for the high value wildlife species, black bear, rocky mountain elk, mule deer, and sage grouse. Drawing 3-1 has been revised to include vegetation information pertaining to the county road realignment but does not include the proposed relocation of the county road. The wildlife habitats are depicted on drawings 3-2 through 3-6.

Findings:

The information is adequate to meet the requirements of this section 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 application includes a non-prime farmland determination by the National Resources Conservation Service in Appendix 2-1, Section 1). The Order II soil survey in Appendix 2-1 includes field description of soil pits, laboratory analysis of samples taken by horizon, and a soil map (Dwg 2-1). The soil survey classifies the soil into thirteen family map units. These map units are described in the text (Section 222.200) and representative pedons are provided for each unit. Sections Two and Three of Appendix 2-1 provide greater

detail on the classification and naming of the soils and the typifying pedons for the soils. Productivity estimates are provided in Section 321.200. Topsoil and subsoil will be salvaged for use in reclamation, no substitute or borrow soils will be needed.

Findings:

The information provided meets the requirements for baseline soil survey information as required by the R645 Coal Rules.

LAND-USE RESOURCE INFORMATION

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

Analysis:

Chapter 4, Section 410 describes the current land uses for the Coal Hollow project. They include zoning for agricultural use, grazing for livestock production, recreation, hunting and wildlife habitat. Drawing 1.3 describes the land status (private) of the proposed permit area. Land capability information is included on page 4-4 of Chapter 4. Chapter 3 describes land capability in terms of percent cover for the vegetative communities in the permit and adjacent areas. The application also includes a description of the land capability in terms of supporting livestock, 1.125 AUM's, (animal unit month) for the Pugh and Dames properties. A description of the existing and proposed post-mining land use is included in the following paragraphs:

The Management Plan for the Richard Dame Property

The current land use of Mr. Dame's property is forage for domestic livestock and some wildlife species. The land includes irrigated pasture for cattle and some horses, native stands of pinyon juniper and sage brush communities as noted on map 3-1, Vegetation. Mr. Dame's property will be returned to pasture land for domestic livestock with some plant species for wildlife habitat. Table 3-19 includes the seed mix, native and introduced grasses and forbs, to be planted to meet the landowner's request. A copy of the signed management plan is included in appendices 4-3 and 4-4.

The Management Plan for the Burton Pugh Property

The land owned by Mr. Pugh currently provides forage for livestock and some wildlife species as well. The land includes sub-irrigated pasture land, meadows, sagebrush/grass, pinyon juniper and oak brush communities as noted on map 3-1. The livestock on the property are mostly cattle and sometimes horses. Mr. Pugh's land will be restored to its original use for livestock grazing and wildlife habitat. The seed mix will

include plant species used by wildlife species in addition to native and introduced grasses. A portion of the property will be reclaimed to sage-grouse habitat as well. A copy of the signed management plan is included in appendices 4-3 and 4-4.

Findings:

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

ALLUVIAL VALLEY FLOORS

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

Analysis:

Alluvial Valley Floor Determination

The applicant has made a request for determination of alluvial valley floor for the proposed Coal Hollow Mine and Sink Valley Wash area. Appendix 7-7 contains Alluvial Valley Floor Supplemental Information, which was added to specifically address several questions raised by the Division during the Administrative Completeness review.

The applicant has provides a very good argument that the material that fills the Sink Valley floor is a colluvium instead of stream laid deposits identified in the requirements of the definition of alluvial valley floor. The applicant provides a report "Geomorphological and Sedimentological Characteristics of Sink Valley, Kane County, Utah" by Water Engineering and Technology (WET), Inc., 1988 argues that the sediment in Sink Valley is of course material in an alluvial fan laid down by unconfined sheet floods, debris flows and mud flows. The report claims there was never a continuous stream in Sink Valley. Thus, the definition that defines an alluvial valley floor in Sink Valley is not met

Background Information

The Alton/Sink Valley area was the subject of a much larger, mine permit application in 1982 and 1987 by Utah International Inc. (UII, P/025/003). The UII application included the Sink Valley area in T 39 S., R. 5 W. and surrounding federal leases in T. 39 S., R. 6 W.; T. 40 S., R. 4 W.; T. 40 S., R. 4 ½ W; T. 40 S., R. 5 W; and T. 40 S., R. 6 W. The federal leasing required an Environmental Impact Statement (Development of Coal Resources in Southern Utah, 1979). The Office of Surface Mining (OSM) commissioned a reconnaissance report of the alluvial valley characteristics of the Alton Area in 1980. The resulting report, by Jack Schmidt was titled, "Reconnaissance Determination of Alluvial Valley Floor Status and Assessment of Selected Geomorphic Parameters in selected Stream Valleys of the Alton

Petition Area and Adjoining Lands, Garfield and Kane Counties, Utah.” The Schmidt report details agricultural production, water rights and water diversions in the Alton amphitheater and Johnson Canyon at the time. (Jack Schmidt’s full 1980 report can be found at 025/0005/2006/Incoming/0012.pdf.)

In 1983, OSM mapped the Sink Valley alluvial valley floor (AVF) and stressed the importance of agricultural land use in making initial AVF determinations in the Colorado Plateau, in the absence of more typical geology associated with an alluvial valley in the Powder River Basin (OSM 1983 [draft] Alluvial Valley Floor Identification and Study Guidelines, Appendix D, pp. D-1,p.D-2, and D-6). OSM stated that agriculture “in its present form” could not exist in the region without alluvial valleys, therefore alluvial valleys do exist in the region. (p. D-4). OSM went on to suggest that an Applicant for a mine permit collect additional data to clarify the regional hydrologic pattern (p. D-1).

OSM was required to make specific detailed findings with regard to the protection of the hydrologic balance and reclamation during the processing of the UII Alton Mine permit application (which included tracts of federal leases) in response to petition and litigation in United States District Court for the District of Utah, Central Division (0250003/1987/Incoming/0040.pdf). The Court’s Memorandum of Decision and Order was dated February 12, 1985.

The February 8, 1988 Initial Completeness Review for the 1987 UII Alton Mine application indicates on page 34 that the following areas were identified as probable alluvial valley floors (filed as 0025/0003/1988/Incoming/0023.pdf):

1. Upper Skutumpah Creek, Sec. 20 and 29, T. 40 S., R. 4 1/2 W.
2. Skutumpah Creek, Sec. 30, T. 40 S., R. 4 ½ W.
3. Thompson Creek and Tributaries, Sec. 30 and 19, T. 40 S., R. 4 ½ W and Sec. 24, 13, 12, T. 40 S., R. 5 W.
4. Bald Knoll Hollow, Sec. 14, 15 and 16, T. 40 S., R. 5 W.

The Division further stated in the Initial Completeness Review on page 35 that the following areas had been “positively” determined to be Alluvial Valley Floors:

1. Skutumpah Creek in Sec. 32, T. 40. S., R. 4½ W. and Sec. 5 and 6 in T. 41 S., R. 4½ W.
2. Thompson Creek in Sec. 31, T. 40 S., R. 4½ W. and Section 6 in T.41 S., R.4½ W.
3. Upper Sink Valley Wash in Sec. 32, T. 39 S., R. 5 W. and Sections 5 and 8 in T. 40 S. R. 5 W.
4. Sink Valley in Sections 19, 20, 29, and 30, T. 39 S., R. 5 W.
5. Lower Swapp Hollow in Sec. 28, T. 39 S., R. 5 W.
6. Kanab Creek in Section 18, 24, 25, 26, and 36, T. 39 S., R. 5 W.

7. Alton Amphitheater in Sec. 6 and 7, T. 39 S., R. 5W. and Sec. 1, 11, 12, and 13 in T. 39S. R. 6W.

The Coal Hollow proposed permit area encompasses the Sink Valley in Section 19, 20, 29 and 30 in T. 39 S., R. 5 W.

The Division's 1988 decision was based on borehole data showing sorted deposits of sand size or larger particles and previously published information, as laid out in a memo from Richard Smith, Geologist, to John Whitehead, Permit Supervisor, dated November 9, 1987 (025/0003/1987/Internal/0002.pdf).

The UII commissioned Water Engineering Technology, Inc. (WET) of Fort Collins, CO to evaluate the Sink Valley area. The 1988 WET report, titled "Geomorphological and Sedimentological Characteristics of Sink Valley, Kane County, Utah" argued that the sediment in Sink Valley is comprised of coarse material in an alluvial fan laid down by unconfined sheet floods, debris flows and mud flows. The report claims there was never a continuous stream in Sink Valley, thus, by R645-100 definition, a lack of a continuous stream channel meant an alluvial valley floor in Sink Valley could not exist.

The Division was not persuaded by the WET report. To the contrary, Richard Smith, Division Geologist, viewed the WET report as further evidence of unconsolidated stream-laid deposits holding streams and reported as much to the Division Associate Director, Ken May, on October 13, 1988. His memo cited near surface deposits of sand sized particles, selectively sorted, and deposited within and adjacent to stream channels, as well as the presence of smooth land surfaces and channels exceeding 3.0 ft. wide X 0.5 ft. deep within Sink Valley, and the established agricultural land use, for a positive determination of an alluvial valley floor in Sink Valley (0250003/1988/Internal/0001.pdf).

In December 1988, Nevada Electric Investment Company (NEICO, a partner in UII) petitioned the Board of Oil, Gas and Mining for review of the Division's AVF determination. At the present time, no record has been located of the outcome of that petition, and there is reason to believe the cause was never heard before the Board. NEICO's assertions that Sink Valley is not an AVF are, in brief, that Sink Valley does not contain a continuous stream, the unconsolidated alluvia do not have the characteristics of streamlaid deposits, and there is no floodplain – terrace complex because the processes need to form them did not and do not exist in Sink Valley: these are similar to the arguments made in the current Coal Hollow Mine application.

Current Coal Hollow Mine Application

The Alluvial Valley Floor determination for the current Coal Hollow Mine application has been reviewed by Division. .

The 2008 Coal Hollow Mine application includes the WET 1988 investigation in Appendix 7-4; current reconnaissance by Peterson Hydrologic Inc. in Appendices 7-1; and Alluvial Valley Floor Supplemental Information in Appendix 7-7 that specifically addresses land use, soils, vegetation and hydrologic questions raised by the Division during the 2007 Administrative Completeness review.

In the discussion below, the Division evaluates the application for information pertinent to R645-302-321, in order to make a determination of the extent of any alluvial valley floor within the proposed permit area and adjacent area, per R645-302-321.300. The applicable R645 Rules are used to organize the discussion.

R645-302-321.210 Mapping of Unconsolidated Streamlaid Deposits Holding Streams

Appendices 7-1 and 7-4 refer to the definition of "alluvial valley floor" in the R645-100 Rules that exclude from an alluvial valley floor all "upland areas...composed chiefly of debris from sheet erosion, deposits formed by unconcentrated runoff ...or other mass movement accumulations..." The term, "upland areas" is also defined in R645-100 and means, "those geomorphic features located outside the floodplain and terrace complex, such as isolated higher terraces, alluvial fans..."

The applicant states that no flood plains or stream terrace deposits were identified in the project area, the flood plain and terraces could not be mapped.. The Applicant found no evidence of flood plain and terrace features that are characteristic of alluvial valley floors (App. 7-7, pp. 4-5) and suggests that coalesced alluvial fans form the surface of Sink Hollow Wash (App. 7-7, pp. 2-3). This position is strongly supported by the information presented in Appendix 7-4, the WET Report.

The Applicant suggests the lack of continuous channel is indicative of an alluvial fan due to deposition by mud flows, sheet floods, and debris flow, but also that the lack of a continuous channel may be partly due to human activity (construction of diversions, ponds). The Applicant refers to Plate 1 in App. 7-7 that shows numerous discontinuous channels but no continuous channel in Sink Valley Wash. The Division notes the discontinuous channels shown on Plate 1 seem to coincide with the historically developed pastureland shown on Dwg 3-1. If the ponds that have been constructed in the channel are taken into account, it is evident that Sink Valley Wash is a continuous channel from its origin in Section 21 Canyon and to the east of the Johnson Ranch; however, in the NW/4 of Section 32, the channel dissipates and the flow is spread across the surface as overland flow, which has been described by the Applicant.

Drawing 7-3, indicates continuous point-to-point diversions along the length of the Sink Valley Wash channel and the USGS Alton Topographic Quad shows a continuous channel for Sink Valley Wash. Figure 19, App. 7-1, shows the tributaries to Sink Valley. The figure and several maps show a stream channel in Sink Valley. The Division has also

observed that the channel shown on the USGS Alton Topographic Quad and evident on the ground is a feature superimposed on the alluvial fan. It has not created a floodplain; it originates near the head of the fan in Section 21 Canyon, where sheetwash collects into rills and channels, and is augmented by flow from Swapp Hollow and several smaller drainages.

Sink Valley has the appearance of an alluvial valley floor, because it once contained a continuous stream channel, which deposited alluvial stream laden sediments. There are undoubtedly both colluvial and stream laid deposits in Sink Valley from past geomorphic activity. After reviewing the information in the PAP and the WET report the Division concludes it's likely that both alluvial and colluvial systems operated to form large alluvial fans in Sink Valley. In the middle and below Swapp Hollow the streams running from the fan combine to form an alluvial channel down Sink Valley. The stream flows that enter the valley in the early spring are now captured and dispersed along the valley via ponds and diversions. The aerial photograph of Plate 4 shows the surface features in Sink Valley, including the alluvial fan at the upper end of the valley. Most of the main channel has been covered in the past by farming activity, leaving a series of ponds that outline the channel. If the streamflow to the valley were significant, the channel would most likely have been left intact.

Plate 2 shows the surface water drainage patterns, and Drawing 7-7 shows stream patterns. Some of the runoff from Water Canyon is diverted to Robinson Creek while the rest of the water including that from Section 21 Canyon infiltrates into the alluvial fan at the upper end of Sink Valley. It is believed that the finer alluvial that has built up in the middle of Sink Valley as it filled with sediment material retards the groundwater flow in the eastern and western sides of the valley.

On October 1 and 2, 2008, Division personnel examined the area for AVF characteristics. They determined that upper Sink Valley Wash, where the mine is proposed, consists of alluvial fan deposits, with no floodplain and terrace complex. There was no consensus as to whether or not there is a continuous channel, even when the impacts of human modifications are accounted for. Surface flow was a very small trickle into the some of the ponds in the channel. Although some characteristics of an AVF are present (see definitions for both "Alluvial Valley Floor" and "Upland Areas" in R645-100-200, i.e., unconsolidated stream-laid deposits and agricultural activity supported by irrigation and subirrigation), not all characteristics listed in the definitions in the Coal Mining Rules are clearly present, i.e., stream-laid deposits holding streams with water availability sufficient for irrigation or subirrigation agricultural activities. There is water available for subirrigation and irrigation, but the "stream" through Sink Valley Wash is not the source of the water.

Subirrigation and agricultural activity also occurs on the edges of Sink Valley where groundwater flows through colluvial deposits from the adjacent hillsides: the amount of this flow is unknown. By definition these conditions do not constitute an AVF. Any interruption

of the colluvial sediments might lessen flow to the alluvial sediments, but no mining is planned in or near these colluvial materials

The Applicant plans to mine in the vicinity of the springs and groundwater resource flowing through the colluvium. The Applicant has submitted water rights data to identify any spring and well with state appropriated waters that may have to be replaced.

The ground water supply from Robinson, Water, Section 21 Canons and Swapp Hollow recharge the springs in Sink Valley as well as the deep groundwater system and alluvial stream laid deposits. Recharge to the alluvial sediments could also come from the deep system. As mentioned, the stream-laid deposits are less porous and have less transmissivity than the colluvial deposits. From the WET Report it is interpreted that the stream-laid deposits range along the eastern to middle part of Sink Valley beginning below Swapp Hollow and continue to the lower canyon of Sink Valley. The sedimentary structure of Sink Valley Wash consists of colluvium and alluvial fans deposited by unconcentrated runoff, and there is no floodplain and terrace complex.

In Appendix 7-4, the application describes the origins of Sink Valley through the burial of Tropic Shale by Wasatch sediments brought down from adjacent canyons (Robinson, Dry Creek, Sec. 21 Canyon and Swapp Hollow) and the eventual lowering of Robinson Creek, which siphoned off a portion of the Sink Valley flow, creating a residual alluvial fan bordered by a Tropic Shale ridge. The shale ridge blocks subsurface flow of groundwater to the west, bringing the shallow groundwater system to the surface on the eastern boundary of the permit area as evidenced by numerous seeps and springs shown on Dwg. 7-1 (pp.7-3 and 7-4 Sec. 721, Chap. 7). These seeps and springs either sub-irrigate the lands within, east, and south of the permit area or they fill ponds for domestic, stockwatering, irrigation, or wildlife uses (Table 1, App. 7-1 & App. 7-3). This area is generally represented by groundwater discharge area A on Dwg. 7-4.

The Applicant describes a preferential pathway for alluvial groundwater flow through deep coarse-grained alluvial sediments along the east side of Sink Valley, outside the proposed permit area (Chap. 7, Section 721, 728 p. 7-26). This deep water was tapped at artesian wells Y-102, Y-61, Y-59, and C5 (Fig. 13, App. 7-7). The deeper groundwater system is in communication with wells SS at the south end of the permit area, where data from SS wells provides evidence of a 15-foot thick, highly permeable stratum located 60 to 75 feet below the surface (Chap 7, Sec. 727, p. 7-27 and App. 7-1, Table 8). The application states that this coarse stratum is in contact with the artesian groundwater system found in Section 29, east of the proposed permit boundary, and that groundwater recharge to the lower half of the Sink Valley sediments occurs via horizontal migration. Artesian wells were also noted to the south of the permit area in Section 32 (Chap 7, Sec. 721, p. 7-5). This area is generally represented by groundwater discharge area B on Dwg. 7-4.

The depth of the water bearing coarse strata in well SS (App. 7-1, Table 8) corresponds with the top of the coal elevation shown on Dwg. 6-5 at the SS well location (which is not on drawing 6-5). Thus the coal seam, that is 200 feet below the surface at the mouth of Swapp Hollow (App. 7-1, Table 5, Well 36) may be in contact with the artesian water in surrounding wells that are screened at depths 62 to 142 feet below the surface (App. 7-1, Table 5). Alternatively, the Tropic Shale (which forms a barrier to water movement in the northern part of the permit area) thins to the south of the permit area and becomes less of an impedance to vertical water flow between the alluvium and the coal to the south of the permit area. The application indicates that flow through the deep, coarse fragments provides better quality, water emanating from SP 32, south of the permit area (Chap. 7, Section 721, p. 7-8). The same strata would likely be responsible for the flows into Sink Valley at SP4 and SP 27 at the contact with the Dakota formation (just below the coal seam).

A small amount of flow (5 – 10 gpm) emanates in the channel at the coal seam as a spring to Robinson Creek in the northwest end of the permit area (Chap 7, Sec. 721, p. 7-6). While the coal seam is reported to have low transmissivity at Y-38 and Y-36 locations (Chap 7, Sec. 721, p. 7-4), the SS-75 well had high transmissivity (Table 7-8). Clearly the groundwater contained in this coarse stratum does not provide flow at SW 6 or SW 9 in the lower Sink Valley stream channel. These stream monitoring locations flow in response to snowmelt and precipitation events (Chap. 7, Table 4).

The direction of shallow groundwater flow is shown in Figure 21 of App. 7-1. Dwg. 7-13 shows local saturation levels in the alluvium of Sink Valley, but does not represent a potentiometric surface. Alluvial ground water is present in confined piezometers at depths of two to twenty feet within the proposed permit area (Table 1, App. 7-7). Unconfined water is evidenced by the numerous springs shown on Dwg. 7-1. The Applicant concluded that the distance between the monitoring wells and the perched, discontinuous nature of the saturated zones did not allow extrapolation of the potentiometric data for the entire permit area (App. 7-7, Sec. 2.6). The Applicant also concluded that an isopach map of the depth to saturation, based on the soils pits and shallow exploration bore holes, was not possible because a continuous, saturated ground-water system was not found (App. 7-7, pp. 7- 8). The Division notes that Table 2, App. 7-7 indicates depth to ground water in soil pits was between one and six feet on the eastern side of the permit area and between four and ten feet in the center of the permit area.

Figure 8, App. 7-1 illustrates the geology in cross-section. Figure 8, App. 7-7 shows the streams, ponds, springs, and well locations in relation to surface geology, as well as the projected location of the pits and permit boundary.

The Applicant states that Kanab Creek and its tributaries are downcutting. Robinson Creek, the only continuous channel in the Sink Valley Wash area, is deeply incised and appears to be actively downcutting. The Division notes that Appendix D of the 1983 OSM AVF Guidelines acknowledges the entrenched stream courses (p. D-4) and states that the

central question becomes, what valleys have the capability to be irrigated?" (p. D-8). The OSM AVF assessment assumes water can be "transported to any terrace level, providing that a part of that level had historically been irrigated" (p. D-8). The more important issue is water availability (p. D-9).

The information provided indicates that there is not the typical terrace and stream channel geomorphology or a defined continuous channel in Sink Valley. The application describes a locally important artesian water source that is stratigraphically above the coal seam.

R645-302-321.220 Mapping of Agricultural Lands

The application describes shallow groundwater sources that provide subirrigation east of the Sink Valley Fault within the permit area, for agricultural activity on C. Burton Pugh's and Richard L. and Alicia S. Dame's meadowlands shown on Dwg. 3-1, and immediately east of the permit area for Darlynn and Arlene Sorensen's meadowlands and pasture shown on Dwg. 3-1. In addition, Sorensen's diversion structures are in place and irrigation can be implemented in high water years immediately east of the permit area. Pugh's irrigation diversion structures are in disrepair. Dame's irrigation structures are not shown. Johnson's irrigation ditches are not shown.

App 7-7, Sec. 4.1 through 4.3 provides a description of the agricultural use of lands within and adjacent to the permit area by cattle and for crop production. The locations of existing undeveloped rangeland, subirrigated lands, crop lands and pastures are shown on Drawing 3-1 and Drawing 7-7. There are 69 acres of meadow, 192 acres of pasture, 215 acres of sagebrush/grass land and 40 acres of oak brush, and 114 acres of pinyon /juniper in the permit area (un-numbered Table, Sec. 321.100, Chap. 3, p. 3-3). Dry meadow acreage is described in Section 311.100, but the acreage was not calculated. The Division estimates the dry meadow acreage to be twenty acres. Meadow, pasture and oak brush are by far the most productive lands with production estimated (not measured) at between 1,100 to 2,000 lbs/acre (Table 3-34, Sec. 321.100, Chap. 3).

Grazing lands supported by numerous seeps and springs dominate the proposed permit area as shown in Chap 4, Ex. 4.1. Acreage used for pasture was not provided for Pugh or Dames lands, although one can estimate based upon the information in Section 321.100 described above that there are 261 acres of meadow and pasture. Production estimates for the meadow are 1 Ton/acre. The value of supreme to premium dairy quality alfalfa hay would be on the order of \$130/Ton, based upon the Utah Department of Agriculture's February 27, 2009 (<http://ag.utah.gov/news/publications/reports.html>). Therefore, the value for the crop produced by 69 subirrigated meadow acres within the permit area would be \$8,970 annually. The unirrigated pasture land within the permit area has half the productivity and would have a crop value of \$12,980 annually. Cropland is illustrated on Ex. 4.1 east of the proposed

permit area. Acreage under production is given as 90 acres. The value of this cropland owned by Sorenson is discussed under the next section heading below.

Drawing 7-1 shows the total number of seeps and springs in the permit area available for grazing animals. Drawing 7-7 shows the ponds and ditches developed to support agriculture. Both Pugh and Dame own lands designated pastureland or subirrigated meadow lands within the permit area that have been leased to Alton Coal Development (Dwg. 3-1 and 7-7). These subirrigated lands are grazed to produce cattle, but are not cultivated to produce crops (Appendix 7-1, p. 48).

There are surface water rights along Sink Valley. The locations of these stream reach water rights are identified on Plate 7-3, Water Rights.

Allocated water rights in Utah frequently exceed the amount of water actually available, so the number of cattle indicated by water rights (750) is probably much greater than what the area actually supported. Appendix 7-3 indicates that within and east of the permit area, within Sections 19, 20 and 30, Pugh holds three of eight water rights on stream reaches in Lower Robinson Creek with total allocations for 750 stock unit diversion limit. The BLM holds two additional water rights in Sec 19 and 20 that are allocated for stockwater for the Cecil Pugh grazing allotment No. 39, with a total of 26 stock unit diversion limit. Heaton's have a water right just upstream of the BLM water right in Sec. 20, also for stock watering (1,600 stock unit diversion limit). Adjacent to the permit area, the BLM holds a water right in Sec 25 on Robinson Creek allocated for stockwater for Sharon Lamb grazing allotment No. 38, with a total of 18 stock units. The Lambs hold an additional water right in Sec 25 for stockwatering of 60 stock units.

Further upstream (east) from the permit area, Pugh and Sorensen also hold water rights on a reach of Right Hand Wash, in Sec 21, for 250 and 300 stock units, respectively.

Sorensen holds a water right on the stream in Sink Valley wash. Swapp and Lamb hold water rights on reaches of Kanab Creek for stockwatering, with a combined 460 stock diversion limit.

Mr. Pugh's father won a prize for the highest yield of potatoes per acre (825 bushels) in 1917 by irrigating a one-acre plot, but from the affidavits from C. Burton and Roger Pugh in Chapter 1, Exhibits 1 and 2, it appears potatoes were not a regular crop. The Pughs dry farmed oats and wheat with limited success in the 1950's. Flood irrigation was used for a small vegetable garden, and when sufficient water was available, approximately 5 acres of pasture was flood irrigated. The Pughs used ditches, ponds, and pipes to irrigate, bringing water from as far as upper Robinson Creek

East of the permit area, Darlynn Sorensen currently produces hay on 154 acres at the mouth of Swapp Hollow (Appendix 7-1, p. 48). Production from the Sorensen field varies by

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water year from 2,000 to 6,000 bales of hay (80 lbs each). This equates to 80 to 240 Tons of hay. The value of supreme to premium dairy quality alfalfa hay would be on the order of \$130/Ton, based upon the Utah Department of Agriculture's February 27, 2009 (<http://ag.utah.gov/news/publications/reports.html>). At \$130/Ton, the Sorensen's annual crop value would therefore be between \$10,400 and \$31,200. Irrigation typically was a single flood application in the spring, when adequate water was available (App. 7-7, p. 13). During a site visit in the fall of 2008, the Division noted that the Sorensen's had increased the acreage of cultivated land in Swapp Hollow.

The information provided indicates that subirrigated meadow currently supports limited agricultural activity within the permit area. Both Pugh and Dame own pastureland or subirrigated meadow lands within the permit area that have been leased to Alton Coal Development (Dwg. 3-1 and 7-7). These subirrigated lands are grazed to produce cattle, but are not cultivated to produce crops (Appendix 7-1, p. 48). Meadow and croplands east, west and south of the permit area support larger agricultural operations.

R645-302-321.230 Mapping of Current or Historic Flood Irrigated Lands

The Division notes that Appendix D of the 1983 OSM AVF Guidelines acknowledges the topography does not fit the typical flood plain and terrace system, but that the topography is suitable for irrigation. The topography has a gentle slope of 1 – 5% in Soil Map Unit 7 and 3 – 8% in Map Units 1 and 4 (Section 222.300 and Dwg. 2-1). The Sorensens hold three surface diversion rights in Right Hand Wash to irrigate 104.6 acres in the W ½ of Sections 29 and 32. Sorensens hold one water right for surface diversion on Swapp Canyon Creek and four water rights for surface diversions on Sink Valley Wash for irrigation of a combined 42.4 acres in the W ½ of Sections 29 and 32. In total the Sorensens hold water rights for the irrigation of approximately 143 acres in the W ½ of Sections 29 and 32 and stockwater for 300 units.

Johnson has one surface water right on Sink Valley Wash for the irrigation of 9.0 acres and stockwater for 125 stock units.

The application acknowledges the land is suitable for flood irrigation and that lands have been historically irrigated but that water availability limits the potential for irrigation (Chap. 7, Sec. 728, p. 7-3). Irrigation has not occurred within the proposed permit area for the last 10 years (p. 48, App. 7-1), but a defunct system of water distribution does exist for the Pugh property. Dame retains water for flood irrigation by the active water rights on Pond 29-3 and 29-5 (Dwg 7-7). Much of the Dame property is subirrigated and apparently needs no supplemental irrigation.

Table 2, App. 7-7 indicates depth to groundwater in soil pits was between one and six feet on the eastern side of the permit area and between four and ten feet in the center of the permit area, allowing for sub-irrigation of meadows and pastures. East of the permit area, the

flow from Swapp Hollow provides an average discharge of 55 gpm or an annual yield of 88.7 acre-feet (App. 7-7, Sec. 6.1.1). Flow from Swapp Hollow is retained in pond 29-1 (Dwg. 7-7).

Drawing 7-7 identifies flood irrigated and subirrigated lands, ditches that have been used for irrigation, and ponds that were probably part of irrigation systems. The Applicant states in Section 728.334, that limited use of spring discharge water for irrigation has occurred in Sink Valley but that (other than some yard watering at the Swapp Ranch house) such irrigation is not occurring presently nor has it occurred in at least the past 10 years. One reason given for the decline in agricultural activity is the lack of reliable quantities of water (App 7-7, p. 13). Water monitoring conducted between 2005 and 2007 shows no appreciable difference from the 1987-88 data. The Palmer Hydrologic Index (Figure 2, App. 7-1) indicates that there were several years of drought in the past decade that would have limited irrigation. The decline in flood irrigation in Sink Valley is not only due to limited water availability and but also to the effort required in comparison to the results (App 7-7, pp. 13-14). During a site visit in October 2008 the Division noted pipes on Pugh lands were corroded and cracked at the collection point and disconnected along their length from holding Pond 20-1. In addition, source waters from Water Canyon on USFS lands had left the stream channel and were lost in overland flow before reaching the collection point. Despite a lack of irrigation, the Division noted 35 cattle grazing subirrigated Pugh lands on October 1, 2008.

Appendix 7-7 describes the general construction and use of the water holding ponds. There are few conveyance systems between ponds; all conveyance systems in the area are indicated on Drawing 7-7. The conveyance systems consist of earthen ditches.

Stockwatering is the use stated on most of the water right printouts in Appendix 7-3, but most spring and surface-diversion rights in the W/2 of Sec. 29, E/2 of Sec 30, and W/2 of Sec. 32, T. 39 S., R. 5 W., along Sink Valley Wash around and downstream of the Swapp Ranch, either cover both stockwatering and irrigation or are for irrigation only. Ponds are used for stockwatering and irrigation systems (App. 7-7, p. 14).

Within the proposed permit area there is one spring with a domestic water right, SP-7 (Pugh, water right 85-215), located right along the fence between Pugh's and Dame's properties (Dwg. 7-3). Adjacent to the permit area, there are two springs with a domestic water right: SP-3 (Sorensen, water right 85-373), and SP-10B (Johnson, water right 85-1011).

Meadowlands shown on Dwg 3-1 are dominated by sedges, rushes and wild iris; are subirrigated; and the depth to alluvial groundwater is within "inches to a few feet below the ground surface" (App. 7-7, p. 10). Depths to ground water in the pasturelands vary seasonally from within one or two feet to several feet below the surface (App. 7-7, p. 12 and Table 1).

The Pugh lands were formerly irrigated using ditches, ponds, and pipes to bring water from as far as upper Robinson Creek (discussion with C. Burton Pugh in September 2005). Today, pasture lands in the permit area, dominated by introduced grass species, rely on precipitation (average approximately 16 in/yr) and stored soil moisture for growth and not on irrigation or subirrigation (App. 7-7, p. 12). The Division notes that Dame's pasturelands may be subirrigated by the active water rights on Pond 29-3 and 29-5 (Dwg. 7-7).

Irrigation structures are shown on Dwg. 7-7. Darlynn Sorensen currently uses flood irrigation for hay or grain production on his property at the south end of Sink Hollow Wash (Dwg. 7-7). Irrigation typically has been a single flood application in the spring, when adequate water was available (App. 7-7, p. 13). During a site visit in the fall of 2008, the Division noted that Sorensen's pond 29-1 was receiving a steady flow through the Swapp Hollow ditch and that Swapp Creek was dry as a result. The water depth in Pond 29-1 was 6 – 8 inches. In the fall of 2008 Sorensen had cultivated the slopes around Pond 29-1, increasing the acreage of cultivated land in Swapp Hollow from that currently shown on Figure 4-1. (Figure 4-1 outlines croplands; Drawing 7-7 is titled Ponds, Ditches, Subirrigated and Flood Irrigated Lands, it outlines the flood irrigated lands in red, but doesn't outline cultivated acreage.)

The Applicant has shown that the agricultural use of the land within the permit area has declined on Pugh lands. Pond 20-1 was formerly used to irrigate pasturelands in the SW $\frac{1}{4}$ Sec 20 with water diverted from Water Canyon (several miles upstream). The applicant has shown that Pugh's subirrigated meadows in NW $\frac{1}{4}$ Sec 29 and Dame's flood irrigated and subirrigated meadows in the W $\frac{1}{2}$ Sec. 29 currently support grazing.

Adjacent to the permit area, Sorensen has an active agricultural operation with lands that are subirrigated and irrigated. There are 154 acres of Sorensen's irrigated lands east of the permit area (App. 7-1, p. 48). The Applicant states that irrigation is variable depending on water availability. South of the permit area, the Sorenson pasture lands in NW $\frac{1}{4}$ Sec 32 were evaluated by the use of auger in August 2009 and were determined not to be subirrigated, but dependent on rainfall and pond seepage for irrigation.

West of the permit area, lands are irrigated with water taken from Kanab Creek (Plate 5, App. 7-7; Water Rights App. 7-3).

Landowners James Lloyd and Julie Johnson Brinkerhoff stated to the Division on September 24, 2009 that their pastures in Section 32 were subirrigated, see inspection report # 2151.

R645-302-321.240 Documentation of Subirrigation

There are 260 acres of meadowland and pastureland within the proposed 653 acre permit area (table on p. 3.3, Chap. 3 and Dwg. 3-1). Dwg. 3-1 outlines 69 acres of

meadowlands within the permit area that are dominated by sedges, rushes and wild iris and are subirrigated: the depth to alluvial groundwater is within "inches to a few feet below the ground surface" (App. 7-7, p. 10). These communities are all on the east side of the proposed permit area and they are all fed by numerous springs shown on Dwg. 7-1. Small acreages of meadow are located west of County Road 136 in Section 30. There are 192 acres of pasturelands within the permit area, where depth to groundwater varies seasonally from within one or two feet to several feet below the surface (App. 7-7, p. 12 and Table 1).

The information provided indicates a substantial area of subirrigated meadow and potentially irrigated pastureland east of the Tropic Shale Ridge (in the proposed permit area and eastward) and to the south of the permit area on Sorenson land. The area is outlined on Plate 7-7 received January 24, 2008. The subirrigated area was reduced in size after an auger evaluation conducted on August 15, 2009 (Plate 7-7 received 8/27/2009). The Division has compared the infrared imagery in Plates 3 and 4 and concludes that adequate soil moisture is present during the growing season to provide subirrigation for pasture in R. 5 W. T. 39 S. Sections 20 and 29. The growing season at this 6,900 ft. elevation averages 110 frost free days, with the last frost occurring on or about June 5 and the first frost occurring on or about September 24, according to Kevin Heaton, USU Extension Service (personal communication on 10/15/2009).

Soils in Map Unit 7 are wet. These soils are mapped on Dwg. 2-1 and their location correlates with the subirrigated lands shown on Dwg. 7-7. The July 15, 2007 infrared, aerial photo shows the moisture in Soil Map Unit #7 as red areas (Plate 4, App. 7-7). Map Units 6 and 13 have localized areas of subirrigation, including the approximately 20 acres of dry meadows shown in Plate 3-1 on the west side of County Road 136. The Applicant states that the representation of subirrigated lands on Dwg. 7-7 does not include these dry meadows that may also be subirrigated (pp. 10 and 12, App. 7-7). Depth to ground water within these meadows and pastures is provided in App. 7-7, Section 3.4, p. 10. The Applicant points out in App. 7-7, Sec. 2.6 that potentiometric data from piezometers (Table 1) does not represent shallow ground water conditions which are logged in Table 2 for the many soil pit locations shown on Figure 5 of App. 7-7. Together, Table 2 and figure 5 report that depth to water is between 50 and 120 inches in Sections 19 and 20 (T39 S, R5 W) and between 14 and 30 inches below the surface in Section 29 at the mouth of Swapp Hollow and between 60 and 80 inches in the E ½ S 1/4 of Section 30 on the southern most portion of the permit area. Depth to groundwater becomes very shallow again as one approaches Johnson Spring (shown on Dwg 7-2). Landowners James Lloyd and Julie Johnson Brinkerhoff stated to the Division on September 24, 2009 that their pastures in Section 32 were subirrigated, see inspection report # 2151.

Soil mottling confirms subirrigation in plant communities (App. 7-7, Figure 10). The meadow and dry meadow plant communities grow where soils are sub-irrigated. App. 7-7 Section 5.4.4 refers to table 7 that identifies the characteristics of the meadow and dry

meadow plant communities. App. 7-7 Section 6.4 states that "the topographic characteristics of most lands within the project area are compatible with flood irrigation techniques," and pasture land in the proposed permit area has the potential for subirrigation. In fact, Figure 10, App. 7-7 indicates that fine roots in all plant communities extend between 50 and 80 inches below the surface (with the exception of the very shallow pinyon/juniper community). The deepest rooted community is the Oak Brush at 80 inches. The shallowest rooted is the meadow community at 50 inches. The shallow rooting depth likely correlates to the availability of water.

Water Rights

Ten springs, with a combined total flow of approximately 23 gpm are allocated through water rights as follows from App. 7-3. Allocated water rights on these springs, approximately 1,300 gpm, greatly exceed the amount of water available, which is typical for water rights in many areas of the state.

Pugh holds water right 85-214 on Tater Patch Spring (SP 1) in NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec 19, flowing at 0.33 cfs for irrigation of 0.6 acres and water for 250 stock units. Pugh also holds water right 85-215 on Spring House Spring (SP-7), flowing at 0.007 cfs for domestic use and stockwatering of 250 stock units.

Dame holds four water rights on springs for irrigation of 93 acres in the NW, NE, SW, and SE quarters of Sec. 29 and water for 125 stock units [Swapp Ranch Spring No. 1 (SP 2; water right 85-350), flowing at 1 cfs; Swapp Ranch Spring No. 2 (SP 5; water right 85-351), flowing at 0.25 cfs; Swapp Ranch Spring No. 3 (SP-6; water right 85-352), flowing at 0.25 cfs; and Swapp Ranch Spring Area No. 4 (SP 8; water right 85-353), flowing at 1.0 cfs].

Sorensen has water right 85-373 on the Sorensen Ranch Spring No. 1 (SP 3), in the NE $\frac{1}{4}$ NW $\frac{1}{4}$ of Sec. 29, flowing at 0.011 cfs for use as domestic water and sole supply for stock watering for 300 stock units; water right 85-374 on the Sorensen Ranch Spring No. 2 (SP-4), in the SE $\frac{1}{4}$ NW $\frac{1}{4}$ of Sec. 29, flowing at 0.011 cfs, stock watering; and water right 85-375 on Sorensen Ranch Spring No. 3 (SP 9), in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 32, flowing at 0.022 cfs for stockwatering.

Johnson has water right 85-355 on Pulsifer Spring (SP 10A and SP10B) in the SW $\frac{1}{4}$ NW $\frac{1}{4}$ and the NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 32, flowing at 31.725 acre/ft/yr for irrigation of 4.82 and 125 stock units; and a segregated 0.9 ac/ft/yr for domestic use flowing from the same spring (SP10B).

The information provided indicates a substantial area of subirrigated meadow and potentially irrigated pastureland east of the Tropic Shale Ridge (in the proposed permit area and eastward) and to the south of the permit area on Sorensen land..

R645-301-321-250 Documentation of Water Quality and Yield, Stream Flow, Soil Characteristics, and Topography Affecting Flood Irrigation Potential

Locations of springs and seeps identified in the Coal Hollow Project spring and seep survey are listed in Table 1 of sub-Appendix B of Appendix 7-1. Table 1 lists 33 seeps and springs, 28 of which flow from the alluvium. Drawing 7-1 and Plate 1 of sub-Appendix B of Appendix 7-1 show the springs and seeps in or immediately adjacent to the proposed permit area: 10 are within or on the proposed permit boundary. Table 3 and Figure 9 of Appendix 7-7 provide the water quality information of springs SP6 and SP8 (locations on Figure 8 of Appendix 7-7), which respectively represent the south and north subirrigated lands shown on Dwg 7-7. App 7-7 Section 5.2 compares water quality with Figure B-5 in the OSM, 1983 Alluvial Valley Floor Identification and Study Guidelines for irrigation water suitability. The spring water that is subirrigating lands in the permit area is Class 2 (medium salinity hazard, but not sodic) in the northern permit area, but degrades to Class 3 (high salinity hazard, not sodic) in the southern permit area. Stiff Diagrams on Figure 14 App. 7-1 (Peterson Report, June 12, 2007) show this change in water quality. The Division noted that water quality in the southern permit area has improved considerably between 1987-88 sampling and 2005 sampling, perhaps due to less grazing pressure or less agricultural activity.

Table 9 in App. 7-7 provides discharge and water quality data for selected surface water monitoring locations that are shown on Dwg. 7-2: Section 21 Canyon drainage (SW 7); Upper reach of Swapp Hollow (SW 8); Left Fork of Sink Valley (SW 6); (left) Dry Fork of Robinson Creek (SW 4); Lower Robinson Creek near the confluence with Kanab Creek (SW 5); Robinson Creek at the location where it is to be re-routed within the proposed permit area (SW 101); and Water Canyon (RID-1) . The Division notes that Sink Valley is monitored at SW 6, in a location that does not receive flow from the eastern canyons. The monitoring point SW 4 and the monitoring point for Water Canyon (RID-1) can be seen in relation to the Water Canyon diversion to the Pugh pasture, as shown on Plate 7-7.

Swapp Hollow water is medium salinity, with low sodium hazard, suitable for most plants. Swapp Hollow Creek has the best potential to support flood irrigation. The Applicant states that the average instantaneous discharge measured for Swapp Hollow Creek is 55 gpm. Calculated annual yield is 88.7 acre-feet, which would irrigate approximately 24 acres of alfalfa or 33 acres of pastureland using an earthen ditch distribution system (App. 7-7, Sec. 6.1.1 and Table 9).

Lower Robinson Creek, Dry Canyon, Section 21 drainage, Upper Water Canyon spring diversion, Sink Valley Wash, and alluvial ground water discharges have less potential

to support flood irrigation. The Applicant states the flow volumes are low and inconsistent. Water Canyon spring has good quality water. Water quality of the other potential sources is not discussed, mainly because analyses are sparse due to no-flow conditions.

Pond 29-3 on Richard Dame's property is fed by groundwater from an alluvial spring. Surface water collects downstream in pond 29-5, also on the Dame property (p. 14, Sec. 4.2, App. 7-7).

The Sorenson's flood irrigated croplands are outlined on Dwg 7-7. The Sorenson property is just east of the permit area (Dwg 1-3). App. 7-7 Sec. 4.1 relates that ponds 29-1 and 29-2, as well as the ponds 29-6, 29-4, 29-7, 29-8, 29-9 [that function as a series of overflow ponds down the Sink Valley drainage] and pond 32-1 are all on Sorenson property. Of the Sorenson's ponds, only pond 29-7 is equipped with an outlet control structure for irrigation.

A portion of the Pugh property is subirrigated, the rest was flood irrigated with a diversion Water Canyon (Dwg 7-7). Pond 20-1 is located on the Pugh property and it is equipped with an outlet control structure for irrigation (Sec. 4-2, App. 7-7). There was no water in the pond in the fall of 2008 and the supply pipe was disconnected.

The information provided indicates that the terrain is suitable for irrigation, but that irrigation is not required to produce meadowlands and pasture. When available, irrigation doubles yield. Water quality data indicate that there may be enough water to flood irrigate small areas, and that the quality of water from shallow alluvial groundwater is sufficient to raise alfalfa or other grasses for hay crops and pasture. Groundwater from the deeper portions of Sink Valley to the east in Section 32 are part of a larger, more continuous groundwater system" that is of better quality than the shallow groundwater (pp. 7-8 Chapter 7.)

The volume of water to be encountered during mining is related in Chapter 7, Section 727, p. 7-21. The Applicant states that the average discharge from all springs in Groundwater Area A (shown on Dwg. 7-4) sums to 35 gpm. The average discharge from all springs in Groundwater Area B sums to 17 gpm. If mining causes material damage to all springs, 52 gpm replacement water would be required.

The application states that there could be as much as 200 gpm entering the open pit at the south end of the permit area in the vicinity of well SS (App. 7-7, p. 35 and Chap 7, Table 8).

R645-302-321-260 Analysis of Aerial Photography Showing Seasonal Difference between Valley and Upland Vegetation.

Appendix 7-7 provides two aerial photographs of the valley floor. Plate 3 provides infrared imagery that was flown in July 15, 2006. Plate 4 provides imagery that was flown November 2, 2007. The applicant has labeled areas of wet meadow and wet pasture, and this vegetation type was described in the application. Acreages are provided in a table on p. 3.3, Chap. 3 and are also shown on Dwg. 3-1). The Division has compared the infrared imagery in Plates 3 and 4 and concludes that adequate soil moisture is present during the growing season to provide subirrigation for pasture in R. 5 W. T. 39 S. Sections 20 and 29. The growing season at this 6,900 ft. elevation averages 110 frost free days, with the last frost occurring on or about June 5 and the first frost occurring on or about September 24, according to Kevin Heaton, USU Extension Service (personal communication on 10/15/2009).

Information on the ground water found in the geotechnical boreholes (Appendix 5-1) has been included in the discussion of ground water and seasonal variation in App. 7-7 (p. 7). Figure 6a and associated cross-sections provide a schematic representation of the thickness of the alluvium, stratigraphy, and depth to ground water at monitoring locations. Seasonal variation in alluvial water levels is portrayed in hydrographs in Figure 3 and on Table 1 of App. 7-7. Variation of the depth to groundwater and aquic conditions in the alluvial sediments, as observed in the soils pits, is provided in Table 2 and Figure 5 of App. 7-7. The information on groundwater depths is summarized in Figures 13 and 14 of App. 7-7.

On the average, depth to groundwater in wells east and south of the permit area is 4.5 feet and within the permit area it is 9 feet (Fig. 13, App. 7-7). Immediately east of the permit area, the head in artesian wells rises an average of 15 ft. above ground. Minimal seasonal variation in wells within the permit area and in the artesian flow is presented in Fig. 14, App. 7-7. Groundwater wells east and south of the permit area have a seasonal variation of four feet on the average. Seasonal variation in alluvial water levels was not related to vegetation changes (App. 7-7, p. 8), but was reported to be just below the surface at the beginning of the growing season, falling to a couple feet below the surface at the end of the growing season (App. 7-7, p. 10). Seasonal variability of springs outside of the permit area was referenced on p. 11, App. 7-7. The applicant noted no specific correlation between seasonal variations of water levels and vegetation changes.

Adjacent Area

The Division is required to protect adjacent areas designated as alluvial valley floors, as per R645-302-320 and R645-302-322. Adjacent area is a defined term and means the area outside of the permit area where a resource or resources are or reasonably could be expected to be adversely impacted by the proposed coal mining and reclamation. As applied to an AVF determination, the adjacent area should include areas where there are characteristics used to evaluate the AVF and particularly areas where the hydrologic regime may be affected by the mining and consequently may affect an AVF.

Figure 3 of Appendix D of the 1983 OSM Alluvial Valley Floor Determination Guideline shows potential Alluvial Valley Floors that were identified during a reconnaissance survey of the Alton Coal Field.

The Applicant mapped the existence of probable alluvial valley floors along Kanab Creek and lower Sink valley (Plate 5, App. 7-7). The probable Kanab AVF was supported by the existence of irrigation structures, ponds and agricultural cattle production (Section 9.1, Appendix 7-7). The probable Lower Sink Valley Wash AVF is downstream of the flood irrigated or subirrigated areas in Swapp Hollow and Sink Valley and was designated because it is a topographic valley holding a continuous stream channel; there is the probable existence of stream laid deposits in the subsurface; and the land area appears capable of being flood irrigated based on topography.(Section 9.2, Appendix 7-7).

App. 7-7, Sec. 9.0 discusses the designation of probable adjacent alluvial valley floor areas along Kanab Creek and lower Sink valley based upon visual observations and the location of irrigation diversions and pond structures. The extent of these probable alluvial valley floors has not been documented for either the Kanab or Sink Valley probable alluvial valley floors, but they are not within the permit or adjacent areas of the Coal Hollow Mine, so there has been no assessment of water quality or quantity.

The December 18, 2008 application included an outline of the adjacent area to show areas where hydrology regime may be affected by the mining. As drawn, the adjacent area includes Lower Robinson Creek, Sink Valley and the mouth of Swapp Hollow. As applied to the AVF determination, this adjacent area map indicates the probable alluvial valley floors shown on Plate 5, App. 7-7 (Kanab Creek and lower Sink Valley) are beyond the probable hydrologic impact of the Coal Hollow Mine.

Agricultural production in a segment of the probable Kanab Creek alluvial valley floor was described in Section 8.0 of App. 7-7 as 200 acres of pasture or hay that yields approximately 1 Tons/acre. The value of supreme to premium dairy quality alfalfa hay would be on the order of \$130/Ton, based upon the Utah Department of Agriculture's February 27, 2009 (<http://ag.utah.gov/news/publications/reports.html>). The total annual value of the Lamb hay crop would be approximately \$26,000.00. This figure does not include the \$13,000.00 value of the after-crop grazing (estimated on p. 33 of App. 7-7 to be ½ Ton/acre)

The application does not discuss agricultural activity of the Johnson-Brinkerhoff operation, immediately upstream of the probable alluvial valley floor shown on Plate 5 of Appendix 7-7.in There is no agricultural use in the first three-quarter mile of the probable alluvial valley floor in Lower Sink Valley Wash as shown on Plate 5 and discussed in Section 9.0. The Bald Knoll, Utah, USGS 7.5 minute topographic map shows the Lower Sink Valley stream channel continuing south five miles to the confluence with Kanab Creek. The Division photographed the confluence on September 24, 2009 and noted that the

confluence was saturated, but there was no surface flow. Sink Valley receives tributary waters approximately every mile along its way to the confluence with Kanab Creek. Division personnel have observed the entire reach down to the confluence with Kanab Creek and have concluded that conditions noted in Appendix 7-7 continue to the confluence, and that this area is not an AVF.

On July 20, 2009 Eric Peterson, Peterson Hydrologic provided comments for ACD establishing their point-of-view for stating there is no alluvial valley floor in Sink Valley. Under the OSM Guidelines, flood plains and terraces underlain by alluvial deposits, together with adjacent side slopes composed of alluvial material, may be identified as potential AVF lands when they lie within a topographic valley containing a continuous perennial intermittent or ephemeral stream. The two necessary elements are a continuous stream and flood plain/terrace landforms underlain by alluvium. Side slopes within a topographic valley are only potential AVF's if they are adjacent to eligible flood plain/terrain and if they are underlain by alluvium. If either the flood plain/terrace terrain complex or side slopes are composed of colluvial deposits, no AVF is Present and if they are underlain by alluvium. If either a continuous stream or flood plain/terrace landform is absent, no AVF can be found regardless of the presence of alluvial side slopes. In the recent Peterson analysis, the Sink Valley area does not contain a flood plain and terrace complex and cannot be an AVF under the Division's rules or the OSM Guidelines.

On October 1, and 2, 2008 and recently, on September 23 and 24, 2009 Division personnel to evaluate the sink valley area for AVF characteristics. A large group of people met on October 1 and 2, 2008. Several features in Sink Valley provide a basis for calling the valley an AVF. Remnants of an old stream channel, subirrigated fields in the western have of Section 29, agricultural crops. Sink Valley has a unique setting. Determining if it meets the requirements of an AVF is a fine judgment call of definitions and interpretations. Ie, does an abandon stream channel that no longer transmits flows still count as an continuous stream channel. The recent evaluation considered all input from many disciplines and reports. The extent of mass movement was considered in the initial review, but was not supported in favor of the stream channel seen in aerial photographs. ACD pointed out regulations, specifically R645-302-321. The first part of the regulation states that unconsolidated stream laid deposits are a prerequisite for an AVF. It goes on to indicate that upland areas composed chiefly of debris from sheet erosion deposits form by unconcentrated runoff, or other mass movement accumulations are specifically excluded from the AVF definition in the rules. Mr. Peterson pointed out the term upland areas means those geomorphic features located outside the floodplain and terrace complex, such as isolated higher terraces, alluvial fans. The rules indicate that upland areas containing cannot be and AVF.

The field investigation of September 23 and 24, 2009 included Division personnel, Jim Smith, April Abate and David Darby. The trip was to evaluate the alluvial fan that had previously been identified by the group during the October 1 and 2, 2008 field trip. The

three started just above the Jones' pond area and hiked up the west edge of Sink Valley and east of the Sorensen road.

Hiking along the shale ridge, it was observed that the fields in the western part of the valley were not necessarily wet but did grow sedges, rosehip plants and a couple horsetail plants, a good indication of moisture at the surface throughout the year. Cattle were grazing in the fields. The group noted 3 springs where cattle watered. The alluvial fan could be seen filling the valley looking eastward from the ridge. Looking up the valley toward the canyons, the steep gradient of the alluvial fan could be seen. Alluvial material has filled along the shale ridge so that some flows from surface saturation have overflowed the ridge. Sedges can be seen growing in these areas. The group hiked up the canyon in the direction of Water Canyon by the road. Looking across the canyon the slope of the alluvial fan was clearly visible. Hiking across the fan, old runoff channels could be seen. There was no flow in any of the channels, including Robinson Creek that has cut down into the alluvium more than 20 feet. It appeared that there was still a lot of alluvium below the bottom of the creek channel. At one point up the canyon the group observed an old channel where Robinson Creek flowed south over the alluvial fan towards Sink Valley. Below the old channel Robinson is very tight for a stream channel. It has been pondered if Robinson Creek was once diverted away from Sink Valley to get more water to Kanab. No one seems to know.

Determining the extent of the alluvial fan in Sink Valley is a call that had to be made, using the best judgment and information available. A stream channel once existed in the valley but does not function today. All flows to the valley occur during the spring runoff or during storms. Water flowing from the canyons contain high concentrations of suspended solids. Considering the extensive area of the Robinson and Swapp Hollow water sheds one can get a good idea of the amount of debris that can be produced during large storm events.

The subirrigation that takes place throughout the valley is from water flowing from the alluvial fan. The discharge from all the springs in Sink Valley is in the vicinity of 60 gpm, somewhat more than the recharge from the springs in Water Canyon. The supply of water to the two wet areas described by the applicant are from groundwater. Evapotranspiration accounts for the water loss because there is rarely any surface water leaving Sink Valley. The farming conducted by Sorensens is not subirrigated. In a phone conversation with Mrs. Sorensen on September 22, 2009, she stated that they usually harvested only one crop of hay in the spring, and there was no irrigation provided to the farmed lands.

Air photographs taken from Google Earth show the topography of the alluvial fan. They also show areas in Sink Valley where rivulets flowed from the alluvial fan over time creating finger like structures as flows eroded the base of the fan.

The field visit was valuable in revealing there is now no functioning stream channel, there are no stream laid deposits in Sink Valley that are sub-irrigated and the alluvial fan

forms the entire valley to where it narrows. According to definitions and the requirements of R645-302-321, there are no areas on the proposed mine permit or Sink Valley that constitute an alluvial valley floor.

The applicant proposed a potential AVF below the wider valley of Sink Valley. The site was evaluated on September 23, 2009 to assess its potential. It is not clear if the site was ever farmed, there is no farming currently being conducted. The channel running through the site is deeply incised, about 25 to 30 feet. No water was flowing in the channel and no irrigation of any type is taking place. The group determined the site is not an AVF.

The applicant addresses the characteristics of an AVF at the confluence of Robinson and Kanab Creeks but does not specifically classify them as alluvial valley floors. A search of previous review documents indicated an area in Section 25 along Kanab Creek is irrigated from a source of water in Kanab Creek diverted at Section 24. The area is incised and even though it may contain alluvial gravels, the soils are not subirrigated. The field investigation of September 23, 2009 observed the site along Kanab Creek designated a potential AVF. The site is grazed, has alluvial terraces and a stream that was flowing at the time of the field visit. It did not appear there was active farming, but some farming or earth leveling had taken place in the past.

Findings:

In accordance with R645-302-321.300, the Division finds that the defining geological characteristics are not present for an alluvial valley floor within or adjacent to the permit area. (See Utah Coal Mining Rules R645-100-200 for definitions of "Alluvial Valley Floor" and "Upland Areas.")

- **Agriculture**

The agricultural component of the alluvial valley floor determination is present. There is water available and sufficient to support agriculture and domestic use east of the Tropic Shale Ridge and South in Sink Valley Wash.

- **Geology**

The Upper Sink Valley Wash, where the mine is proposed, consists of alluvial fan deposits, with no floodplain and terrace complex.

- **Hydrology**

There is water available for subirrigation and irrigation, but the "stream" through Sink Valley Wash is not the source of the water. Subirrigation and agricultural activity also occurs on the edges of Sink Valley where groundwater flows through colluvial deposits from the adjacent hillsides.

By definition, these conditions do not constitute an AVF.

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Information in the submittal is sufficient for the Division to determine that:

- 1) there is no AVF in Sink Valley in and adjacent to the proposed Coal Hollow Mine;
- 2) the AVF in Kanab Creek will not be affected by the mine; and
- 3) the area south of the proposed Coal Hollow Mine, identified by the Applicant as the lower Sink Valley Wash probable AVF , has no potential for irrigation or subirrigation and is not an AVF.

PRIME FARMLAND

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

Analysis:

The Natural Resources Conservation Service evaluated the soils of the proposed permit area for prime farmland status in the fall of 2006. The NRCS concluded that there were no prime farmland soils in the permit area, however soils on slopes less than 14 percent could qualify a Soils of Statewide Importance, if irrigated (Appendix 2-1, Tab 6 and M:0250005\2006\Incoming\0011.pdf).

The land has historically been used for agriculture. App 7-1, p. 9, provides a description of the agricultural use of lands within and adjacent to the permit area by cattle and for crop production. The agricultural use description includes a reference to maps, Drawing 3-1 in Chapter 3 and Drawing 7-7 in Chapter 7 that show the locations of existing undeveloped rangeland, subirrigated lands, crop lands and pastures. The Applicant states that the representation of subirrigated lands on Dwg. 7-7 does not include approximately 20 acres of dry meadows shown in Plate 3-1 on the west side of County Road 136. These dry meadows may also be subirrigated (pp. 10 and 12, App. 7-7).

Both landowners, Pugh and Dame, have leased to Alton Coal Development, LLC., lands within the permit area that are designated pastureland or subirrigated meadow lands (Dwg. 3-1 and 7-7). Mr. Pugh's father won a prize for the highest yield of potatoes per acre (825 bushels) in 1917 by irrigating a one-acre plot, but from the affidavits from C. Burton and Roger Pugh in Chapter 1, Exhibits 1 and 2, it appears potatoes were not a regular crop. The Pughs dry farmed oats and wheat with limited success in the 1950's. Flood irrigation was used for a small vegetable garden, and when sufficient water was available, approximately 5 acres of pasture was flood irrigated. The Pughs used ditches, ponds, and pipes to irrigate, bringing water from as far as upper Robinson Creek. How long the Pugh lands have been out of production is not known.

Within the permit area, Richard Dame's property is designated pasture land (Dwg 3-1). Dame runs cattle on his property (personal communication with Richard Dame, September 6, 2006).

Appendix 7-7, Sec. 4.1 describes irrigation and pastureland outside of the permit area.

Findings:

The Division, in consultation with the NRCS, finds that there are no prime farmlands in the permit area.

GEOLOGIC RESOURCE INFORMATION

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

Analysis:

Chapters 6 and 7 address the probable hydrological consequences and requirements for geologic resource information as required by rules R645-301- 623 and 724. The Applicant compiled, evaluated and presented a description of the regional and local geology. The application contains updates to the plates depicting the geologic conditions within and adjacent to the proposed mine area. A Utah Geological Survey publication, Geologic map of Alton Quadrangle, Kane County, Utah (2001) by Terry L. Tilton is included in the MRP. The report provides a good description of the geology of Sink Valley and the adjacent hills where mining will take place. The publication contains maps and cross-sections showing the stratigraphy and structure of the area around the minesite.

Mining will take place in the Smirl coal seam. The coal zone sits at the top of the Dakota Formation and below the Tropic Shale. The Tropic shale is about 700 feet thick. The strata in the region of the mine dip toward the north and north-east from 1 to 5 degrees. In Sink Valley the lower layers of the Tropic Shale remain. It has been broken and tilted to form hills surrounding Sink Valley. The Tropic Shale consists of expansive gray and carbonaceous silty shale and claystone. Information obtained from drilling indicates that the lower 200 to 250 feet of the formation consists of fairly uniform soft, dark gray, silty shale or thinly bedded claystone with occasional thin lenses of siltstone and occasional layers of bentonite-like clay. Where streams flow on the Tropic shale, steep sided arroyos have been cut by erosion along main streams and lateral gullies. Sink Valley is filled with alluvial and colluvial material. These Quaternary deposits include pediment alluvium, landslide deposits, mass wasting debris, and alluvial fan deposits.

Appendix 7-4 contains a report by Water Engineering and Technology, Inc., (September 1988), which describes the geomorphology and sediment characteristics of Sink Valley.

Sink Valley is a broad, low area, where flowing (artesian) springs create wetlands or fens, in some areas of the valley. Plate 2 shows the surface drainages in the vicinity of Sink

Valley and the proposed Coal Hollow Mine. Sink Valley Fault bisects the mine permit area from north to south. The Applicant estimates the offset of the fault is 10 to 30 feet, with the west side lower than the east side. Mining will come in contact with the fault. There is no connection between the fault and the hydrologic system. The Bald Knoll Fault runs north-south, it lies substantially east of the mine permit area and has no influence on the mine hydrology.

Acid and Toxic Materials

The information on acid and toxic forming materials is presented in Section 623.100 and 728.320. The applicant is required R645-301-624.220 and 624.230 to collect and analyze for the potential of acid and toxic forming materials in the geological strata above, below and in the coal seam. The information is required to assess the potential for contamination of surface and groundwater by the overburden removal.

The applicant conducted a drilling program to collect cuttings and cores in 2005. Sediment, bedrock and coal samples were collected from seven locations within the project area for analysis of acid and toxic forming potential. A drill hole location map and analytic information are provided in Appendix 6-2. Samples were analyzed for texture, pH, EC, SAR, % lime, water extractable boron, total metals (including selenium), and acid base accounting. High levels of iron (>5,000 ppm) are accompanied by high pH values (> 8.6) and high SAR values (> 35) in the overburden. The overburden is not rich in carbonates and presents limited neutralization potential, with some layers containing < 50 tons calcium carbonate per kiloton of overburden. The overburden having high SAR and/or pH will have to be selectively placed to minimize the potential of salt contamination, refer to deficiency written under R645-301-731.300.

The coal seam pH values range from 5.5 to 7. The coal will be removed from the pit and stored on the surface for a limited time before being sold. Runoff from the coal storage site will be controlled and treated.

The Division received several comments that suggested coal transported from the Coal Hollow mine site could contaminate the rivers and streams if it falls along the roadside, and then is washed into the streams. The Division will forward such comments to agencies that have jurisdiction, such as the Utah Department of Transportation and to the State Highway Patrol.

One commenter suggested that the MRP should include baseline hydrologic information for the distance from the coal mine to the loadout in Cedar City. Baseline information is collected for the "adjacent area" that might be adversely affected by "coal mining and reclamation operations" as defined in R645-100-200. For the purposes of geologic information, the baseline must include adequate information for an alluvial valley floor determination.

Findings:

The application meets the Geologic Resource Information requirements. The Applicant will be required to monitor for selenium where water leaves the minesite, during operational and reclamation phases.

HYDROLOGIC RESOURCE INFORMATION

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

Analysis:

Water Rights

Water rights of springs and surface claims are described in Section 731.800 of the PAP and illustrated in Table 7-12. The applicant provides information in Appendix 7-3 and identifies the locations on Drawing 7-3. The Division conducted a search of the water rights in the Sink Valley area to ensure all water rights are being monitored. The search found that all water rights on and adjacent to the mine have been identified by the applicant. From previous technical reviews it may appear that some water rights are not listed in Table 7-12, however water rights such as 85-363, 85-364 and 85-365 are accounted for in the stream diversion water right 85-366 filed for the surface and ground water rights. The applicant reported that an application had been submitted for well 85-760 (Sorensen Well), but was rejected by the Division of Water Rights. Sorensen still uses water from a spring (SP-40), hand carried to the house.

Water Right 85-377 is not a well as mentioned in the previous TA. The site is a surface water source on a stream. The site has been included in the water rights table.

Sampling and Analysis

The Applicant states that water sampling and analysis have been and will be conducted according to the methodology in the current edition of "Standard Methods for the Examination of Water and Wastewater" or the methodology in 40 CFR Parts 136 and 434 (Section 723).

Baseline Information

Petersen Hydrologic conducted a spring and seep survey in 2005 and 2006. UTM coordinates and basic parameters for identified sites are listed in Appendix B of Appendix 7-

1. Locations are plotted on a USGS topographic base map in that same appendix: the area covered by the primary seep and spring survey is identified on Drawing 7-1.

The Applicant has included baseline springs, wells, and stream monitoring points on Drawing 7-2. Drawing 7-10 shows the operational monitoring locations – streams, springs, and wells - that are listed in Table 7-5. Drawing 7-12 is described as showing the locations of monitoring wells in the proposed Coal Hollow permit and adjacent area, and it shows all the wells listed in Table 7-5 except for Y-98 because the drawing does not extend far enough to the northeast to include Y-98. Drawing 7-12 also includes four wells (C-6, C-8, 7-59, and Y-99) that were used in previous studies to collect baseline data on the alluvial groundwater system: data for these four wells are in the Division's database, but these wells are not included in the operational monitoring plan. Figure 12 of Appendix 7-1 also shows locations for monitoring wells, with the map symbols signifying whether the well monitors water in the coal seam or alluvium: Y-36, Y-38, and Y-45 are the coal seam wells the Applicant plans to monitor (Table 7-5). Coal-seam monitoring wells Y-39, Y-40, Y-41, Y-43, Y-49 and Y-53 and alluvium monitoring wells Y-50 and Y-62 are shown on Figure 12 but on no other map; no data for these wells have been submitted to the Division's database but potentiometric data from the 1980s are in Table 13 of Appendix 7-1.

The applicant has provided a baseline groundwater monitoring plan in Chapter 7, Section 724.100 and again in Appendix 7-1 in the Peterson Hydrologic Report (PHR). An Operation and Reclamation monitoring plan is provided in Section 730, which is based on the PHC.

The Applicant has conducted baseline monitoring for surface and ground water resources on and adjacent to the proposed mine. Table 7-1 presents the location, source and use of baseline monitoring stations. Table 7-5 shows the hydrologic monitoring locations for surface and groundwater sites, and assigns the protocols for monitoring parameters and frequencies. Table 7-4 defines the monitoring protocols. Table 7-6 identifies the list of field and laboratory parameters to be monitored quarterly at surface baseline sites. Table 7-7 identifies the list of field and laboratory parameters to be monitored quarterly at groundwater baseline sites.

Spring and stream flow data and well level information from surveys conducted in 1987 and 1988 by Utah International have been provided. The Division's database contains baseline data collected quarterly by the Applicant between February 2005 and February 2009, and data collection is ongoing. Although data are missing for some quarters at certain sites, the data are sufficient to determine seasonal variation in quality and quantity. Some of these data are submitted in Appendix 7-1, in a 2007 hydrologic report prepared by Petersen Hydrologic, LLC.

Table 7-1 identifies the location, drainage basin, geologic formation, and uses for the baseline monitoring stations. Drawing 7-1 shows the locations of springs in the proposed

Coal Hollow permit and adjacent area (The drawing does not show the location of wells as identified in 724.100 of the MRP). Table 7-5 shows the hydrologic monitoring locations for surface and groundwater sites, and it lists the protocols for monitoring parameters and frequencies identified in Table 7-4. Table 7-6 identifies the list of field and laboratory parameters the applicant proposed to monitor quarterly for surface baseline sites. Table 7-7 identifies the list of field and laboratory parameters the applicant proposed to monitor quarterly for groundwater baseline sites.

Drawing 7-1 shows two clusters of springs in the vicinity of the mine permit area, and associated with the alluvial plain of Sink Valley Wash, one is located on the northwest corner of Section 29 (Discharge Area A, Drawing 7-4) and the other is located on the northwest corner of Section 32 (Discharge Area B). The data shows that most of the springs within the proposed permit boundary emit very low flows. In the northern cluster, Spring SP-16 flows about 1 gpm, whereas, springs SP-22, SP-23, SP-24, SP-25 and SP-26 flow less than 0.1 gpm. Spring SP-36 is shown on Drawing 7-1, but has not been reported to the DOGM Water Quality Database. Spring SP-14 has a flow range between 3 to 8 gpm. Springs lying just east of the mine permit area (also part of the northern cluster and Discharge Area A) consist of Springs SP-17, SP-18, SP-19 and SP-21, which flow less than 0.1 gpm. Spring SP-20 flows between 5-10 gpm and Spring SP-8 flows between 10 to 20 gpm. Only SP-8 is identified on Plate 7-2, as a baseline water monitoring station in the northern cluster. The DOGM database shows Springs SP-8, SP-16 and SP-20 have been monitored for field and laboratory parameters, although Spring SP-20 has one sample showing laboratory parameter assessment. The other springs in the northern cluster have had field parameters assessed.

Springs SP-8, SP-14, SP-16, SP-19, SP-20, SP-22, SP-24 and Sorensen Spring (SP-40), as well as, Springs SP-6, SP-8 and SP-33, located in Sink Valley below the proposed mine area, will be monitored for discharge and water quality during operational phase

Water quality in the northern cluster of springs is good. The pH ranges between 7 and 8. Conductivity is runs less than 800 umhos/cm in most samples; only Springs SP-24, SP-25 and SP-26 have conductivities in the 1,000 to 1,300 umhos/cm, which is still considered good. Heavy metal concentrations are very low. Calcium and magnesium constituents are a bit elevated.

Spring SP-6 is a low flowing alluvial spring located just outside the southern boundary of the mine permit area. SP-6 is not on Drawing 7-1, but is on Drawing 7-2. It has been monitored during several quarters during 2005, 2006 and 2007. Water quality analysis were collected and analyzed during the last three years. The water quality of SP-6 is similar to the water quality of the northern cluster springs.

The southern cluster of springs lies just south of SP-6. Springs SP-27, SP-28, SP-29 SP-30, SP-32, and SP-33. Spring SP-33 is the only spring in the cluster to be monitored for water quality and field parameters. Quarterly reporting of field and laboratory parameters

was submitted to the DOGM database for the past three years for SP-33. The other springs in the cluster were monitored for field parameters. All of the springs in the cluster except Spring-33 have very low flows, which range less than 0.1 gpm. Spring 33 flows between 4 and 13 gpm. Compared to the northern cluster of springs, the springs in the southern cluster have higher pH values (from 7.35 to 9.1), accompanied by higher levels of total dissolved solids and specific conductance, reflecting the higher levels of sodium, potassium and calcium the water has picked up as it migrates down the valley. The levels of heavy metals do not increase substantially.

The Applicant describes 13 surface-water baseline monitoring points in Section 724.200.

Kanab Creek drainage

- SW-1 Kanab Creek near Alton, Utah; above proposed mining areas, SW-2 Kanab Creek below Lower Robinson Creek and below proposed mining areas, SW-3 Kanab Creek above proposed mining areas, and
- Lamb Canal irrigation ditch west of the permit area, adjacent to Kanab Creek.

Lower Robinson Creek drainage

- SW-4 Robinson Creek above proposed mining areas),
- SW-5 Lower Robinson Creek below proposed mining areas,
- SW-101 Lower Robinson Creek near proposed mining areas, and BLM-1 (Lower Robinson Creek adjacent to proposed mining areas.

Sink Valley Wash drainage

- SW-6 headwaters of unnamed tributary to lower Sink Valley Wash,
- SW-7 unnamed drainage in Section 21, T39S, R5W,
- SW-8 Swapp Hollow above proposed mining areas,
- SW-9 Sink Valley Wash below proposed mining areas,
- SW-10 unnamed tributary to Sink Valley Wash, and
- RID-1 irrigation diversion of water from Water Canyon drainage above proposed mining areas.

Erik Petersen notified the Division by e-mail on August 24, 2009 that two additional surface-water monitoring points were being added: SVWOBS-1 in the NW/4 of Section 21, T. 39 S., R. 5 W., where the northern fork of Sink Valley Wash crosses the two-track that accesses the drainage in the center of Section 21, and SVWOBS-2, located where Sink Valley Wash crosses the Swapp Hollow access road east of the Sorensen Ranch house. These have been added to the Division's database but not to maps, tables, or other locations in the MRP.

The Division received a comment that baseline water quality and quantity data were not sufficient, that one or more season's data were missing for some sites, and that data have

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not been collected for two years. The Division's Tech-004 is cited: Tech -004 is a guideline, not a rule, and is not enforceable. Tech-004 advises one year of baseline data, adequate to describe seasonal variation, before the submission of the application. The Applicant has met this standard.

The following table summarizes what is in the Division's electronic database for the 13 sites listed above, plus SW-I0, BLM-1, and Lamb Canal: Table 4 of Appendix 7-1 also contains discharge and water quality data for these sites (except BLM-1) and discharges for most are plotted in Figure 13 of Appendix 7-1. Although data are missing for some quarters at certain sites, the data are sufficient to determine seasonal variation in quality and quantity, and data collection is ongoing.

F - field parameters only; B - baseline parameters; NA - no access; NF - no flow														
Qtr.	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-101	RID-1	Lambs Canal	BLM-1	SW-10
1-87														
2-87		F												
3-87	F	F	F			F	F	F						F
4-87	F	F	F	F	F	F	F	F	F					F
1-88	F	F	F	F	F	F	F	F	F					F
1-89														F
2-05	B	B	B	B	B			B	NF	B				
2-05												F		NF
3-05	B	B	B		NF	NF		B	NF	NF		F		NF
4-05	B	B	B	NF			NF	B	NF	NF	B	NF		NF
1-06	B	NA	B			B			B	B		NA		NF
2-06	B	B	B	NF	B	NF		B	NF	NF	B	F		NF
3-06	B	B	B	NF	B	NF	NF	B	NF		B	NF		NF
4-06	B		B	NF	NF	NF	NF	B	NF	NF	B			NF
1-07	B	B	B	NF	NF	NF	NF	B	NF		B	F	F	NF
2-07				NF	NF	NF	NF		NF	NF		F	F	NF
3-07	B	B		NF		NF	NF	B	NF	NF	B	F	F	NF
4-07	B	NA	B	NF	NF	NF	NF	B	NF	NF	NF			NF
1-08		NA	B	NA	NA	B		NA	B	NF	NA		NA	F
2-08	B	B	B	NF	B	NF	NF	B	NF	NF	B	F		NF
3-08	B	B	B	NF	B	NF	NF	B	NF	NF	B	NF	F	NF
4-08	NA	NA	NA	NA	NA	NF	NA	NA	NF	NF	NA	NA	NA	NF
1-09		NA	B	NF	B	B	NF	B	NF	B	B	NF	F	NF

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F - field parameters only; B - baseline parameters; NA - no access; NF - no flow														
Qtr.	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-101	RID-1	Lambs Canal	BLM-1	SW-10
2-09	NA	B	B	NF	B	NF	NF	B	NF	NF	B	B	F	NF

Wells

The applicant discusses the use of wells to assess groundwater conditions in Section 724.100. The Applicant initiated a drilling program in the second quarter of 2005, which included 30 monitoring wells on and adjacent to the permit area. Investigative methods and results of the analysis of the data are described in Appendix 7-1. The information Table 7-4 gives a list of baseline monitoring wells, Y-36, Y-38 Y-45, Y-59, Y-61, Y-63, Y-99(A2), and Y-102(A5).

Drawing 7-12 shows the well locations for coal monitoring (boreholes) and alluvial monitoring wells. Drawing 7-13 shows the potentiometric levels of groundwater from water levels in the wells. Table 7-2 provides the monitoring well details (collar elevation, depth, depth to bedrock and screened interval. It is unclear in the table if the depth is from the top of the collar or surface, see deficiency written under R645-301-724.100.

The applicant provides graphs of water elevations in wells Y-36, Y-38, Y-59, Y-63, Y-98 and Y-102. There is not a graph for Y-61, however there is some discharge data in the DOGM database. The data shows Y-61 is an artesian well

Several boreholes encountered water at depths of approximately 10 – 15 feet, and flowing sands were found at 15 to 25 feet. The subsurface investigation was done during a period of high snowmelt; seasonal fluctuations of water levels of several feet are not uncommon (Appendix 5-1, Section 4.3). Drill logs, by Petersen Hydraulic and Taylor Geo-Engineering, are in Appendix B of Appendix 5-1. Geotechnical data from the boreholes are in Appendices C-1 and C-2 of Appendix 5-1. Drilling and sample locations are shown on Drawing 5-39.

The well monitoring data has provided the applicant with the information to evaluate the groundwater regime. Drilling programs identified the depth of coal, identify overlying strata and establish the level of groundwater or piezometric surface of groundwater, Drawing 7-13. Table 10, Appendix 1 identifies two wells as having artesian flow in Sink Valley, Y-61 and C5-130, in alluvial ground water system east of the permit area (Dwg. 7-12 and 7-13, Table 1 and Table 5 in Appendix 7-1). Assessment of data from wells Y-61 and Y-102 indicates groundwater quality in Sink Valley is of good quality and plentiful. The seasonal variation of water quality is established for these two wells. These reflect the groundwater moving through Sink Valley from Water Canyon, Section 21 drainage, and Swapp Canyon drainage. The applicant conducted a

drawdown and recovery test on Well Y-61. The pumping rate was 334 gpm. Both springs (SP-20, SP-8, SP-14) and wells (C2-40, C3-40, C4-30 and SS-30) were monitored for drawdown. Figures 17 and 18 show graphs over the elapsed time of pumping.

Mining in the lower part of Section 30 will also destroy wells Y-102, C2, C7, C8, and C9, which lie within the Sink Valley groundwater trough. Groundwater monitoring should be established in the lower part of sink valley to monitor water quality changes during operational and reclamation phases.

Holes LR, LR45, C0, C6, Y-49 and Y-50 were drilled on the west side of the drainage divide (which is shown on Figure 19, Appendix 7-1). Alluvial sediments are shallower in the Robinson side of the permit and the well information shows lower water levels. There is very little water quality data from wells on the Robinson Creek side of the drainage divide. Since monitoring began in January 2007 through March 2009, Well C6 has been dry. Water levels were measured in Y-49 and Y-50 in 1980, 1986, and 1987, but no water quality were collected.

Since 2007, water level data has been measured at C0 and depth and baseline water quality at LR-45. Mining in this area will destroy most of these wells.

Although there is only a small amount of monitoring information on the west side of the permit area, the applicant has established the hydrologic regime in that part of the permit area Figures 21 and Drawing 7-13. The groundwater drainage divide created by the fault and dip of the beds have isolated the west and northern portion of the mine permit from the recharge areas to the west.

The piezometric surface was derived with a paucity of well data on the west and north side of the permit. The method used to derive the piezometric surface must be described.

The Applicant has identified that, in and adjacent to the proposed permit area, groundwater resources in the Tropic Shale and Dakota Formation are limited, and neither is a significant source of ground water. Information supporting this conclusion is found in Section 721. Chapter 6 and Appendix 7-1 contain information on the lithology and stratigraphy of the Tropic and Dakota strata. Bore-hole logs in Appendix 6-4 indicate strata overlying and immediately underlying the Smirl Coal do not possess aquifer characteristics.

In the proposed permit and adjacent area, Tropic Shale and Dakota Formation provide no baseflow to streams or water from wells. The Applicant has identified one small spring (SP-4; average flow ~1 gpm) that flows from a fault zone in the Dakota and seeps SP-27 (also known as Clampett Spring) and SP-34 that flow from the Dakota Formation in the area just south of the proposed mine (Drawing 7-1). There are no wells in the proposed permit and adjacent area that produce water from the Tropic Shale or Dakota Formation. Mining of the Smirl Coal, at the Tropic - Dakota interface, is not expected to intercept significant volumes of water from these strata nor adversely impact any aquifer below the coal.

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The Applicant states that the Dakota Formation is not a good aquifer. Vertical and horizontal ground-water flow in the Dakota Formation is impeded by the presence of low-permeability shales that encase the interbedded, lenticular sandstone strata in the formation, and the natural flow of ground water through the formation is meager, with only minor discharge from the Dakota to springs or streams in the surrounding area. The Tropic Shale that overlies the Dakota limits vertical recharge (Section 624.100; Groundwater).

Slug tests on wells screened in the Smirl Coal Seam indicate relatively low hydraulic conductivity values (Table 7-8). In much of the proposed mining area, the coal seam has been found to be dry. Neither large inflows of ground water from the coal seam into mine workings from the Dakota Formation nor seepage out of mine pits through the coal seam is expected.

The Division received a comment that the boreholes did not extend to the aquifers in the Dakota Formation. The commenter did not identify aquifers or present evidence of aquifers in the Dakota Formation. Neither the Division nor the Applicant has found evidence of aquifers in the strata beneath the Smirl Coal Seam that may be adversely impacted by mining.

Borehole logs in Appendix 6-4 contain representative drill-hole logs depicting the nature, depth and thickness of the coal seam to be mined, rider seams in the overlying strata, and the nature of the Dakota Formation strata immediately below the coal seam to be mined, which meets the requirements of the Coal Mining Rules.

A comment was received that there is no description of the geology that includes any aquifer below the lowest coal seam to be mined, and that samples have not been collected from that aquifer. The Navajo Sandstone aquifer is a regional aquifer that provides ground water of good quality for domestic and agricultural use and to municipal wells. It provides baseflow to springs and streams, and it is the first water-bearing strata underlying the Smirl Coal Seam that can produce appreciable quantities of ground water. The Navajo Sandstone does not crop out in the proposed Coal Hollow Mine permit and adjacent area, is effectively isolated from proposed mining areas by more than 1,000 feet largely low-permeability shales and siltstones of Dakota and Carmel Formations, and is not reasonably expected to be impacted by proposed mining operations. The Navajo Sandstone is described in Sections 621, 624.100, 728.310.

The application contains geologic information in Chapter 6, Appendix 7-1, and other sections of the submittal. This information is not sufficient to assist in determining the PHC of the proposed operation on surface and ground waters in the proposed permit and adjacent areas, determining whether the required reclamation can be achieved, and whether the proposed operation has been designed to prevent material damage to the hydrologic balance in the adjacent area. The Sink Valley Fault and associated Tropic Shale ridge are important features in the surface and subsurface hydrology of Sink Valley Wash. Figure 8 of Appendix 7-7 shows the relationship of the springs, ponds, and streams to the Tropic Shale Ridge and fault and the extent of surface disturbance from excavation of the mine pits. The cross-section on Drawing 7-6 shows

the relationship of the pits to the Sink Valley Fault, the Tropic Shale ridge, and the alluvium; however, it does not show the zone of saturation in the alluvium nor the potentiometric surface.

The Applicant submitted Drawings 7-15 and 7-15B and Plates 1 and 2. Drawing 7-15B is a series of five east-west cross sections, approximately 1000 feet apart; the locations are on Drawing 7-15 and Plate 1. The cross sections extend beyond the Permit Boundary to the Sink Valley Wash channel and show the relationship of the proposed mining to the hydrology of the adjacent area. They show the extent of the pits and overburden removal, the location of the Sink Valley Fault and Tropic Shale Ridge, and the general extent and thickness of the coarse sediments where groundwater flow is more likely. Drawing 7-15B also indicates the potentiometric surface, and Plate 2 depicts a Compacted Shale Barrier on cross section E-E'.

As mining progresses to the east, it will encounter the Tropic Shale ridge, a mass of consolidated non-permeable rock forming the west limb of the Sink Valley trough. As mining removes this ridge, it will contact the colluvial sediments that transport ground water to the springs. Several of the springs, which receive their supply of groundwater through the alluvial system are likely to be intercepted by the excavation of the mine pits; however, the recharge area for these springs lies father to the east and will not be disturbed. The supply may be reestablished after the coal is extracted if the mine pits are reconstructed so that the fill that once formed the limb of the trough is reformed and tightly compacted to form a hydrologic barrier. If the fractured shale cannot be adequately compacted, then an impermeable barrier may be required. The spring flow may be reestablished if colluvial sediments are backfilled. Springs may not reestablish in exactly the same place, but the supply source coming from the northeast will continue to deliver flows to the area.

Baseline Cumulative Impact Area Information

The Division has not initiated the CHIA findings document. Information from the permit application will be used along with information from other sources in preparing the CHIA. The Applicant may be required to provide additional information.

Probable Hydrologic Consequences Determination

The Division analyzed surface and groundwater data from the database and PAP to determine that sufficient monitoring information was available to assess the hydrologic regimes, establish seasonal variation, and the potential adverse impacts to the hydrologic balance.

Section 728 contains the PHC Determination, and there is also discussion in Section 724.500. A comment was received that the PHC determination was not based on baseline geologic and hydrologic information "collected for the permit application". The Division finds that there are deficiencies in some of the baseline data and therefore there are deficiencies in the Applicant's PHC determination. The following sections summarize the Applicant's PHC determination and deficiencies identified by the Division.

Potential Adverse Impacts to the Hydrologic Balance (728.310) The application states that information from drilling and aquifer tests indicates that large inflows to the mine pit are not expected; if such inflows develop as mining progresses, the Applicant commits to use techniques such as bentonite- or clay-filled cutoff walls to minimize inflows. Temporary reductions in flow from alluvial aquifers may occur but are likely to be short-lived as the pits will remain open for only 60 to 120 days.

The Division analyzed surface and groundwater data from the database and PAP to determine whether sufficient monitoring information was available to assess the hydrologic regimes, establish seasonal variation, and the potential adverse impacts to the hydrologic balance for the PHC, the Division does not find the data sufficient, see deficiencies written below.

Direct Interception of [Regional] Ground-water Resources

The Applicant has identified that ground-water resources in the Tropic Shale and Dakota Formation are limited and neither the Tropic Shale nor Dakota Formation is a significant source of ground water. Information supporting this conclusion is found in Section 721. Chapter 6 and Appendix 7-1 contain information on the lithology and stratigraphy of the Tropic and Dakota strata. Bore-hole logs in Appendix 6-4 indicate strata overlying and immediately underlying the Smirl Coal do not possess aquifer characteristics. In the proposed permit and adjacent area, these strata provide no baseflow to streams or water from wells. The Applicant has identified one small spring (SP-4; average flow ~1 gpm) and seeps SP-27 (also known as Clampett Spring) and SP-34 that flow from the Dakota Formation in the area just south of the proposed mine (Drawing 7-1). There are no wells in the proposed permit and adjacent area that produce water from the Tropic Shale or Dakota Formation. Mining of the Smirl Coal, at the Tropic – Dakota interface, is not expected to intercept significant volumes of water from these strata nor adversely impact any aquifer below the coal.

A comment was received that there were no contour maps or cross sections depicting seasonal difference in head for aquifers in the Dakota Formation, that there are no water monitoring wells in the Dakota Formation, and that there is no description of the geology that includes any aquifer below the lowest coal seam to be mined. The commenter did not identify an aquifer in the Dakota strata, and neither the Applicant nor the Division has seen any indication of an aquifer or other significant subsurface water resource in the Dakota or Tropic Shale strata, in and adjacent to the coal seam to be mined, that would warrant requiring the mentioned maps and cross sections or requiring the Applicant to install monitoring wells in the Dakota Formation.

The Navajo Sandstone aquifer is a regional aquifer that provides ground water of good quality for domestic and agricultural use and to municipal wells. It provides baseflow to springs and streams and is the first water-bearing stratum underlying the Smirl Coal Seam that can produce appreciable quantities of ground water. It is described in Sections 621, 624.100, 728.310.

The Applicant provides Plate 2 and Figure 19 (App. 7-1) showing the surface water drainages. Three major drainages appear in the vicinity of the proposed mine area: The upper Kanab Creek Drainage, the Sink Valley Drainage and Johnson Wash Drainage. Runoff from Water Canyon, Dry Fork and Lower Robinson Creek drains across the northwest side of the mine permit area. Section 21 Canyon and Swapp Hollow are the recharge source for Sink Valley. The bulk of the groundwater fluxes through the area on the eastern side of the mine. Sink Valley is made up of coarse grained alluvial and colluvial sediments that transmit the groundwater. Maps of the Sink Valley Drainage, as shown in Figure 21, Appendix 7-1 Drawing 7-4, shows two major locations of alluvial groundwater discharge areas east and southeast of the mine permit area. Figure 7-13 shows the potentiometric level of groundwater in the alluvial/Sink Valley area. In this same map the applicant shows the approximate location of the alluvial groundwater divide between Sink Valley and Lower Robinson Creek drainage.

The coal recovery area is shown on Drawing 5-14. The recovery area follows the approximate location of the fault on the east side of the permit. The drawing shows the coal thickness ranges from 7 feet to the west to 18 feet on the east side of the permit area. Overburden thickness in the coal recovery area ranges from zero to about 200 feet on the east side of the permit boundary near the fault. Most of the coal in the recovery area lies below 140 feet. Drawing 5-16 shows the sequence of mining and extent of the surface disturbance from mine pit development. Plate 5-12 shows the typical cross-section of the mine pit.

The Division received comments that groundwater will be depleted and contaminated when mining takes place. The Division has evaluated the PAP for potential impacts mining will have on the groundwater systems of Lower Robinson Creek and Sink Valley wash.

The first year of mine development will take place in the Robinson Creek drainage. It is expected that the mine will encounter only minor amounts of ground water in the colluvial deposits above the permit area and groundwater trapped in the coal zone. The second and third years will see Pit 2 and Pit 3 developed in the eastern part of the permit. As the mine progresses westward the bottom of the pit will not extend all the way to the permit boundary, but stop at a point where the pit walls, angled at about a 2:1 slope, will extend from the pit floor to the permit boundary. When the pit walls are excavated on the east, mining will mine through the west side of the alluvial trough (Petersen Hydrologic Report Figures 6d, 6e, and 6f Petersen report). This alluvial trough holds and channels groundwater from the drainages to the lower basin of Sink Valley. These cross-sections should be extended westward to include the mine pit, such that an idea of the elevation of the cut and the lowering of the gradient of the groundwater in Sink Valley could be ascertained. The applicant has supplied a discussion how the pit will be reclaimed to restore the groundwater level in Sink Valley.

The Division analyzed surface and groundwater data from the database and PAP to determine that sufficient monitoring information was available to assess the hydrologic regimes, establish seasonal variation, and the potential adverse impacts to the hydrologic balance.

The applicant has described Sink Valley as a large alluvial fan at the foot of the large canyons (Robinson and Swapp Hollow east of Sink Valley). The groundwater flow pattern east of the mine area, is described as having at least two transmissive layers that control flow in Sink Valley, a lower coarse grained gravel that contains a deep aquifer and an upper finer grained alluvium that holds groundwater but is less transmissive. Groundwater flowing to the upper alluvium from the eastern canyons flows along the upper surface and discharges as spring (or wet) areas. Sink Valley is separated from the proposed mine area by a shale ridge running northeast to southwest on the eastern side of the proposed mine area. The potentiometric map in Drawing 7-13 shows the saturated level of ground in Sink Valley and in the proposed mine area. Drilling conducted by the ACD has confirmed that the material overlying the mine site is stratified shale, siltstone and sandstone layers that do not support an aquifer. No aquifer exists west of the shale ridge.

The applicant identifies two wet areas (Figure 15) on the surface of Sink Valley. A portion of the northern aquifer extends onto the proposed permit area. The applicant identifies these sites as discharge areas of the alluvial fan aquifer (Section 2.1, Peterson Report). Eric Peterson, hydrologic consultant for ACD. Mister Peterson defines the aquifer in the alluvial fan as a continuous interconnected aquifer showing a potentiometric surface as seen in Figures 16a and 16b. The alluvial fan is supplied by runoff that filters into the alluvium from springs and streams of Water Canyon and Swapp Hollow. Well data indicates that there is a more confining layer of sediment in the upper layers and a more coarse grained layer in the lower areas of Sink Valley. The confining layer appears saturated and contiguous with the lower aquifer. The confining layer ranges from upper Sink Valley to lower Sink Valley above the Jones' property. Water flowing from the canyons infiltrate into the alluvial fan. The amount of water flowing from the canyons has been measured at the springs and in the short channel below, Water Canyon before it infiltrates into the ground. No surface water appears in the lower channels of Water Canyon, Robinson Creek or Swapp Hollow unless it is a very large storm event. The confining acts as an aquitard that supplies springs in the northwest area of Section 29. A deeper aquifer lies below the multi layered aquitard supporting well Y-61. This information is nearly consistent with Paul Andersons Model of the Alluvial Valley Floor Report, February 1991.

The information indicates the Sink Valley aquifer may be drawn down substantially. As an example, if one looks at cross-section D-D' in Figure 6e, Petersen Hydrologic Report, December 15, 2008) and imposes the mine pit in relation to the cross-section. The mine pit is expected to be about 110 feet in the area of Well C-3, Drawing 5-15. The mine pit wall angle is about a 2:1 slope, Drawing 5-12. That puts the bottom of the pit 220 feet from the mine permit boundary. As mining removes the western edge of the trough that holds the aquifer, flow from the aquifer will enter the mine. Rough estimates near Well C-3 show the aquifer could be lowered 30 feet, which equates to a large volume of water. When one considers that the Sink Valley aquifer will be mined into almost a mile, groundwater interception could be substantial if the replacement material does not seal the aquifer.

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The applicant reports that the mine should not intercept large amounts of water from Sink Valley. However, they have provided a contingency plan in Section 727 to provide an alternative water source. ACD will develop a well on private land, in the north west quarter of Section 29, T39S. R5W. The planned location for the well is situated within the proposed mine permit area, shown on Drawing 5-8C. The well will produce water from the alluvial groundwater system in Sink Valley. ACD will not use well Y-61. It is believed that adequate water can be produced from the new well to satisfy the potential water replacement needs of the mine.

The information requested for well Y-61 in the last technical review no longer applies, because the information was needed to ensure water right of the well were being protected.

In the submittal of August 27, 2009, the applicant responded to the Division's concerns that the mine workings will intercept groundwater sources from Sink Valley, including springs. They concur that interception of groundwater and springs is likely. ACD proposes techniques to minimize impacts to the surface and ground water resources. Using well data the applicant identifies the potential extent of coarse grained alluvium (Plates 1 and 2) that stores and transmits the larger volume of ground water in Sink Valley. Several drill holes and wells extend into the coarse grained alluvium. Since the water is used for a specific purpose the alluvial zone is designated an aquifer, by definition, R645-301-100. The applicant should be able to replace surface water rights with discharges from the new well. Information provided by the applicant previously mentioned in the review, shows the upper section of the lower aquifer will be intercepted. There should still be sufficient depth in the aquifer to provide water to well Y-61 for its intended purpose.

The recharge source from the east, Water Canyon and Swapp Hollow, works in favor of supplying the recharge source to the aquifer. The supply of water for the deeper wells should still be available even if the mine intercepts the aquifer, because the aquifer is deeper than the lowest point of mine intersection into the aquifer. Cross-sections on Plate 2 show how the fine grained alluvium and coarse grained alluvium relate to each other and the mine. Plate 2 shows the mine coming in contact with the coarse grained alluvium at cross-section E-E'. According to the Applicant's assessment the mine does not contact the coarse grained aquifer at D-D', or south of that point.

The applicant proposes to develop the mine by operating individual mine pits Plate 1. In most cases they will remain open between 60 to 120 days. Mine inflows will be monitored to determine inflow rates. The panel width is runs east-west in the southern part of the mine inflows should be less because the exposes side is less. Greater inflows could occur in the northern part of the permit where panels run north-south. Based on the hydrogeologic conditions ACD will use a suitable technique to minimize groundwater inflow rates to the mine. The applicant has proposed mitigation measures to mine inflows in Appendix 7-9. Plans call for measures to be taken while mining and to install a shale barrier as shown on Plate 2. If diminution of discharge rates from seeps and springs as a consequence of mining, any lost water will be replaced according to all applicable Utah State laws and regulations.

The recharge source from the east works in favor of still supplying the aquifer. The Division suggests the applicant consider alternatives such as installing wells along the east side of the permit area and pump groundwater back to Sink Valley, to the channel where some flows can be used. It will eliminate flow to the pit where it can become more contaminated. It will also eliminate pumping to Kanab Creek via Robinson Creek.

The recharge source and mitigation barrier should ensure the groundwater flow in Sink Valley is maintained.

Diminution of Downgradient Ground-water Resources

The Applicant has identified that neither the Tropic Shale nor Dakota Sandstone are a significant source of ground water. In the proposed permit and adjacent area, the Dakota Sandstone supports flow from one small fault-related spring and a few seeps that have no associated water rights.

Draining of Upgradient Ground-water Resources

Based on information from water monitoring wells, including slug tests and a pumping and recovery test of Y-61, and analysis of the geology and hydrology of the proposed permit and adjacent area, the Applicant has concluded that the proposed mine plan is designed to minimize potential diminution of flow from the alluvial springs in the proposed permit and adjacent area.

The Applicant notes that after the pump Y-61 was stopped at the end of the 28-hour pumping test, spring discharge rates and water levels in alluvial monitoring wells recovered to approximate pre-test levels. Figure 18 in Appendix 7-1 shows the drawdown and recovery response of four wells (C2-40, C3-40, C4-30, and SS-30) and three springs (SP-20, SP-8, and SP-14). The observation springs were 750 to 1,400 and the wells 1,800 to 4,400 feet from the pumping well. Drawing 7-14 illustrates the drawdown at C2-40 and two other wells, Y-102 and Y-59, which were within 1,000 of Y-61; the Applicant states that drawdowns at more distant wells are too small to show at the scale on this drawing. Figure 17 of Appendix 7-7 illustrates the size and shape of the cone of depression from this pump-drawdown test.

The relationship of the alluvial ground-water table to wells and springs in and adjacent to the NW1/4 of Sec 29 is crucial in understanding the PHC of the proposed mining operation. Figure 18 in Appendix 7-1 indicates that during the pump test on Y-61, water levels actually increased at SP-8 and SS-30 and flow increased at C2-40 after 4 hours of pumping..

If inflows to the mine pits become excessive as mining progresses, the Applicant commits to use techniques such as bentonite- or clay-filled cutoff walls to minimize inflows. Temporary reductions in flow from alluvial aquifers may occur but are likely to be short-lived as the pits will remain open for only 60 to 120 days.

Water replacement is discussed in Section 727. Long-term diminution of flow will be replaced with water from a well that has not been drilled yet. The town of Alton has entered into an agreement to transfer a point of diversion for water rights to 50 acre-feet of water, which the Applicant plans to use to satisfy the water replacement requirements: a copy of the agreement with the town of Alton is in Appendix 7-8. The planned new water well, to be constructed on lands currently leased by Alton Coal Development, LLC, will be constructed on lands currently leased by Alton Coal Development, LLC..

Acid and Toxic-forming Materials (728.320)

Appendix 6-2 contains information on the acid- and toxic-forming potential of earth materials naturally present in the proposed permit and adjacent areas. Appendix 6-1 (confidential binder) has information on the Smirl Coal Seam that is proposed for mining. Geochemical data indicate the potential for AMD and toxic drainage is low. Acid- or toxic-forming materials do not appear to be present in the proposed permit and adjacent area in amounts that create a concern, as discussed in Section 728.332. The composite neutralization potential of the overburden and underburden is 180 tons per kiloton, which is almost 33 times the acid potential of 5.5 tons per kiloton, indicating a strong likelihood that acid-mine drainage will not be an issue at the Coal Hollow Mine.

Materials with poor quality SAR, elevated selenium or boron concentrations, or poor pH will not be placed in the upper 4 feet of the reclaimed surface (Chapter 2). See also, selenium monitoring discussion under Reclamation/Hydrology.

Impacts to Important Water-quality Parameters (728.332)

The Applicant does not anticipate discharge of waters from the Tropic Shale or Dakota sandstone. The plan calls for limiting inflow of alluvial waters into the pits, reducing the potential for contamination, mainly from increased TDS concentrations.

In Section 728.333, the Applicant outlines special measures to be taken when mining nears the eastern edge of Pits 13-15, where there is the greatest chance of intercepting large quantities of ground water from the alluvial artesian ground-water system in the NW $\frac{1}{4}$ of Section 29, T. 5 W., R. 39 S. These measures can minimize the potential for ground-water inflows and deal with them if they occur.

The Applicant anticipates that water will not be discharged from the mine pits. Water in mine pits interferes with the surface mining technique, so keeping water out of the pits is a priority of mine operation. The only likely, foreseeable source of appreciable quantities of ground water is from the alluvial ground-water systems overlying the Tropic Shale. Where possible, ground water encountered in alluvial sediments along the margins of mine pit areas

will, as a temporary measure, be intercepted, drained through pipes, ditches or other conveyance methods away from mining areas (Section 728.332, p. 7-35).

The Applicant states that excavation of the alluvial sediments at the eastern edge of the permit boundary in Pits 13, 14, and 15 will proceed incrementally and with caution. If coarse, water-bearing alluvial sediments are encountered, the equipment operators will stop overburden removal and cover the exposed gravels with available impermeable alluvial material (Tropic Shale) to, if possible, halt ground-water inflow. A hydrogeologist will be called to the site to assess the conditions (Section 728.333, p. 7-28). Prior to the resumption of overburden removal, the Applicant will develop a suitable work plan, designed to minimize the potential for intercepting unacceptably large inflows of ground water into the mine pits. The work plan may include such measures as trenching and emplacement of a low-permeability cut-off wall to isolate the mine openings from the coarse-grained alluvial ground-water system, with the object of minimizing the potential for detrimental impacts to the hydrologic balance and the potential for flooding of mine pits and causing flooding or stream alteration through the discharge of large volumes of water.

The Applicant states that where possible, ground water encountered in alluvial sediments along the margins of mine pit areas will, as a temporary measure, be intercepted, drained through pipes, ditches or other conveyance methods away from mining areas (Section 728.332, p. 7-35). This will prevent or minimize the potential for interaction with sediments disturbed by mining operations, including contact with the mined coal seam. These intercepted alluvial ground waters would be routed into Pond 4, which has a storage capacity of 7.5 acre-ft, 1.8 acre-ft more than required, and an emergency discharge structure (Section 728.333). Design parameters for Pond 4 are in Appendix 5-2. The Applicant does not have a UPDES permit, but commits that any discharges from the mine will be done under a UPDES permit (Section 728.333).

Sedimentation ponds and other sediment control methods will minimize erosion from disturbed areas and control or prevent additional contributions of suspended solids to stream flow or runoff outside the permit area.

The Applicant commits to using spill control kits on all equipment to minimize contamination from spillage of hydrocarbons, and that the site will have a SPCC plan (Section 728.322).

The Applicant states that as ground water migrates through the shallow, fine-grained alluvial sediments in the proposed Coal Hollow Mine permit and adjacent area (most notably in Sink Valley), the quality of the water is naturally degraded: Appendix 7-1 is referenced for this information. Drawing 7-5 shows that specific conductance of the water increases downgradient. Stiff diagrams for selected springs, shown on Figure 14 of Appendix 7-1, indicate a downgradient evolution from calcium-magnesium-bicarbonate type waters toward waters with greater portions of sodium, potassium, magnesium, and sulfate and increased TDS.

In Section 728.333, the Applicant outlines special measures to be taken when mining nears the eastern edge of Pits 13-15, where there is the greatest chance of intercepting large quantities of ground water from the alluvial artesian ground-water system in the NW ¼ of Section 29, T. 5 W., R. 39 S. Appendix 7-9 provides more of the details in this Contingency Plan. These measures can minimize the potential for ground-water inflows and deal with them if they occur.

The application states that pumping and discharging of mine water from mine pits at the proposed Coal Hollow Mine permit area is not anticipated. If excessive quantities of water, from any source, were to flow into the pits, the Applicant commits that water is to be pumped from the pits using suitable equipment that will be kept on-site. The water will be managed in compliance with applicable State and federal regulations. The Applicant emphasizes that flooding of the pit would hinder mine operations and it will be in their best interest to take all reasonable efforts to minimize the potential for flooding of the mine pits (Section 728.333).

Historically, flooding of pit mines by heavy precipitation is a known occurrence; however, because the Coal Hollow Mine has been designed to fully contain surface runoff from a 100-year, 24-hour precipitation event, with an additional capacity for a margin of safety; the potential for actual flooding of the mine pits from storm runoff is very unlikely.

Flooding or Streamflow Alteration (728.333)

The Applicant asserts in Section 728.333 that the reasonably foreseeable mine discharge of several hundred gpm and the maximum anticipated alluvial ground-water discharge to Sink Valley Wash or Lower Robinson Creek are much less than the flows occurring periodically in those drainages during torrential precipitation events, and will likely not be sufficient to potentially cause flooding or stream flow alteration in either drainage. The addition of modest amounts of sediment-free water into these stream channels has the potential to cause minor increases in channel erosion; however, the magnitude of this potential impact will likely be small relative to the erosion and sedimentation occurring during torrential precipitation events.

Based on the estimated mine pit ground-water inflow rates in Table 7-9, the Applicant considers it likely that mine interception will be on the order of a few tens of gpm (dry areas; small pit size) to several hundred gpm (wetter areas; large pit size). In most instances, individual mine pits in will remain open for no more than about 60 to 120 days, minimizing inflow (Sections 724.500 and 728.310, p. 7-31). The Applicant stated that if substantial ground water flowed into the mine a study would be conducted to mitigate the flow. The Applicant has provided a series of cross-sections showing how the mine would intercept the Sink Valley trough. The Applicant has shown the estimated elevation where the mine will contact the Sink Valley trough and the amount of flow expected while the pit is open.

The Applicant states in Section 728.333 that lower Sink Valley Wash (below the County Road 136 crossing), Lower Robinson Creek, and Kanab Creek have large discharge capacities

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and periodically convey large volumes of runoff. The Division's database contains flow data from these streams back to 1987. The data show that, although Kanab Creek, Sink Valley Wash, and Robinson Creek are typically dry, flows of several hundred gpm - and on occasion thousands of gpm - occur periodically. The maximum flow reported for Kanab Creek is 6,283 (14 cfs) at SW-2 (above the confluence with Lower Robinson Creek) on 2/11/1988; a more recent high flow of 4,170 gpm (9 cfs) occurred on Kanab Creek at SW-3 (below the confluence with Lower Robinson Creek) on 03/22/2008.

The Applicant finds it noteworthy that the principle surface drainages in and adjacent to the proposed Coal Hollow Mine permit area, i.e., Lower Robinson and Kanab Creeks and their tributaries, are in many locations not stable in their current configurations, and are actively eroding their channels during precipitation events. This results in down-cutting and entrenchment of stream channels, the formation of unstable near-vertical erosional escarpments adjacent to stream channels that occasionally spall off into the stream channel, aggressive headward erosion of stream channels and side tributaries, and the transport of large quantities of sediment associated with torrential precipitation events. These processes appear to be migrating upstream, resulting in increasing lengths of unstable stream channels. The Applicant cites researchers who propose that although the creation of the numerous arroyos currently in existence in the southwestern United States is not completely understood, the effect may have been magnified by the temporal coincidence of several factors: 1) valley fill alluviation in the southern Colorado Plateau occurred during a long-term decrease in the frequency of large, destructive floods, which ended in about 1880 with the beginning of the historic arroyo cutting; 2) the shift from deposition to valley entrenchment coincided with the beginning of an episode of the largest floods in the preceding 400-500 years, which was probably caused by an increased recurrence and intensity of flood-producing El Nino Southern Oscillation events beginning around 1870; 3) land-use practices such as livestock grazing, and 4) natural cycles of erosion and deposition caused by internal adjustments to the channel system. The Applicant cites historical evidence that the cutting of Kanab Creek began with a large storm on 29 July 1883, followed by unusually large amounts of precipitation in 1884-85, and that during this period, the Kanab Creek channel was down-cut by 60 feet and widened by 70 feet over a distance of about 15 miles: the lowering of Kanab Creek may have resulted in a lowering of the local base level and consequent incision of both Sink Valley Wash and Lower Robinson Creek. Heavy livestock grazing likely contributed to the stream down-cutting episode in the late 1800s. The Applicant proposes that the Coal Hollow Mine MRP is designed to minimize the potential for sediment yield and erosion and consequently for stream channel erosion and instability; no mining-related activities are planned that would likely increase current instability of the surface water drainages in the permit and adjacent area (Section 728.333).

The application states in Section 728.333 that most precipitation runoff on disturbed areas will be contained in diversion ditches and routed to sedimentation impoundments. Sediment control facilities will be geotechnically stable, minimizing the potential for breaches, which can result in down-stream flooding and increased erosion and sediment yield. Emergency spillways will provide a non-destructive discharge route from the impoundments, if needed.

In the proposed mining plan, Lower Robinson Creek is to be diverted temporarily. Appendix 5-3, prepared by Dr. James E. Nelson, Assistant Professor, Civil and Environmental Engineering at BYU, contains the analysis and specifications for this diversion, and Drawings 5-20 and 5-21A show design details for the construction and reclamation of this channel. The resulting temporary channel will have straight reaches and three sharp bends - including two 90° bends - and will require extensive rip-rap. The reclaimed channel will be in approximately the same location as the current channel; however, instead of restoring the channel to its current configuration, with an entrenched channel and steep embankments, the Applicant proposes a sinuous channel, flanked by a narrow flood plain, with banks laid back at a more gentle angle.

Ground Water and Surface Water Availability (728.334)

Water rights are shown on Drawing 7-3 and listed in Appendix 7-3. (The spring designations on Drawing 7-3 do not match those on other maps; the Applicant has been asked to rectify this confusing discrepancy, see R645-301-121.200 and R645-301-720). Domestic water for the Swapp and Sorenson Ranches comes from alluvial springs. Spring SP-8 (water right 85-363) supplies the Swapp Ranch, but the water right doesn't designate domestic use. Sorensen's water right 85-373 (SP-3) is for both stockwatering and domestic use. Pugh's water right 85-215 (SP-7) is located right along the fence between Pugh's and Dame's properties and is the only domestic water right within the proposed permit area. Spring SP-10B (water right 85-1011), south of the proposed permit area, supplies domestic water for the Johnson family.

Alluvial springs have provided limited irrigation water for home gardens and fruit trees in areas adjacent to the proposed Coal Hollow Mine permit area (Drawing 7-7), but other than some current yard irrigation at the Swapp Ranch house, these lands have not been irrigated for over 10 years (Personal communication, Burton Pugh, 2008; Richard Dame, 2007). The Pughs and Dames own both the coal that will be mined and the overlying surface, as shown on Drawings 1-3 and 1-4.

Mr. Sorensen has used runoff from the adjacent Paunsaugunt Plateau for flood irrigation for hay or grain on lands east of the proposed Coal Hollow permit area (Chapter 4, Exhibit 4-1 and Drawings 1-3, 1-5, 1-6, and 3-1). Based on personal communication between Mr. Sorensen and the Applicant, this irrigation typically has been a single application in the spring and is largely limited to years with appreciable precipitation and stream runoff: with the exception of 2005, water has not been sufficient for flood irrigation in recent years. Source areas for these waters are topographically and stratigraphically upgradient of and distant from the proposed Coal Hollow Mine, and surface- and ground waters from these areas will not be impacted by the proposed mining activities (Section 721; Appendix 7-7, Section 4.1).

The Applicant estimates State appropriated water supplies to be approximately 35 gpm in Alluvial Groundwater Discharge Area A and 17 gpm in Area B (Section 727; Drawings 7-3 and 7-4; Appendix 7-3), so in a worst-case scenario, the Applicant would be required to replace

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approximately 52 gpm of state appropriated water rights. The Applicant states that the proposed water well in Section 29, T. 39 S., R. 5 W. will be designed to produce water sufficient to meet that demand, and further that the aquifer analysis in Appendix 7-1 suggests that the yield of the alluvial ground-water system should be capable of sustaining discharges of the duration and volume likely needed to replace the water. The Applicant notes that the likely duration will be relatively short (Section 728).

The Applicant has entered into a written agreement with the town of Alton, Utah to transfer the point of diversion for 50 acre-feet of water for use at the Coal Hollow Mine. A copy of this agreement is included in Appendix 7-8

Under Direct Interception of Groundwater Resources (p. 7-25), the Applicant states:

“Alluvial groundwater systems in planned mining areas in the proposed Coal Hollow Mine permit area will be directly intercepted by the mine openings. It is not anticipated that the direct interception of shallow alluvial groundwater will adversely impact the overall hydrologic balance in the region. This is because no springs, seeps or other important groundwater resources have been identified in proposed mine pit areas (Drawing 7-1). In the pre-mining condition, any diffuse groundwater discharge to the ground surface that occurs is primarily lost to evapotranspiration and does not contribute appreciably to the overall hydrologic balance in the area.”

This addresses ground water that supplies springs and seeps but seems to ignore the importance of subirrigation to what is possibly an adjacent AVF and dismisses the impact that direct interception of ground water in the alluvial aquifer would have on the moisture held in the soils and the essential hydrologic function of the adjacent, potential AVF.

Reference is made to Drawing 7-1, which shows the seep and spring locations; however, the Application needs a single map that shows the extent of the pits – including the extent of overburden removal (Drawing 5-16), the location of the fault and Tropic Shale Ridge (Drawing 7-12), the location of the seeps and springs (Drawing 7-1), and the Alluvial Discharge Areas (Drawing 7-4). Such a map doesn't need to show the entire permit area, but rather should center on Pit 15, where the features of interest are proximate and the possibility of impacting the hydrologic balance and the essential hydrologic function of what is possibly an AVF is greatest (see deficiency written under R645-301-624, -724).

Water replacement is discussed in Section 727. Long-term diminution of flow will be replaced with water from a well that has not been drilled yet. The town of Alton has entered into an agreement to transfer a point of diversion for water rights to 50 acre-feet of water, which the Applicant plans to use to satisfy the water replacement requirements: a copy of the agreement is in Appendix 7-8. The planned new water well will be constructed on lands currently leased by Alton Coal Development, LLC. It is not clear if this new well will be the water-supply for the

mine, or for water-replacement only (see deficiency written under R645-301-731.530, p. 126 of the TA).

The Applicant concludes that there is essentially no probability that surface water in the Sink Valley Wash drainage could become unavailable as a result of the proposed mining and reclamation activities: the surface waters originate from up-gradient areas that are located large distances from the proposed mining, and the stream channels are entirely outside the area to be disturbed by mining and reclamation activities. The application states that in the Sink Valley Wash drainage, surface-water flows in Water Canyon and Swapp Hollow are used for stock watering and limited irrigation: Drawing 7-3 shows there are water rights for surface point-of-diversion and point-to-point diversions along Sink Valley Wash but none in the two mentioned tributary drainages. (Monitoring at point SW-8 in Swapp Hollow has consistently noted flow in this channel.) The application also states that below Section 29 T. 39 S., R. 5 W., Sink Valley Wash usually has no appreciable discharge: there are point-to-point and surface point-of-diversion water rights in Sink Valley Wash below Section 29 (Drawing 7-3).

The application indicates Lower Robinson Creek immediately above the proposed permit area typically discharges only in direct response to precipitation or snowmelt, so surface-water availability is limited. Ground water seeps from the alluvium into the deeply incised stream channel near the exposed Dakota-alluvium contact in the bottom of the stream channel, in the SE¼, Section 19, T. 39 S., R. 5 W. (the Applicant considers it noteworthy that the location of this discharge has varied somewhat over time, but offers no further comment on the possible significance of this observation). This seepage, monitored at SW-5 (Drawing 7-2), is characterized as usually 5 - 10 gpm or less: significantly larger flows, as great as 410 gpm, have been reported at this site (Division's database), although such large flows are presumed to be runoff – the database does not distinguish seepage from runoff.

Surface-Water Monitoring Plan

The protocol for baseline and operational surface-water monitoring is in Tables 7-4 through 7-6B. Drawing 7-2 shows baseline monitoring locations except for BLM-1 (BLM-1 is shown on Drawing 7-10). Section 724.200 discusses baseline surface-water monitoring; three paragraphs at the end of Section 724.200 describe baseline surface-water monitoring sites. As shown on Drawing 7-3, SW-18 is on an ephemeral wash located over a mile outside the permit area, and the Applicant has not observed any discharge at SW-18 during monitoring: SW-18 is not included in Table 7-5 because it is not proposed for operational monitoring, and SW-18 is not in the Division's database. Discrepancies between Section 724.200, Drawing 7-2, and Table 7-5, shown in the following table, need to be resolved (see deficiency written under R645-301-724.200 and -121.200).

ENVIRONMENTAL RESOURCE INFORMATION

Baseline Monitoring Sites	Described in Section 724.200	Listed in Table 7-5	Shown on Drawing 7-2	Data in Database
SW-1	√		√	√
SW-2	√	√	√	√
SW-3	√	√	√	√
SW-4	√	√	√	√
SW-5	√	√	√	√
SW-6	√	√	√	√
SW-7	√		√	√
SW-8	√	√	√	√
SW-9	√	√	√	√
SW-10			√	√
SW-18			√	
SW-101	√	√	√	√
BLM-1		√	(Drawing 7-10)	√
RID-1	√	√	√	√
Lamb Canal			√	√

The Applicant will apply for a UPDES permit to discharge from the mine pit, to either Lower Robinson Creek or Sink Valley Wash, which are both tributary to Kanab Creek.

Findings:

Hydrologic Resource Information meets the requirements of the Coal Mining Rules. However the following clear and concise issues should be resolved at the earliest opportunity:

- Strike and dip are not evident on Drawings 6-1 and 6-6 (see statement in Section 622.300). Clearly indicate strike and dip on Drawings 6-1 and 6-6, or if strike and dip are shown on other maps, correct the reference in Section 622.30. R645 - 301- 622.300 requires strike and dip be shown on a map.
- Add Drawings 15 and 15B to the Table of Contents for Chapter 7.
- Add information on surface-water monitoring points SVWOBS-1 and SVWOBS-2 to Section 724.200 and appropriate maps.

- Clarify that silt fencing treating runoff from Watershed 6 will be placed on the upslope or east side of the relocated channel, rather than on the downslope or west side as indicated on Drawing 5-26.
- Update Section 731.600 Stream Buffer Zones to include “ephemeral streams that drain a watershed of at least one square mile” (R645-301-731.600 was reworded after the Applicant’s initial submittal).

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

In response to Task 2910 deficiency: R645-301-521, the Applicant re-created the following maps to utilize the following R645 Coal Mining Rules terminology, “permit boundary” and “permit area”:

Drawings 1-1 through 1-4

Drawing 2-2

Drawing 3-1 through 3-6

Drawing 5-1, 5-2, 5-3, 5-9, 5-10, 5-13, 5-14, 5-15, 5-16, 5-16, 5-17, 5-18, 5-19, 5-20, 5-21, 5-22, 5-23, 5-25, 5-26, 5-27, 5-33, 5-34, 5-35, 5-36, 5-37, 5-38, 5-39

Drawings 6-1, 6-2, 6-5, 6-9

Plates 3 and 4 of the AVF Report

Drawings 7-1, 7-2, 7-3, 7-10, 7-12.

The Applicant has also identified land leased from C. Burton Pugh, which lies outside of the Coal Hollow permit boundary. The leased acreage is identified on Drawing 1-3; the Applicant’s interest is declared on Page 1-6, Chapter 1, Volume 1. Some private ownership remains on the southeast side of the proposed permit area (See Dwg. 1-4, Coal Ownership).

The Applicant states that there are no other areas outside of the proposed permit boundary which are under the exclusive control Alton Coal Development.

Kane County Road #136 will remain under the jurisdiction of Kane County and same will be maintained by the County as a public road (See Appendix 1-7). The Kane County Road K3900 (136) Closure, Relocation and Replacement Agreement, Miscellaneous Provision C are contained on Page 7.

Previous task 2910 deficiency: R645-301-521.130 through R645-301-521.132 and R645-301-521.141, *"The Applicant must address plans to build a public road that will bypass the town of Alton to facilitate mining. The Division has received comments from Alton residents that the town officials have been in negotiations with the Applicant to build a bypass road. The purpose of the bypass road is to route coal truck traffic around Alton. Road construction solely for the purpose of facilitating coal mining is considered "affected area" as defined by R645-100-200 and must be shown on mine maps."*

Alton Coal Development, LLC. has responded that they have no plans for a by-pass, mine haul road. Drawing 1-1 Project Area shows that the north permit boundary for the Coal Hollow Mine is at least two miles from the Town of Alton. The construction of a publicly used, by-pass road around Alton would be under the jurisdiction of the Kane County Commissioners and the Kane County Road Department.

Existing Structures and Facilities Maps

Drawings 1-5 and 1-6 show the location of all buildings in and within 1000 feet of the proposed permit area.

Drawing 1-5 shows the Swapp Ranch (now occupied by the Dames family), which is a frame construction on a layered rock foundation. This dwelling is just over 300 feet from the east permit boundary. Drawing 1-5 is P.E. certified by Mr. Chris McCourt, a Utah registered professional engineer.

Drawing 1-6 shows the various buildings associated with the Sorensen Ranch. Drawing 1-6 is also P.E. certified by Mr. McCourt. The ranch house, which is a wood frame construction on a layered rock foundation, is 950 feet from the closest permit boundary. All other buildings are wood frame construction with no concrete foundations.

Since these two dwellings are within 1,000 feet of the permit boundary, the permit Applicant must submit an anticipated blast design for overburden and coal removal. Chapter 5, p. 5-22 states that Appendix 5-4 contains a blasting plan (anticipated) for the Coal Hollow Mine. Appendix 5-4 is reviewed under Operation Plan/Use of Explosives section of this Technical Analysis.

Existing Surface Configuration Maps

The Applicant has provided maps which show 5 foot contour intervals, including Drawings 5-1, 5-20, 5-20A, 5-21, 5-21A, 5-22, 5-35, 5-36, 5-37, 5-37A.

Mine Workings Maps

There are no other currently active coal mining operations in this area. Page 5-8, Chapter 5, Section 521.110, Previously Mined Areas states that the following underground mining operations previously existed within the Alton Amphitheatre; Seaman Mine, Smirl Mine, Alton Mine, Johnson Mine, and Silver Mine. The PAP states that these mining operations did not exist within the currently proposed permit area or the adjacent area as defined in R645-100-200. The Permittee has not provided any maps of underground workings for these operations.

Drawing 7-15B is a series of five east-west cross sections, approximately 1000 feet apart: the locations are on Drawing 7-15 and Plate 1. The cross sections extend beyond the Permit Boundary to the Sink Valley Wash channel and show the relationship of the proposed mining to the hydrology of the adjacent area. They show the extent of the pits and overburden removal, the location of the Sink Valley Fault and Tropic Shale Ridge, and the general extent and thickness of the coarse sediments where groundwater flow is more likely. Drawing 7-15B also indicates the potentiometric surface, and Plate 2 depicts a Compacted Shale Barrier on cross section E-E'. Plates 1 and 2 of Appendix 7-9 and A7-10 Plates 1 and 2 are similar cross section that illustrate the contingency plan for keeping groundwater out of the pits and the reclamation plan for sealing the pits from the adjacent aquifers.

Permit Area Boundary Maps

Previous task 2910 deficiency: R645-301-521.132, *"The Applicant must update all permit area boundaries to show that the access road from the closed section of County Road 136 to the mine site will be within the permit area."*

The Permittee responded to the above deficiency in this manner: *"The section of road from the permit boundary, north to the road relocation point will remain under the jurisdiction of Kane County and will be maintained by the County as a public road. For details related to this road status, refer to Appendix 1-7; the Kane County Road K3900 (136) Closure, Relocation and Replacement Agreement, Miscellaneous Provision C, Page 7. Since this section of road will continue to be a public road under the jurisdiction of Kane County it is not included as part of the permit area in this application. All drawings showing the closure point of this road and access to the facilities area are modified to be consistent with this agreement."*

The Division is responsible for approving or disapproving coal mining permits in the State of Utah (R645-300-112.100). Drawing 1-4 Coal Ownership indicates that Kane County road #136 traverses private coal and Federal / BLM coal. The Division is responsible for the backfilling, grading and compaction of spoil within the County road #136 right-of-way as well as areas on either side of the 66 foot wide County Road R. O. W.

Surface and Subsurface Manmade Features Maps

Only two man-made surface and sub-surface features have been identified within the proposed Alton permit area (Page 5-8, Chapter 5, Section 521.122).

The Kane County road #136 (feature #1) is identified on Drawing 5-3.

Page 5-9, Chapter 5, Section 521.124 of the Task ID # 3100 application states that there is one impoundment located within the permit area (Pond 20-1). Pond 20-1 is shown on Drawing 7-7. The surface area of this impoundment is 3,400 square feet.

There are no other areas of existing spoil, waste, coal development waste, and noncoal waste disposal, dams, embankments, other impoundments and water treatment, and air pollution control facilities within the permit area.

Drawing 7-7 is P.E. certified by a Utah registered professional engineer.

Surface and Subsurface Ownership Maps

The Applicant met the requirements of this section. The Applicant provided Drawing 1-3 Surface Ownership and Drawing 1-4 Coal Ownership, which show surface and coal ownership.

Subsurface Water Resource Maps

Ground-water resources consist of both springs and wells. Artesian conditions have been documented in several wells, and some have sufficient head to flow. 7-13 shows the potentiometric or water-table elevations of the alluvial ground-water system. This is somewhat deceptive because it does not relate ground water to the surface topography, i.e., it gives the impression of a fairly uniform subsurface water table, whereas the data show springs and seeps, flowing wells, and areas of confined and unconfined conditions, and two areas where ground water flows to the surface. Figure 13 of Appendix 7-7 has been added to show the potentiometric elevations in relation to the surface elevation.

Surface Water Resource Maps

The locations of streams, stock watering ponds, and conveyance ditches in the proposed Coal Hollow Mine permit and adjacent area are shown on Drawing 7-7.

Archeological Site Maps

These are included in the Data Recovery plan in the confidential section of the application.

Cultural Resource Maps

These are included in the Data Recovery plan in the confidential section of the application.

Monitoring and Sampling Location Maps

Drawing 3-1 includes the vegetation monitoring and reference area locations permit area boundary and coal ownership boundaries.

Permit Area Boundary Maps

Drawing 3-1 includes the vegetation monitoring and reference area locations permit area boundary and coal ownership boundaries.

Vegetation Reference Area Maps

Drawing 3-1 includes the vegetation monitoring and reference area locations permit area boundary and coal ownership boundaries.

Affected Area Boundary Maps

Affected area boundary maps for vegetation and fish and wildlife information are located in Volume 3, Chapter 5, Plates 5-1, 2, 9, 10, 13, 14, and 5.

Findings:

Maps, Plans and Cross Sections of Resource Information are sufficient to meet the requirements of the Coal Mining Rules.

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MINING OPERATIONS AND FACILITIES

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

Analysis:

The Division received a comment that the Operation Plan is not specific to local hydrologic conditions nor does it address potentially adverse hydrologic consequences because the PHC is not complete. As discussed in this and other Tech Reviews, there are deficiencies in the baseline data and in the PHC that need to be addressed, but these deficiencies are not fatal flaws that have precluded the Applicant from formulating an Operation Plan. The Operation Plan submitted by the Applicant is based on valid baseline data and a reasonable draft PHC determination. All three elements are subject to revision as the deficiencies are addressed by the Applicant.

The Applicant did not meet the general requirements of this section. Those general requirements include:

- In Section 523 the Applicant described the type of coal mining procedures, anticipated annual and total production of coal, by tonnage, and some major equipment they will use for all aspects of those operations.
- In Section 536, Section 528 and Section 553 the Applicant described the construction, operation and reclamation of the mine facilities. The Division will analyze specific facilities in other sections of the Technical Analysis (TA).

The Applicant has described a 2MT, 24 hr/day 6 day/week operation in Introduction to the PAP. In consultations with the Governor's Office in 2005 and with the DEQ and DOGM in 2007, the Applicant described a 2 MT, 2 shift/day, 6 day/week operation. As explained to the Governor's Office in 2005, the initial decision for a 2 shift work day was made to avoid night sky issues that were raised in the Cecil Andrus 1980 Suitability decision (Ex. 3, App. 1-3). The night sky issue has been raised by commenters during the recent public comment period and by the USFS and Bryce Canyon National Park in comments provided to the Division. The application must explain the equipment required for lighting the 24 hour operation and the effect on the night sky as seen from Bryce Canyon National Park and the Dixie National Forest.

- Section 526.220 has been revised to include a list of anticipated lighting equipment that would likely be used to illuminate the night mining operations. The Division will analyze the list of specific equipment under the Support Facilities and Utility Installations section of this TA.

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- However the Applicant has not discussed the effect on the night sky as seen from Bryce Canyon N. P. and the Dixie N. F. Therefore, this deficiency remains and must be addressed prior to receiving a recommendation for approval.

This issue was specifically raised in comments sent to the Division of Oil Gas and Mining by the public and from the District Ranger of the Dixie National Forest (2008/Incoming/0048.doc).

Such issues were also the subject of discussion in the federal unsuitability decision made for surface mining of federal lands within T 39 S, R. 5 W. by Cecil Andrus, Secretary of Interior's on December 16, 1980 (App. 1-3, Ex. 1). Secretary Andrus specified in items 5 and 6 of the unsuitability determination that any future specific mining plan or permit application for surface mining of the other federal lands in the Alton Coal field should be reviewed for visibility, vibration, and noise issues by the Department of Interior (through the National Park Service and the Office of Surface Mining) to determine whether specific conditions or stipulations should be placed on the permit. The Secretary stressed that the unsuitability designation was not "the only basis for protection of the values for which Bryce Canyon National Park was established," and directed the Department of Interior to take Park values into account in future decisions on undesignated federal lands near the park. For surrounding federal lease areas, these issues are being reviewed by the BLM in the Draft Alton Coal Tract LBA Environmental Impact Statement (EIS).

Findings:

The information provided in the application is adequate to meet the Utah Coal Mining Rules for this fee coal mine permit.

EXISTING STRUCTURES:

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

Analysis:

In Section 526.100 of the PAP, the Applicant states that there are no existing structures within the permit area.

Findings:

The information provided in the application is considered adequate to meet the requirements of this section.

PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

Regulatory Reference: 30 CFR 784.17; R645-301-411.

Analysis:

Lands to be disturbed by coal mining and reclamation are not "unsuitable" as defined by 40-10-24(4) of the Act. Coal mining and reclamation operations would not adversely affect any publicly owned park or any place included in the National Register of Historic Places (R645-103-326). SHPO provided concurrence (7/14/08) on the Cultural Resource Management Plan (CRMP) and Data Recovery plan for seven archaeological sites that will be adversely affected. The CRMP and Data Recovery plans are found in Confidential App. 4-1.

Findings:

The information provided in the application meets the requirements of this section.

RELOCATION OR USE OF PUBLIC ROADS

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

Analysis:

Section 526.116 has been revised to clarify that Kane County will take charge of the County Road 136 (K3900) re-alignment onto adjacent federal land during mining and restoration of K3900 to its approximate original alignment upon final reclamation of the proposed mine. Appendix 1-7 provides the details of that agreement.

One public comment received during the June 2008 Informal Conference concerning the livestock protection (fencing, cattle guards) along the road has been incorporated into the details of the County Road Agreement. That portion of K3900 extending from the relocation point to the mine permit boundary will be maintained by the County and continue to provide access for landowners, as required by R645-301-521.133.

Kane County will be solely responsible for the construction of the temporarily, re-aligned segment of County road #136 (K3900) during the coal recovery operation.

Alton Coal Development, LLC. is responsible for coal recovery, backfilling, compaction and reclamation activities in the right-of-way and adjacent areas of Kane K3900, to create a stable fill for final re-construction of K3900 in its approximate original alignment. These backfilling and compaction activities fall under the jurisdiction of the Division. At this time, the Division is not certain if backfilling and compacting of the weathered Tropic Shale can meet sub-grade specifications such that K3900 can be re-constructed in its approximate original

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location. Consequently, the Division has asked that additional information be provided under Reclamation Plan/Road Systems section of this TA.

As required by R645-103-234 for relocation and closure of a public road, the Division placed a notice in the Southern Utah News on March 25, 2009 notifying the public of the proposed temporary road relocation for K3900. Appendix 1-7 indicates that the County will also provide for a public hearing on the K3900 road relocation.

County Road K3993 (which parallels Lower Robinson Creek on private land held by Pugh) will be closed for the life of mine. This road closure was included in the March 25, 2009 public notice as well.

Findings:

The information provided in the application is considered adequate to meet the requirements of this section.

AIR POLLUTION CONTROL PLAN

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

Analysis:

The Applicant is required to obtain an Air Quality Approval Order prior to receiving a permit to mine. The first step in acquiring an Air Quality Approval Order is to file a Notice of Intent with the Utah Division of Air Quality (DAQ).

One comment received indicated that the Applicant had not filed a Notice of Intent with the Utah Division of Air Quality (DAQ). However, the Permit Application Package indicates that Alton Coal Development, LLC provided the DAQ with a Notice of Intent (NOI) on May 8, 2007 (Section 422 and Appendix 4-2). On July 2, 2008, Maung Maung of the DAQ confirmed that the NOI had been received in May 10, 2007, and review is pending. The NOI provided to the DEQ/Division of Air Quality on May 8, 2007, listed 60 acres overburden stockpiles, and 3.35 acres coal stockpile, but did not describe the 17 acres topsoil, the 87 acre spoil pile and approximately 70 acre open pit working area. The NOI has been removed from the application.

Several comments were received during the public comment period and during the informal conference that the ambient and fugitive dust might degrade the characteristic clear skies of the area; that the fugitive dust might affect water quality of nearby streams and perhaps the groundwater; and that uncovered haul trucks might leave coal fines in their wake.

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The application states in Section 521.168 (p. 5-15) that there are “no specific air pollution collection or control facilities proposed.” Public concerns are partially addressed by the Applicant’s fugitive dust control plan found in Appendix 4-5, required by R645-301-423. The plan will stabilize exposed surface areas (R645-301-244.100); will minimize and control erosion of regraded areas (and topsoil and subsoil piles) and will control sediment contributions to streams from stockpiles (R645-301-244.320 and R645-301-526.220, *et seq*), using tackifier or surface roughening, mulch, and vegetation (R645-301-244.300).

The App. 4-5 fugitive dust control plan includes the following:

- Mulch or tackifier application for unseeded topsoil/subsoil stockpiles.
- Seeding of topsoil stockpiles in existence longer than one year.
- Tackifier on graded, unseeded reclamation areas.
- Water sprays (as needed) for material handling points (crushing, screening, transfer, loading, dumping); for excavation and pushing activities; for construction and demolition; for drilling and blasting; and for cleared areas.
- Water sprays or chemical treatment or gravel as needed on unpaved roads and yard areas.
- Synthetic cover on haul truck beds as needed.
- Coarse gravel at entrances to and exits from public roads.

The App. 4-5 monitoring program includes the following:

- The site supervisor will periodically observe the dust at the permit boundary to determine the level of control needed.
- 0 – 5% opacity at the permit boundary triggers increased watering frequency and an application of magnesium chloride on the Out of Pit haulroads.
- 5 – 10% opacity will result in even more water and/or magnesium chloride applications
- Greater than 10% at the permit boundary triggers increased watering frequency and an application of magnesium chloride on the Out of Pit haulroads.
- Production will stop if dust can not be reduced to 5 – 10% opacity.
- Records of watering will be provided in the Annual report.

The monitoring program specifies that EPA Method 9 will be used along the permit boundary to determine opacity from fugitive dust, non-point sources such as spoil piles, open disturbed areas, pits, etc. Jon Black of Utah DAQ, indicated that EPA Method 9 was occasionally used for fugitive dust control, although it is more frequently used for point source evaluations. Chris McCourt agrees with the difficulty of using method 9 for fugitive dust monitoring and said that he and his consultant struggled with this issue (personal communication 10/7/2009).

Findings:

The information provided in the application may meet the requirements of the Air Quality rules for **R645-301-423.200**, however, the Division does not provide training for permitting staff or inspectors in the application of EPA Method 9. Consequently it is recommended that the Division request that the Utah DAQ evaluate this fugitive dust control plan prior to issuance of the air quality permit, under the auspices of the MOU to cooperate for the purposes of permitting, signed on September 1, 1999.

COAL RECOVERY

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

Analysis:

The minimum regulatory requirements of this section are as follows;

“Underground mining activities shall be conducted so as to maximize the utilization and conservation of the coal, while utilizing the best technology currently available to maintain environmental integrity, so that re-affecting the land in the future through surface coal mining operations is minimized”.

Drawing 5-9, Coal Extraction Overview, indicates that the Applicant intends to leave approximately 1,207,000 tons of coal beneath the highwall.

Section 523, Mining Methods of the permit application package does not discuss coal recovery beneath the highwall by any method.

A review of Drawing 5-9 indicates a distance of approximately 100 feet or more between the surface mining coal extraction area and the proposed permit boundary for Coal Hollow.

Drawing 1-4 Coal Ownership indicates that the proposed permit area for the Coal Hollow project is surrounded by Federally owned coal on all sides, with additional Fee coal on the east side.

Alton Coal Development does not intend to recover reserves remaining under any of the highwalls for the following reasons;

- 1) There is 1,207,000 tons of coal between the highwalls and the proposed permit boundary for the Coal Hollow Mine. Of this, 678,000 tons will be recovered by surface mining methods along the west and southern permit boundaries, as mining in

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those directions proceeds through the Federal leases. The Permit Applicant has added text to Section 522 of the PAP to clarify this coal recovery.

- 2) The recovery of the remaining 529,000 tons would be affected by the low efficiency / production rates of auger mining. The low production rates of augering would affect the efficiency of the overburden removal process / coal recovery process of the surface mining operation.
- 3) The geologic conditions and the structures located along the eastern permit boundary would only allow a 40 % recovery of coal reserves from beneath those highwalls. This coal volume (112,000 tons), does not justify the capital expenditure for the augering equipment and the mobilization cost. Also, there will not be any opportunity to utilize the augering method of coal recovery in the adjacent Federal coal reserves until the final pit.

The Permit Applicant has provided adequate justification as to why additional coal recovery from beneath the Coal Hollow highwalls will not occur.

Findings:

The Permit Applicants response adequately addresses the requirements of **R645-301-522, Coal Recovery.**

SUBSIDENCE CONTROL PLAN

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

Analysis:

The Applicant met the requirements of this section. The Applicant will not subside any areas within the permit boundary because they will not use underground mining methods.

Findings:

The information provided in the application is considered adequate to meet the requirements of this section.

SLIDES AND OTHER DAMAGE

Regulatory Reference: 30 CFR Sec. 817.99; R645-301-515.

Analysis:

The Applicant met the requirements of this section. In Section 515.100 of the PAP, the Applicant described the procedures for contacting the Division in the event of a slide, which may have a potential adverse effect on public, property, health, safety or the environment.

In Section 515.200 of the PAP, the Applicant described the procedure for contacting the Division in the event that the Applicant's inspection of an impoundment they discover a potential hazard.

Findings:

The information provided in the application is considered adequate to meet the 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

Procedures to minimize adverse impacts to fish and wildlife are included in Volume 2, Chapter 3, Section 333, pages 3-40 through 3-43 and appendices 3.1 and 3.3 of the submittal received in June of 2007 and Chapter 3, Section 333, pages 3-42 through 3-49 and appendix 3-5 of the submittal received in December of 2008.

Protection

A protection and enhancement plan is located in chapter three, pages 3-44 to 3-55. The plan includes commitments by ACD to protect the local sage grouse population by implementing the following:

- Enhance current sage-grouse habitat by reducing juniper trees in the area and restoring desirable perennial plant species.
- Create a conservation area for the sage-grouse that will never be mined.
- Provide a corridor between north (Hoyt's Ranch) and south (Alton Sink Valley) populations to promote gene transfer and increase population numbers.
- Use decoys to shift breeding activities to alternate lek sites in Sink Valley.
- Restore the Alton lek site to its original ecological structure and function.
- Monitor sage-grouse distribution patterns at both Alton and Hoyts Ranch.
- Restore sagebrush communities disturbed by mining activities to enhance sage-grouse habitat.

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- Control predators through cooperation with official state and/or federal predator control agencies and organizations.

Page 3-43 of the permit application package states, "...mining activities will be minimized so that the lowest disturbance will be created during the breeding season at areas adjacent to the original lek". The term "minimized" is subjective and "lowest disturbance needs to be defined. Technically all areas adjacent to the lek will be disturbed. The Division would like to clarify this perception that ACD has to shut down in order to avoid the lek during breeding season. The objective here for both the Division, and presumably the applicant, is to schedule the advancement of the surface mining activities through the lek when the lek is not occupied by courting sage grouse. The lek will be unoccupied for 10 months out of the year and ACD will have 2 years of mining to determine the rate of advancement. This would essentially provide ACD a 10-month window of opportunity to mine through the lek.

For more extensive sage-grouse discussions with agencies, ACD has committed to consult with the Division 6 months prior to mining through the lek to determine an appropriate strategy to minimize impacts to the birds during the breeding season on page 14 of appendix 3-5.

Anthropomorphic disturbances and occupation such as surface mining can artificially increase the occurrence and populations of native and non-native predators such as red fox, ravens, and perching raptors. These predatory species can greatly impact sage grouse populations. The Predator Control plan for sage grouse is listed on page 3-48 of the M&RP and page 14 of appendix 3-5. The plan states that several species, including ravens, crow and coyotes prey on sage grouse eggs chicks and adults.

The plan also has protection and enhancement measures on page 3-54 for high value habitat within the project area. This includes the following:

- ♦ The employee awareness program included in chapter three of the application page 3-54 includes information that adequately addresses the management of mining activities to minimize predation.
- ♦ Speed limits of all vehicles will be posted at 25 mph inside the permit area.
- ♦ The safety meetings conducted on the mine site to all employees will include information regarding awareness of important wildlife species in the area.
- ♦ Measures for protecting and enhancing habitat for sage grouse have been conducted and these measures will be beneficial to other wildlife species including mule deer, elk and bear.
- ♦ The operator will keep log records of any road kill of deer, elk, sage grouse or domestic livestock from coal haul or other vehicles from the mine site to highway 89. This will help initiate the quick cleanup of roadkill to prevent additional wildlife kills.

Enhancement

There is a given assumption that wildlife species will be displaced during the active phase of mining operations. In the case of surface mining, ongoing reclamation measures are intended to offset the displacement or restore the habitat as an enhancement measure beneficial to certain wildlife populations. DWR has changed the "high value" habitat delineation to "crucial" and the applicant has revised the text in chapter three and the habitat maps accordingly. The text on pages 3-51 and 52 includes a description of the benefits to these wildlife species from the development of the Sage grouse Conservation Area and 1700 acre PJ removal corridor. According to DWR, (personal conversation with Dustin Schaible 10/01/2008), the deer, elk and bear would habituate to the proposed mining activity and not be negatively impacted by the temporary disturbance. They would also benefit by the proposed and ongoing pinyon juniper removal projects. ACD will disturb 139 acres of wildlife habitat and has committed to restoring and enhancing 300 acres upon reclamation.

The focus of the current application for protection and enhancement is the Greater Sage Grouse, listed as a sensitive species by the DWR heritage group and a candidate species by the USFWS. Appendix 3-1 "Alton Sage-Grouse Habitat Assessment and Mitigation Plan," and Appendix 3-3, "Sage-Grouse Distribution and Habitat Improvement, Alton, Utah," Appendix 3-5 "*Alton Sage-Grouse Habitat Mitigation Plan*," and Section 333 of Chapter 3 are the main documents included in the review of this section of the regulations.

Appendix 3-5, "Alton Sage-Grouse Habitat Assessment and Mitigation Plan"

The sage grouse is of special concern with this permit because crucial breeding habitat exists directly on the project area to be mined. The data obtained from comparing potential sites the existing leks and roost sites indicate that they have enough similarity that they could be used for new breeding and roosting areas. Appendix 3-5 is the most recent submittal of the sage grouse protection and enhancement plan.

1. Minimize impacts to the birds from mining activities

The application includes a methodology for relocating the birds to these alternative sites as noted on page 12 of appendix 3-5, appendix 3-1 and page 3-43 of chapter 3. "During the mating season decoys and calls will be used to lure the birds to alternative lek sites". DOGM and DWR support the decoy idea; although there is limited scientific literature to assure the idea will work. The failure during 2008 indicates that this mitigation needs methodology improvements. In the spirit of full disclosure, this document needs to include a short summary of that effort and detail exactly how the applicant intends to improve the technique. For example, the idea to include white markings on the decoys may not work, and is based on one or two anecdotal examples. Adding white might deter the birds. It is suggested that the application includes a simple experimental design to test the techniques before excavating the lek. This could be conducted on alternative populations, but needs to be attempted on site this season. Appendix 3-5, page 12 describes and references research that has shown this method of decoys

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and recorded calls to be effective at luring birds to alternate sites. Both silhouette and 3-dimensional decoys (with bright colorations) will be used. ACD has committed to notify the Division 30 days prior to beginning the decoying on page 12 of appendix 3-5. Appendix 3-5, page 12 describes and references research that has shown this method of decoys and recorded calls to be effective at luring birds to alternate sites.

The location of the current lek as well as the potential alternative sites is located in appendix 3-1. A map is included on page 18 of this appendix.

The second action that may minimize impacts to birds is to stockpile spoils from mining operation up to 20 feet higher on a ridgeline, which may create a more distinct visual barrier than currently exists. This barrier between the mining activities and the conservation area may benefit the birds by blocking the view of human activities and may reduce noise levels.

It was a concern of the Division, however, that the berm could act as a perch for predators. In a site conference with the Division, ACD and consultants, it was determined that the advantages of the berm far outweighed the disadvantages.

2. Enhance current sage-grouse habitat

The Plan cites a study in Oregon by Bates et al. (2000) which found a significant improvement in understory productivity and diversity after removal of juniper trees, the Plan includes a comparison of the Alton site to the site in the Bates paper to determine if similar results be expected. It was determined that the Alton sage-grouse population should have similar results to those found in several studies cited in appendix 3-5.

Page 7 of appendix 3-5 includes a plan to reduce juniper trees within key habitats in the Alton area. Numerous studies as well as data from radio-collared birds within the Alton area suggest that sage grouse do not use juniper encroached sagebrush sites for nesting or brood rearing. Quantitative sampling was conducted in the pinyon/juniper and sagebrush plant communities in the Alton area in order to compare these areas to ideal sage-grouse habitat standards. The tree removal was completed using bullhogging technology and radio-collared birds were found using the newly enhanced areas. Future tree removals could be required as mitigation for future leases. The plan includes a commitment to conduct tree removal activities outside of the avian nesting season to avoid the take of eggs or young of other migratory birds. This commitment is located on page 11 of appendix 3-5.

The Plan contemplates mechanical sagebrush treatments in addition to removal of juniper, pine and Gambel oak; however, under certain conditions, removal of sagebrush can be detrimental to sage-grouse. Shrub treatments are to occur in stands that have higher shrub cover than levels recommended by Connelly (2001) for nesting and Brood rearing. The Division supports the concept of improving the sagebrush habitat by selective thinning and or creating open patches in some of the denser stands of sagebrush. Appendix 3-5 under "establishment of a

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Core sage–grouse conservation area” and “Reduction of Juniper trees within key habitats of the Alton area” includes commitments to survey the vegetation after treatment.

3. Create a conservation area for the sage-grouse that will never be mined

The third goal is to establish a core sage-grouse Conservation Area that will be protected from all mining activities. The Plan specifies the location, size and current condition of the areas in appendix 3-1, 3-3 and 3-5. The conservation area is 72 acres and has been determined adequate for roosting, and potentially nesting and brood rearing according to page 5 of appendix 3-5. Page 3-48 includes information on how the conservation area will be enhanced for Sage Grouse especially during the breeding season. Mechanical sagebrush treatments will be applied, in addition to juniper and oak removal, to reduce shrub cover and density in small areas if needed for sage grouse habitat requirements. Nikki Frey, professor of wildlife biology, has confirmed that sage grouse have been seen using the conservation area. The site visit on October 1, 2009 has indicated that there is ample roosting habitat in the sagebrush within the conservation area and adjacent to the conservation area in the sagebrush and adjacent pinyon juniper areas, (personal conversation with Dr. Steven Peterson 10/01/2009). In addition, during the visit, it was noted that intact sagebrush sites, located in the conservation area, have been cleared of all young juniper trees. With the concurrence of the Division, the long term plans to remove additional acres of Juniper will be considered if the additional coal leases are acquired.

The removal of 8,000 trees that were encroaching the sagebrush community has been completed. The current and continued monitoring regimen will assist in determining how the birds are habituating to the advancement of the surface mining activities and an accurate estimate of the distance the birds are from the activities.

ACD has committed to notifying the Division six months prior to mining the lek. At this time, the necessary agencies and ACD will agree on the best methods to protect the sage grouse during mining.

The Plan anticipates the removal of trees from the Conservation Area, suggesting there is some ability to improve the habitat quality for sage-grouse. We recommend a bullhog for tree removal (see earlier comments) and that these activities occur outside of the breeding season. The Plan mentions several uses within the Conservation Area including roosting, breeding and nesting. Nikki Frey, professor of wildlife biology, has confirmed that sage-grouse have been seen using the conservation area.

4. Provide a corridor between north (Heut’s Ranch) and south (Alton Sink Valley) populations to promote gene transfer and increase population numbers

The fourth goal is to reestablish connectivity of the grouse populations between the Alton and Heut’s Ranch by removing juniper trees from approximately 1700 acres of land between

these two areas. Existing studies show that there is already some movement of birds between Alton and Heut's Ranch; therefore, this action may increase future movement and/or genetic diversity. One of the purposes of this action is to facilitate a more rapid recovery of the Alton grouse population after the mining is completed (i.e., through greater connectivity) ACD will continue to offer financial and technical support to the ongoing development of the connectivity corridor. This process is dynamic and ongoing. The bird monitoring data shows that the birds are currently using the corridor, and have been seen in the steeper areas where the birds are supposedly using the areas for transportation. Karl Heaton, the property owner, verified that the habitat improvement for the birds is an ongoing process. As new mosaics of predominately sage, grass and forb communities are being developed; older 20-30 year treatment areas need additional treatment. ACD will submit sage-grouse population monitoring results taken by DWR each year in the annual report. The division recommends that junipers be removed with a bullhog that grinds the trees rather than pulling and removing them. ACD has committed that future tree removal activities will occur outside the avian nesting season.

The original application included this statement, "The Alton Sage-Grouse population will be enhanced by importing birds from nearby populations that are relatively large and stable." However, this practice is currently not supported by DWR although it has been successfully accomplished at Strawberry Reservoir. Therefore, the applicant deleted this proposed enhancement.

5. Restore land disturbed by mining activities to enhance sage-grouse habitat

The Plan calls for returning the vegetation to pre-mining conditions; however, if there is an opportunity to improve habitat conditions, that should be explored Bareroot and containerized plants in addition to forbs seed will be used according to the plan and Appendix 3-5.

The applicant has indicated that, "The mine will rely on the DWR to obtain accurate lek counts each spring and to assist the mine in monitoring sage-grouse population patterns during mining activities". The application includes a commitment on page 14 of appendix 3-5 to provide the Division with the results of monitoring during the reclamation liability period in the annual report. In March 2009, 15 sage-grouse (14 males and 1 female) were collared from the Hoyts Ranch area and are being monitored.

Page 23, paragraph 3, Pages 3-48 and 3-74 of the application describes the monitoring and mechanical treatment controls of invasive species.

Appendix 3-1, and 3-3, "Sage-Grouse Distribution and habitat improvement Alton, Utah"

This document includes a mitigation plan to improve sage-grouse habitat, increase bird population levels and maintain optimal habitat for nesting, brood rearing and summer and winter

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use. Appendix 3-5 is considered the final sage-grouse mitigation plan, but this appendix provides useful information pertaining to the local sage-grouse population in the Alton area.

Endangered and Threatened Species

Threatened, Endangered, and Candidate plant and animal species for Kane County are included in table 3-35. As noted in Section 322.210 A narrative for each species describing the rationale for their absence and surveys conducted to verify such is included in Appendix 3-4 page 5 the application.

Threatened and Endangered Plant species are generally described in Appendix 3-4 page 5.

Colorado Fish Recovery Program

According to the information in the application, the proposed mining operations are not located within the boundaries of the Upper Colorado River Basin. Therefore, the application would not need to include mine water consumption calculations in acre feet per year for the four endangered fish species included in the Colorado Fish Recovery program.

Bald and Golden Eagles

Page 3-40 of the application includes a narrative about raptor surveys conducted for the coal hollow area. Surveys were conducted by DWR in 2006 through 2008. No golden or bald eagle nests were located within ½ mile of the project area. The closest raptor nest was an inactive red tailed hawk nest approximately one mile from the permit boundary.

Wetlands and Habitats of Unusually High Value for Fish and Wildlife

Wetland areas are described on page 3-73 of the application and chapter 7. According to the application there are wetland areas in the permit area. Page 3-73 refers the reviewer to page 3-40 of the application for protection measures for these areas. . Portions of the areas themselves will be removed during mining and replaced at reclamation. The source of the water providing flow to these areas will not be impacted as it is located to the east of the proposed disturbance. Accordingly, flow will be restored to these areas.

Findings:

The focus of the current application for protection and enhancement is the Greater Sage Grouse, listed as a sensitive species by the DWR heritage group and a candidate species by the USFWS. Appendices 3-1, "Alton Sage Grouse Habitat Assessment and Mitigation Plan," 3-3, "Sage-Grouse Distribution and habitat improvement Alton, 3- 5 "Alton Sage-Grouse Habitat Mitigation Plan" and Section 333 of Chapter 3 are the main documents included in the review of

this section of the application. These findings include consultation with the DWR and FWS. The information is adequate to meet the requirements of this section of the regulations.

TOPSOIL AND SUBSOIL

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

Analysis:

Topsoil Removal and Storage

Mine pits and mining sequence are described in Section 523. Overburden removal is shown on Dwg 5-16. Operational sequence and contemporaneous reclamation sequence is shown on Dwg 5-17 through 5-19.

The topsoil salvage operation is described in Section 231.100 through Section 233.100-400 and in Section Four of Appendix 2-1. Table 4-2 of Section Four in Appendix 2-1 provides the average topsoil salvage depth and the subsoil salvage depth by map unit. The topsoil salvage depth ranges from 5 to 10 inches. Subsoil suitability varies due to high pH, clay content, and carbonate accumulations. The suitable subsoil salvage depth ranges from 1 to 55 inches. Due to this wide variation in suitability of subsoil the application states that topsoil and subsoil salvage will be monitored as described in Section 232.500 and Section 231.100 and Appendix 2-1, p. 4-2 under the direction of a certified soil professional.

Dwg. 2-2 indicates salvage and stockpiling from less than half of the permit area, with the rest of the topsoil being live-hauled to contemporaneous reclamation sites. Table 4-5 provides the expected topsoil and subsoil recovery by year and acreage disturbed. Tables 4-3.1, 4-3.2, 4-3.3 provide similar information by map unit and acreage. Table 4-4 provides topsoil and subsoil salvage for facilities construction. According to plan (Section 232.500), topsoil and subsoil from year one facilities construction areas will be stockpiled as shown on Drawing 2-2.

Three topsoil stockpiles and a subsoil pile will be located as shown on Drawing 2-2. Dwg. 2-2 describes the average depth and footprint area for each stockpile. From the information on Dwg 2-2, the combined volume of topsoil stored in stockpiles is 302,000 cu yds, of which 188,000 cu yds is topsoil. Stockpiled soil will be placed such that side slopes will not exceed 3h:1v and the piles will be bermed. The piles will be seeded with an interim mix of grasses described in Section 234.230. All totaled, the stockpiled soil will cover 17.5 acres.

Stockpiles in place for less than one year will be treated with tackifier to control fugitive dust. Stockpiles in place for more than one year will be surface mulched and seeded (Section 231.100). The Applicant states in Section 234.230 that other measures approved by UDOGM may be implemented to provide stockpiles protection from wind and water erosion. In Section

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244.100, the Applicant states that stockpiles will be roughened by pocking, gouging or ripping to control erosion.

Findings:

The information provided in the application meets the requirements of the R645 Coal Rules for Soils Handling Operation Plan.

VEGETATION

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

Analysis:

Vegetation communities are described in Volume 2, Chapter three of the application. The descriptions include acreage, percent of total by community, total living cover, percent cover by shrubs, grasses, forbs and woody plant species, for;

- The proposed Disturbed Sagebrush/Grass Community
- The Sagebrush/Grass Reference Area
- The Proposed Disturbed Meadow (Dry) Community
- The Meadow (Dry) Reference Area
- The Proposed Disturbed Pinyon-Juniper Community
- The Pinyon-Juniper Reference Area
- The Proposed Disturbed Pasture Land Community
- The Pasture Land Reference Area
- The Proposed Disturbed Oak brush Community
- The Oak Brush Reference Area
- The Proposed Disturbed Meadow Community
- The Meadow Reference Area
- Other Meadow Communities

Tables 3-1 through 3-33 include living cover and frequency by plant species, total cover and composition and woody species density. Table 3-34 includes "Biomass Production of Plant Communities in the Coal Hollow Permit Area". These figures are represented in pounds per acre for each community.

Appendices 3-2 and 3-4 include the methodologies, (maps, sampling design and transect/quadrat placement, cover and composition, woody species density, sample size and adequacy, statistical analyses, photographs and threatened and endangered plant species), results, summary and discussion and color photographs for the referenced communities.

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On page 15, Threatened & Endangered Plant Species Survey, the applicant needs to include a description of the T&E plant species survey, and a narrative that describes the species, location, elevation, soil type, moisture requirements, and the presence or absence of each species. Threatened and Endangered Plant species are described in Appendix 3-4 page 5. The reviewer is referred to Chapter 3, Section 333, Procedures to Minimize Adverse Impacts to Fish and Wildlife. There is no information in this section that describes the protection and enhancement measures for wet meadow areas.

Findings:

The information is adequate to meet the requirements of this section 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 has classified two roads for the coal extraction process; "Year 1 and 2 Mine Haul Road", and "Year 2 and 3 Mine Haul Road". This road classification is discussed in section 527.100, Chapter 5, page 5-33. These roads will provide access into and from the mining pits during the coal extraction process. Drawings 5-22 and 5-23 show details of the two haul roads.

The "Facilities Roadway," is the access to the mine facilities area and is described as a primary road. Details of this road are depicted on Drawing 5-22A and 5-22B.

Section 527.100 classifies seven individual roads as primary. Drawings 5-22A through 5-22G have been added to show details for primary roads. Drawings 5-35 and 5-37 have been revised to show the post-mining roads along with the post-mining topography.

The Sink Valley Road, K3900, is a Class "B" road under RS2477 designation.

Plans and Drawings

Appendix 1-7 includes information about the relocation of County Road 136.

The Applicant has updated Drawing 5-23 to be consistent with the description provided in 534.100-200. Typical Cross Section NTS contains a note below the cross-section; "18 " (inches) of Crushed Rock or Gravel to be Placed".

The Applicant is required to include plans and drawings for each road that contain the following:

- A map, appropriate cross sections, design drawings, and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, low-water crossings, and drainage structures. The Applicant shows the basic designs for the primary roads in Section 527.170 and on Drawing 22 and Drawing 23. The Applicant provided the information listed above. For clarity each roads must have it own identification name or number.
- Drawings and specifications of each proposed road that is located in the channel of an intermittent or perennial stream. The Applicant gave the designs for the stream crossings in Section 527.170 and on Drawing 22 and Drawing 23.
- Drawings and specifications for each proposed ford of perennial or intermittent streams that are used as a temporary route. The Applicant does not propose to have temporary routes thru perennial or intermittent streams.
- Measures to be taken to obtain approval of the Division for alteration or relocation of a natural stream channel. In Section 527.220 of the PAP, the Applicant states that there will be no stream diversions for road construction. The Applicant then goes on to state that a permanent diversion will occur in Lower Robinson Creek, consistent with information presented on Drawing 22. The Applicant should modify the comment in Section 527.200 of the PAP to acknowledge that were will be a permanent diversion in Lower Robinson Creek to allow for maximum economic recovery, but not to facilitate road construction.
- Drawings and specifications for each low-water crossing of perennial or intermittent stream channels. In Section 534.100-200 of the PAP, the Applicant states that they will not do such activities.

In addition to the above, the Applicant will provide primary roads shall meet the following requirements for primary roads:

- A qualified registered professional engineer shall certify the construction or reconstruction of primary roads in a report to the Division. The certified designs are on Drawing 22 and Drawing 23.
- Each primary road embankment shall have a minimum static factor of 1.3. The Applicant states in Section 534.100-200, that all embankments have been designed with a 1.3 static safety factor.
- Primary roads shall be located to minimize erosion, insofar as is practicable, on the most stable available surface. In Section 534.100-200, the Applicant states the design plans. The Applicant complied with the general rules that are designed to help insure the above mentioned requirements are meet.

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- Fords of perennial or intermittent streams by primary roads are prohibited unless the Division specifically approves them. The Applicant does not plan to use fords in any stream.
- Each primary road shall be constructed or reconstructed, and maintained to have adequate drainage control. The Division considers that those general requirements have been met if the hydrology requirements have been met.
- Primary roads shall be surfaced with material approved by the Division as being sufficiently durable for the anticipated volume of traffic and the weight and speed of vehicles using the road. The Applicant was not consistent with the description of the road surface. In Section 534.100-200, the Applicant stated that eighteen inches of crushed rock or gravel would be used for road surfacing. On Drawing 23, the Applicant does not list eighteen inches of road surface and states that gravel will be placed as needed.

The Division received several comments about truck travel through Panguitch. Some people would prefer that the truck traffic be routed around the town either by having the Applicant use alternative routes or by have a bypass road constructed. The Division does not regulate truck travel on public roads. The Division will forward the comments onto the Department of Transportation.

The Division received comments about commitments that the Applicant allegedly made about constructing a bypass road around Alton. The Applicant did not include that information in the submittal. The Division does regulate truck traffic on public roads including those through Alton. The Applicant did not indicate that any new roads will be constructed in this application, which the exception of the road realignment.

The Division received comments about coal being blown off the trucks as they travel on public roads. Truck traffic on public roads is regulated by the Department of Transportation. The Department of Transportation is responsible for ensuring that all truckloads are properly covered.

Performance Standards

The Applicant meets the requirements of this section. All roads shall be located, designed, constructed, reconstructed, used, maintained, and reclaimed so as to:

- Control or prevent erosion, siltation, and the air pollution attendant to erosion, including road dust and dust occurring on other exposed surfaces. In Section 534.100-200 and 534-300-340, the Applicant discusses those requirements.
- Control or prevent damage to fish, wildlife, or other habitat and related environmental values. The Division considers that the general requirements are met if the biology requirements have been met.

- Control or prevent additional contributions of suspended solids to streamflow or runoff outside the permit area. The Division considers that those requirements have been met if the hydrology requirements have been met.
- Neither cause nor contribute to, directly or indirectly, the violation of State or Federal water quality standard applicable to receiving waters. The Division considers that those requirements have been met if the hydrology requirements have been met.
- Refrain from seriously altering the normal flow of water in streambeds or drainage channels. The Division considers that those requirements have been met if the hydrology requirements have been met.
- Not locate any road in the channel of an intermittent or perennial stream unless specifically approved by the Division. In Section 534.100-200 and 534-300-340, the Applicant states that roads will not be located in stream channels.
- Prevent or control damage to public or private property, including the prevention or mitigation of adverse effects on lands within the boundaries of units of the National Park System, the National Wildlife Refuge System, the National System of Trails, the National Wilderness Preservation System, the Wild and Scenic Rivers System, including designated study rivers, and National Recreation Areas designated by Act of Congress. The Division considers that those requirements are met if the hydrology and biology requirements have been met.
- Use nonacid- and nontoxic-forming substances in road surfacing. In Section 534.100-200, the Applicant committed to that requirement.
- Maintain all roads to meet the performance standards of this part and any additional criteria specified by the Division. In Section 534.340 and Section 527.230, the Applicant committed to that requirement.
- A road damaged by a catastrophic event, such as a flood or earthquake, shall be repaired as soon as is practicable after the damage has occurred. The Applicant addresses that requirement in Section 527.230.

Primary Road Certification

All drawings provided by the Applicant which are relative to road specifications have been certified by a Utah registered professional engineer.

All primary roads which will be constructed or re-constructed must receive professional engineer certification that they have been constructed according to the approved plans after they have been completed. This requirement is particularly pertinent to the re-construction of Kane County Road #136 (K3900).

Other Transportation Facilities

The applicant has clarified that Lower Robinson Creek will be temporarily diverted in order to maximize the economic recovery of coal from that area, not to facilitate road construction.

Findings:

The information provided in the application meets the requirements of this section.

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

The Applicant met the requirements of this section. The Applicant outlined how they would comply with these regulations in Section 528.330 through Section 528.334.

Coal Mine Waste

The Applicant met the requirements of this section. The Applicant stated in Section 528.320 "Not Applicable". The Applicant does not anticipate that coal mine waste will be produced at the site. Coal mine waste is defined in R645-100 as coal processing waste and underground development waste. The Applicant does not anticipate underground development waste because only surface mining will be done and no coal processing (other than crushing and screening) will occur on the site.

Refuse Piles

The Applicant met the requirements of this section. The Applicant stated in several areas of the PAP, including Section 528.320 that no refuse pile would be needed.

Impounding Structures

The Applicant will not construct impounding structures of coal mine waste.

Chapter 5, pages 5-47 through 5-49 discuss the five sediment impoundments which will control and treat runoff from the disturbed area. A geotechnic analysis of the impounding embankments for these structures is contained in Appendix 5-1. The minimum long term static safety factors for these ponds ranges from 2.2 to 5.3 (minimum requirement 1.3).

R645-301-533.200; Foundation preparation and construction is addressed in section 533.200, page 5-48.

R645-301-533.300; An analysis of the affects of a rapid draw down on the pond embankments is contained in Appendix 5-1. The analysis says that no additional protection measures are needed for the impounding embankments should a naturally occurring rapid drawdown of the pond water volumes occur. The resulting safety factors for the embankments range from 1.2 to 1.9.

Coal Processing Waste Dams and Embankments

The proposed mine plan does not anticipate the construction of any coal processing waste dams and embankments (See Chapter 5, page 5-3.

Burning And Burned Waste Utilization

The Applicant met the requirements of this section. The Applicant will not have coal mine waste at the site. See Section 528.320

Return of Coal Processing Waste to Abandoned Underground Workings

There are no underground workings at the site.

Excess Spoil

The Applicant met the requirements of this section. ACD made the commitment to comply with the detailed inspections standards described for ~~excess~~ spoil in R645-301-514.100 and 514.120. The MRP lists each regulation in R645-301-514.100 through 514.120 to make clear the commitment to meet these inspection standards. In addition, text has also been added to this section clarifying that compaction testing will be performed as part of the inspection process and will be included in the inspection reports.

The Applicant committed to meeting a minimum Proctor standard of 85 % for the fill areas being inspected by the qualified registered professional engineer. A 90 % minimum Proctor is the generally established standard for fill areas. However, if the registered professional engineer conducting the inspections of the replaced fill areas is willing to accept the 85 % Proctor and ensure that the minimum static safety factor requirements for fill areas will be met, the Division will accept an 85 % Proctor standard.

R645-301-514.120 requires that certified copies of each inspection conducted of fill areas be provided to the Division promptly after each inspection.

ACD / LLC has added the recommendations from APPENDIX F, EARTHWORK SPECIFICATIONS to Section 528.310, Chapter 5 of the MRP. Appendix F discusses monitoring of design specifications for the cuts and fills associated with the excess spoil pile construction and the sediment pond embankments to confirm that adequate compaction is being performed during the construction processes. Nine procedure recommendations are listed.

The Applicant described how the excess spoil would be handled in several sections of the PAP, including, 526, 528, 535, and 536.

The pre-topographic maps and the reclamation maps show that the Applicant located the spoil pile in naturally stable areas. Drawing 5-3 and 5-35 show the areas where excess spoil will be placed. Drawings 5-35 and 5-36 show the design of the fill. Appendix 5-1 is a geotechnical analysis of the sediment impoundments and excess spoil structure prepared by Taylor Geo-Engineering, LLC. The Applicant does not plan on disposing of coal mine waste in the excess spoil pile (521.143).

The excess spoil pile is designed to minimize effects on surface and ground water due to leaching and surface water runoff: design details are in Section 535 (745.100). A spring and seep survey identified no springs or wet weather seeps in the proposed excess spoil area. The location for the excess spoil pile encompasses an area of dry meadow west of County Rd. 136 (shown on Plate 3-1). This area is identified potentially sub-irrigated (App. 7-7 (p. 10)). The soil in dry meadow area is map unit 6 (Graystone-Cookcan-Jonale Family complex, 1 – 5% slopes) which is described in Chap. 2, page 13 as medium to coarse textured soil with wet conditions. No underdrains are planned for the excess spoil structure. The final surface of the excess spoil pile will be regraded to a contour that will route water from snowmelt and rainfall around the excess spoil (Drawing 5-35). No manmade water courses are present in the excess spoil area (745.100). Although Appendix 5-1, Slope Stability Analysis for Proposed Excess Spoil Structure and Sediment Impoundments states that the eastern 1/3 of the spoil pile can be constructed up to 90 feet in height and up to 120 feet on the western 2/3 portion with 3H:1V slopes, the actual finished design will only climb to a height of 75 to 86 feet on the east end.

Section 535, p. 5-52 states, “Excess spoil will be placed in designated disposal areas within the permit area in a controlled manner. The fill and appurtenant structures will be designed using current, prudent engineering practices and will meet any design criteria established by the Division”.

The Applicant provides a revised geotechnical analysis for sediment pond embankments and excess spoil pile in Appendix 5-1, based on the revised design of the spoil. “The revised design of the excess spoil and fill above approximate original contour provides concave slopes

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that grade from 5h:1v to 4h:1v to 3h:1v, bottom to top. This change in the slope design has allowed for lowering the compaction specification of the spoil to 85 %.”

Appendix 5-1 states that laboratory testing of the proposed fill materials was completed at 90 percent of the standard Proctor, which confirms that a 90 % Proctor standard can be met. Previously, a standard Proctor of 90 % was required where minimum long-term static safety factors are called for in the Coal Mining Rules. However, the federal regulations were revised to eliminate the minimum 90% requirement for Proctor, as long as professional engineers were willing to certify, in the required constructions inspections, that adequate compaction was being attained to meet the 1.3 or 1.5 static safety requirement.

Large haul trucks (100 to 240 ton) will dump the dirt in place on each lift and a dozer(s) will spread the spoil into four foot lifts. The spreading process will require tracking over the spoil lift repeatedly with the dozer (D10 to D11 size). In addition, most of the spoil lift will also be repeatedly traveled over by the large haul trucks in order to place the material on each lift. The pressure exerted on the four foot lifts from the large mining equipment will provide sufficient compaction to meet the 85% specification. Text in Sections 528.310 and 535.100 has been revised to reflect the revised 85% compaction specification.

Based upon the plan view depicted on Drawing 5-3, it appears that approximately sixty percent of the excess spoil volume will be placed in the coal recovery or “pit” area. Lift thicknesses and grades will be monitored such that they do not exceed the four foot thickness requirement by using GPS technology.

Section 528.310, p. 5-11 describes the method to be used to handle excess spoil generated by the project. Final slopes will be regraded to a maximum slope of 3h:1v. The top of the fill will be sloped to approximately 2 % to prevent pooling of water and to re-establish drainage to original flow patterns. Refer to Drawings 5-3 and 5-35 in the PAP. The spoil will be placed with dump trucks. Then, dozers will be used to spread the material into four foot lifts. The fill will meet at minimum 85% compaction as related to the standard Proctor.

Appendix 5-1, page 8 of 9, section 8.0 Recommendations, of the Taylor Geo-Engineering slope stability analysis for the spoil fills (85% Proctor) and sediment pond embankment stability (90% Proctor), states that an engineer should be present to periodically verify the placement and compaction of fill materials in accordance with Appendix F of the geotechnical report and the State of Utah R645 Coal Mining Rules.

Appendix F contains Recommended Earthwork Specifications authored by Taylor Geo-Tech Engineering. Saturated soils should be placed in areas where they will have little to no effect on the stability of the filled area. Native soils will be ripped to a minimum of twelve inches where they will form the sub-grades for pond embankments.

Findings:

The information provided in the application is considered adequate to meet the requirements for Spoil and Waste Materials.

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:

Commitments in Sections 513.500, 529, 541, 542.700, 551, 731, 738, 748, 755, and 765 to meet the requirements of the Coal Mining Rules for managing Mine Openings, including exploration bore holes, water wells, and monitoring wells.

Sections 513.500, 529, 541.100-400, 542.700, 551, 731, 738, 748, 755, and 765 outline the procedure that will be used for abandonment and closure of wells, including exploration holes and boreholes used for water wells or monitoring wells.

Findings:

Information on Mine Openings meets the requirements of the Coal Mining Rules.

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**

Figure 19 (App. 7-1) illustrates the groundwater recharge areas of Sink Valley. The minesite is divided into two drainages. Runoff from Dry Fork and Lower Robinson Creek drain across the northwest side of the mine permit area, while the south east half is supplied by several sub drainages in the Sink Valley drainage.

Groundwater interception along the eastern edge of the proposed mine permit could have a substantial influence on the function of the ground water system in Sink Valley.

Potentiometric surface levels in Drawing 7-13, the groundwater cross-sections associated with

Figure 6-a in the Peterson Report as well as Figure 16, cross-sections in Figures 6, 7 and 8, the flow pattern in Sink Valley Wash shown in Figure 21, the alluvial groundwater discharge area in Figure 16, and the drawdown and recovery data shown in Figures 17 and 18, all paint a picture of the groundwater resources on and adjacent to the minesite.

The eastern edge of the pits will intercept alluvial aquifers that support numerous springs, wells, and subirrigated lands. Most of the groundwater activity lies east of the fault the lies on the east side for the mine permit area. The fault is not the controlling factor in groundwater movement. It is only linked to groundwater conditions in as much as it offsets the strata some 10 to 30 feet higher on the east than the west. The offset in combination with the regional dip of the strata create the trough of Sink Valley.

There is probably going to be drainage from these alluvial aquifers into the pits, being most probable when the Tropic Shale Ridge is breached during the development and mining of Pits 13, 13, and 15. When mining is done in each pit, it is to be filled and reclaimed. Porous fill material must not be left adjacent to the alluvial aquifers, because that would facilitate continuous drainage from the aquifers into the fill in the pits. A grout curtain or geomembrane would be possible methods of blocking ground-water flow across this boundary, but the Applicant may devise other methods to achieve this purpose. The applicant must provide a design for the margin, where the pits meet the undisturbed alluvium, and specific techniques to be used to minimize drainage from the alluvium into the fill in the reclaimed pits. In the cover letter for the December 2008 submittal, the Applicant states that this has been addressed, but the information could not be found in Chapters 5 or 7.

Groundwater Monitoring

The applicant presents some water quality data collected by Utah International during 1987 and 1988, for their mine application. The applicant began monitoring baseline groundwater conditions in mid to late 2005 and continues today. Data has been sent to the DOGM Water Quality Database. Some of the same data is presented in the Petersen Hydrologic Report in Appendix 7-1. The Division has produced tables from the database, which reflect the accumulation of surface and groundwater data through the first quarter of 2008.

The applicant plans to continue monitoring springs and wells throughout the mining and reclamation operation mining operations. Drawing 7-1 shows locations for seeps and springs.

Section 731.200 provides a groundwater monitoring plan that describes the baseline monitoring activities as shown in Table 7-1. At the end of the hydrology section is a list of baseline monitoring sites for springs, streams, wells and alluvial trenches. Table 7-2 identifies details of monitoring wells, which include the well number, date drilled, screened formation, collar elevation, depth of well, depth of bedrock, and screened interval. Table 7-4 identifies the monitoring protocols for the monitoring sites. Table 7-5 also provides a list of monitoring sites and gives a brief description of their location. Tables 7-7a and 7-7b identify the water quality

parameters the applicant has proposed to monitor for groundwater operational and baseline conditions.

Springs

The applicant has monitored springs for field parameters and water quality. Springs SP-3, SP-4, SP-5, SP-6, SP-8 and SP-33, Johnson Spring, are identified on the baseline monitoring map, Dwg 7-2. The database shows five springs (SP-3, SP-4, SP-6, SP-8 and SP-33, Johnson Spring) were monitored for field parameters and water quality from mid 2005 to the first quarter 2008. Springs SP-3 and SP-4 were not originally proposed as full-suite water quality monitoring sites, p7-45. Several other springs are monitored for discharge and field parameters. Table 7-5 shows SP-3 is to be monitored for quality, but SP-4 is to be monitored only for field parameters.

The text identifies eight springs in the alluvial system that will be monitored for groundwater, (SP-8, SP-14, SP-16, SP-19, SP-20, SP-22, SP-24 and SP-40 (Sorensen Spring). SP-8 will be monitored quarterly for discharge and operational laboratory water quality. Springs SP-14, SP-16, SP-19, SP-20, SP-22, SP-24 and Sorensen Spring will be monitored for discharge and field water quality measurements. SP-15, SP-17, SP-18, SP-21, SP-23, SP-25, SP-26, SP-27, SP-28, SP-29, SP-30, SP-31, SP-34, SP-35, SP-36 and SP-37 are identified as monitoring springs in Table 7-1, but are not shown on Dwg 7-2 or discussed in the text. Spring 23 is listed in Table 7-5 as a monitoring site, where field and quality parameters should be collected. The Applicant should insure all tables and text correlate to each other. The tables at the end of Section 7 are the same as a set of tables in Appendix 7, Petersen Hydrologic, LLC report. The drawings in the Petersen Report show different water monitoring locations than the drawings in the text. The applicant should make sure all groundwater monitoring sites are located on the groundwater monitoring map and their protocols are represented on the map and legend. The text, maps (including legend) and tables, all need to be consistent and correlate with each other, see deficiency written under R645-301-724.100 in the Environmental Resources/Hydrology section of this technical analysis.

Wells

The applicant identifies a monitoring plan for wells in Section 731.200. Wells Y-61, LS-85, SS-30, UR-70 and LR-45 will be monitored quarterly for groundwater operational laboratory water quality parameters, which is Table 7-7A. Wells Y-98, Y-45, Y-102, Y-36, Y-38, C5-130, C2-15, C2-28, C2-40, C3-15, C3-30, C3-40, C4-50, C7-20, C9-25, C9-40, LS-28, LS-60, LS-85, SS-15, SS-30, SS-75 CO-18 and CO-54 will be monitored quarterly for water level. Of these springs Y-98, Y-99, Y-102, Y-36, Y-61, Y-59, Y-45, Y-38 and Y-63 are identified on the monitoring map, Drawing 7-2. Drawing 7-11 shows the typical design of a monitoring well.

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Surface Water Monitoring

Drawing 7-1 shows locations for streams in and adjacent to the proposed permit and adjacent area; Drawing 7-7 shows locations for a number of small ponds created to impound runoff and spring discharge for stockwatering and irrigation, and conveyance ditches. The drawing base for both drawings, the Alton USGS Topographic Quad, shows numerous small ponds that generally coincide with the ponds marked by the Applicant on Drawing 7-7, although the Applicant has identified ponds that are not shown on the basemap. Section 722.200 states there are no significant natural ponds or lakes.

The surface water monitoring plan is summarized in Tables 7-4 through 7-7b.

The Division received a comment that the water monitoring plan was not complete because baseline information was not complete. As has already been discussed, there are some deficiencies in the baseline data that need to be rectified, but on the whole the baseline data provide sufficient understanding of the hydrology of the proposed permit and adjacent area to prepare a surface-water monitoring plan.

Acid- and Toxic-Forming Materials and Underground Development Waste

Appendix 6-2 contains information on the acid- and toxic-forming potential of earth materials naturally present in the proposed permit and adjacent areas. Appendix 6-1 (confidential binder) has information on the Smirl Coal Seam proposed for mining.

The Division received a comment that there were no analyses identifying strata that might contain acid- and toxic forming materials from the Dakota Formation (R645-301-624.220). The data referred to in the preceding paragraph meet this requirement.

Only the alluvial to a maximum depth of 30 feet overburden is being considered for surface placement, according to Section 232.720. Section 728.332 describes the expected selenium hazard. In addition Section 728.332 states that Wyoming has a standard of 0.3 mg/kg selenium as suitable and between 0.3 and 0.8 mg/kg selenium as marginally suitable for topsoil and topsoil substitute. This statement fails to recognize that these concentrations are for upland areas (not agricultural areas) and that post-reclamation monitoring of selenium concentrations are required for such levels of selenium (<http://deq.state.wy.us/lqd/guidelns/guide1.pdf>).

Selenium is associated with sulfide minerals found in sedimentary deposits dominated by shales. Overburden rich in selenium may contaminate surface or groundwater. Selenium rich surface soils may result in toxicity to grazing animals. The Division's Guidelines for Topsoil and Overburden lists the unacceptable levels of selenium in the rooting zone or in ephemeral drainages as greater than or equal to 0.15 mg/kg selenium and as 0.10 mg/kg for the top four feet

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of fill in surface water impoundments and in intermittent/perennial drainages including 100 year flood plains. The guidelines further state that if soluble selenium exceeds these values then placement, assessment, and monitoring will follow the "Joint Selenium Task Force Statement of Best Available Technology, June 1994," which is Attachment 1 of the Guidelines.

Section C Appendix 2-1 and Appendix 6-2 of the application provide surface soil selenium analysis (within the thirty feet of the surface) for soil surface pedons and for the alluvium in six core holes CH-01-05, CH-03-05, CH-05-05, CH-06-05, CH-07 and CH-08. All samples within the surface thirty feet were at or below 0.05 mg/kg water extractable selenium. Since only the upper 30 feet of overburden will be used to construct the reclaimed surface four feet following mining, no selenium impacts to agriculture or to grazing animals are anticipated within the permit area.

Appendix 6-2 also includes results of the analysis of overburden below 30 feet from the same six core holes. The location of the boreholes are shown on the location map at the beginning of Appendix 6-2. The shale overburden had selenium levels less than 0.1 mg/kg using method SW6020 for water soluble selenium. One third of the samples representing the waste rock just above the base coal had elevated selenium content, but were not over the recommended limits described above. Two thirds of the samples taken below the coal seam had unacceptable values of selenium, as reported in mg/kg as follows: 0.15, 0.2. Total selenium values reported for the three Smirl coal seam samples were 0.7, 0.7 and not detected. The weathered coal seam sampled in Robinson Creek was reported to have a total selenium value of 2.2 mg/kg.

The zone immediately below the coal will be exposed through mining and may become saturated as a result of mining. The Applicant's hydrologic reclamation monitoring plan should provide information that is sufficient for the Division to make the required findings of R645-301-880.210 for bond release in accordance with Attachment 1 (p.5) of the DOGM Soil and Overburden Guidelines which states, "If water selenium levels exceed 5.0 ppb, monitoring, mitigation, and possibly bonding for that mitigation will be required."

Section 731 describes the measures to be taken to protect the surface and ground water from wash water, chemicals, fuels, and oils and from sediment load.

Transfer of Wells

The Applicant commits in Sections 738, 748, 755, and 765 that, when no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under the Coal Mining Rules, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with the Coal Mining Rules.

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Discharges Into An Underground Mine

There are no underground mines in the area.

Gravity Discharges From Underground Mines

There are no underground mines in the area.

Water-Quality Standards And Effluent Limitations

The Applicant has committed to apply for a UPDES permit (Section 728.332) to discharge from the mine pit, to either Lower Robinson Creek or Sink Valley Wash, which are both tributary to Kanab Creek. Supplemental containment and sedimentation ponds will be built if needed to meet effluent discharge standards (Section 724.500).

Diversions: General

Drawing 5-3 shows the proposed locations for the sedimentation ponds, ditches, and other sediment control measures. Drawing 5-25 shows the location of. Drawing 5-27 shows the drainages reporting to the sediment control diversion ditches. Details of sediment control diversion ditch construction are on Drawings 5-33 and 5-34.

Diversions: Perennial and Intermittent Streams

There are no perennial or intermittent streams in the proposed permit or adjacent areas. **Diversions: Miscellaneous Flows**

Drawings 5-20 and 5-21 show plans for the Robinson Creek diversion. This is planned to be a temporary diversion. Details of the proposed diversion are given in Chapter 5, Section 527.220

Diversion of miscellaneous flows is planned using four diversion ditches. Two will be primarily used to route runoff from upland, undisturbed areas away from the planned disturbed areas, and the other two are planned to direct runoff from disturbed areas into sediment impoundments. Drawings 5-27, 5-33 and 5-34 show the locations of these diversions, along with the associated watersheds. Appendix 7-2 contains the calculations related to these diversions.

Stream Buffer Zones

The application commits that any perennial or intermittent stream (which includes ephemeral streams that drain a watershed of at least one square mile) in the mine area will be protected by 100-foot stream buffer zones on either side (731.600). Areas surrounding the streams that are not to be disturbed will be designated as buffer zones, and will be marked as specified in R645-301-521.260.

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In order to allow any proposed operations inside a stream buffer zone, the Division will need to make a finding that coal mining and reclamation operations will not cause or contribute to the violation of applicable Utah or federal water standards and will not adversely affect the water quality and quantity or other environmental resources of the stream: the Division has not made such a determination at this time.

Lower Robinson Creek is the only stream in or adjacent to the proposed permit area to which the Buffer Zone rules might apply. As currently proposed, the plan calls for the temporary diversion of a reach of Lower Robinson Creek, approximately 2,000 feet in length, in the SE/4 of Section 19, T. 39 S., R. 5 W. Details of the proposed diversion are given in Chapter 5, Section 527.220 of the MRP.

Other mine disturbances within 100 feet of Lower Robinson Creek include the Loadout Facility, the Main Haul Road where it crosses the creek, Diversion Ditches 2 and 4, and the Excess Spoil Pile (Drawings 5-3, 5-4 and 5-22). No spoil will be placed as valley fill in Lower Robinson Creek (Section 535.200).

Runoff and sediment control measures are detailed in Chapter 5 and Appendix 5-2. Berms or diversion ditches will capture and control runoff from roads and other active mining and reclamation areas and divert the waters to sedimentation ponds. Sedimentation ponds are designed to provide total retention for a 100-year, 24-hour storm event (Section 733.100). In areas where sedimentation ponds or diversions are not suitable, silt fence or straw bales will be utilized to control sediment discharge (Section 731, Groundwater and Surface-Water Protection).

The Applicant has a General UPDES permit that allows discharge of water from the mine; outfalls have not been designated yet, but Lower Robinson Creek and Sink Valley Wash will be the receiving streams (Section 724.200). Discharges complying with this UPDES permit will be in compliance with federal and State water quality standards and should have no adverse affects to the water quality and quantity and other environmental resources of the stream.

There are no proximate downstream uses or water rights. Pre-mining baseline water quality and quantity data are in the Division's database.

The Division finds that the planned coal-mining and reclamation operations within 100 feet of Lower Robinson Creek will not cause or contribute to the violation of applicable Utah or federal water quality standards and will not adversely affect the water quantity and quality or other environmental resources of Lower Robinson Creek. The Division therefore authorizes the Permittee to conduct the planned coal-mining and reclamation activities within 100 feet of Lower Robinson Creek.

Sediment Control Measures

The applicant states that sediment control measures have been designed, constructed and maintained to prevent additional contributions of sediment to stream flow or to runoff outside the permit area (Section 732). The Applicant proposes four diversion ditches and four sediment impoundments for the proposed permit area. Specific areas will be treated by additional miscellaneous controls such as silt fence and berms. The proposed locations for these structures are shown on Drawing 5-3. Details associated with these structures can be viewed on Drawings 5-25 through 5-34 and Appendix 5-2.

The Applicant proposes cut ditches on the shoulders of all primary roads to control drainage and erosion. Cut and fill slopes along the primary roads will be minimal and are not expected to cause significant erosion. In locations where there are culvert crossings (i.e. Lower Robinson Creek), the fill slopes will be stabilized by utilizing standard methods such as grass matting or straw wattles. The location and details for roads can be viewed on Drawings 5-3 and 5-22 through 5-24.

Sediment control measures are to be located, maintained, constructed and reclaimed according to plans and designs given under R645-301-732, R645-301-742 and R645-301-760 in the application. Siltation structures and diversions will be located, maintained, constructed and reclaimed according to plans and designs given under R645-301-732, R645-301-742 and R645-301-763 (Section 731).

Storm water and snow melt within the facilities area is to be routed to a sedimentation pond. This pond is to have a drop-pipe spillway installed to allow removal of oil sheens by using absorbent materials. Drawing 5-28 shows the details for this impoundment (Section 731).

Siltation Structures: General

Siltation Structures: Sedimentation Ponds

Drawing 5-3 shows the planned location of each sedimentation pond. Particulate matter will be allowed to settle prior to the discharging of the water to the receiving water, controlling suspended solids concentrations (728.322). Appendix 5-2 contains sizing calculations for the sedimentation ponds; Appendix 5-3 contains sizing calculations for culverts, and both Appendices 5-2 and 5-3 include sizing data for diversions. Sediment control facilities will be designed and constructed to be geotechnically stable (728.333).

Drawing 5-25 shows the location of sedimentation ponds, and Drawing 5-26 shows the drainages reporting to the sedimentation ponds. Drawings 5-28 to 5-31 show designs for construction of the sedimentation ponds. Drawings 5-32 shows design details for the spillways.

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The planned sedimentation ponds are small enough that they do not need to meet the requirements of MSHA, 30 CFR 77.216(a). The applicant commits that should any impoundments and sedimentation ponds that meet the size or other qualifying criteria of MSHA, 30 CFR 77.216(a) be built, the ponds will meet those criteria.

Siltation Structures: Other Treatment Facilities

No other treatment facilities are planned for the Coal Hollow Mine.

Siltation Structures: Exemptions

No exemptions are requested for the Coal Hollow Mine.

Discharge Structures

Each impoundment will be constructed with a spillway that will function as both the emergency and principle spillway. Each of these spillways will safely discharge a 25-year, 6-hour precipitation event. Impoundments 1 and 2 will be constructed with a drop-pipe spillway system. Impoundments 3 and 4 will be constructed with open channel spillways designed to discharge a 24-hour duration, 100-year storm event. They will be vegetated to minimize erosion. Drawing 5-28 through 5-32 provides the details for these structures.

Impoundments

The Applicant met the following requirements for the sedimentation ponds which are the only planned impoundments:

- The Applicant will not construct any impoundment meeting the MSHA size or other criteria of 30 CFR Sec. 77.216(a) (Section 743.110).
- The Applicant had the designs for the four impoundment certified by a registered professional engineer. See Drawing 5-28 though Drawing 5-32. The Applicant provides slope stability analysis for the four sediment ponds. See Appendix 5-1.
- The Applicant discusses the freeboard designs in Section 743.120 of the PAP.
- The Applicant described the preparation of the impoundments' foundations in Section 533.200 of the PAP.
- The Applicant discussed how the impoundments' slopes would be vegetated and riprapped to protect against erosion.
- The Applicant states in Section 514.300 that a professional engineer or specialist experienced in the construction of impoundments will inspect impoundments during construction, upon completion of construction, and at least yearly until removal of the structure or release of the performance bond; and will provide the Division certified

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reports on the construction and maintenance. A copy of the reports will be retained at or near the mine site.

- The Applicant commits in Section 515.200 that any potential hazards identified by inspections will promptly be reported to DOGM, along with emergency procedures for public protection and remedial action.

The Applicant does not contemplate construction of any permanent water impoundments; coal processing waste banks and coal processing waste dams or embankments (521.125). The Applicant does not contemplate construction of any impoundments meeting the RCS Class B or C criteria for dams in TR-60, or the size or other criteria of 30 CFR Sec. 77.216. 521.125.

Task 2910 deficiency: *"The Applicant must state how the impoundments will be protected from rapid drawdown. Rapid drawdown can occur in earth dams when rapid reductions in the water level produce dangerous changes in pore water pressure. This occurs because the water in the soil tends to flow back into the reservoir through the upstream face. In this scenario, even a period of some weeks may bring about a 'rapid' change in the pore water pressure distribution"*.

The Applicant has submitted a revised Appendix 5-1, Slope Stability Analysis for Proposed Excess Spoil Structure and Sediment Pond Impoundments, prepared by Taylor Geo-Engineering, LLC. The rapid drawdown analysis was performed for ponds #1, #1B, 2, 3, and 4 and the report is contained on pages 6 and 7 of the slope stability analysis.

The rapid drawdown analysis was performed under the assumption that the spillways became plugged, and the basin impounds water to the top of the embankments. Then the water is released or pumped down to the bottom of the basins. The geo-tech analysis utilized soil strengths based on "total stress conditions" as determined from the tri-axial shear tests. The Taylor report #307001 states *"it should be noted that rapid drawdown is highly unlikely since spillway and outlet piping will be no more than four feet below the top of embankments"*. The safety factors reported in the rapid drawdown analysis are considered conservative and range from 1.2 to 1.9. Based on these, no additional protection for the embankments is felt to be necessary.

Ponds, Impoundments, Banks, Dams, and Embankments

Chapter 5, p. 5-47 and Section 743 state that no impoundments meeting the NRCS Class B or C criteria for dams in TR-60, or the size or other criteria of 30 CFR Section 77.216 (a) are planned for the Coal Hollow Mine.

The proposed mine plan anticipates the construction of five sediment control ponds, (ponds #1, 1B, 2, 3 and 4). Designs for these ponds are contained as Figures 12, 12B, 13, 14 and 15. A geotechnical analysis of the embankment stability for the proposed structures is contained in Appendix 5-1. The minimum static safety factor for impounding embankments is 1.3 for a

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normal pool with steady state seepage saturation conditions (R645-301-533.110). All of the proposed pond designs have static safety factors ranging from 2.2 to 5.3.

The certifications, drawings and cross sections can be viewed in Drawings 5-25 through 5-31 and Appendices 5-1 and 5-2. The 3-foot freeboard designed for the impoundments should be sufficient to prevent overtopping from waves and storm events.

Water Replacement

Water replacement is discussed in Section 727. Long-term diminution of flow will be replaced with water from a well that has not been drilled yet. The town of Alton has entered into an agreement to transfer a point of diversion for water rights to 50 acre-feet of water, which the Applicant plans to use to satisfy the water replacement requirements: a copy of the agreement is in Appendix 7-8. The planned new water well will be constructed on lands currently leased by Alton Coal Development, LLC. It is not clear if this will be the water-supply for the mine or for water-replacement only. If the latter, the Applicant needs to commit to have the water-replacement well drilled and developed before beginning overburden removal for Pits 13, 14, and 15.

Findings:

The hydrologic information provided meets the requirements of the Utah Coal Rules except that the Applicant will be required to monitor for selenium where water leaves the minesite, during operational and reclamation phases.

SUPPORT FACILITIES AND UTILITY INSTALLATIONS

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

Analysis:

The Applicant listed the support facilities in Section 526.220.

The Applicant has added minor facilities to Drawings 5-3, 5-4, 5-5,5-6,5-8A, 5-8B, 5-8C.

Drawing 5-3 Facilities and Structure Layout shows the plan view for the surface facilities which includes a shop, offices, coal stockpile area, coal reclaim and loading facilities, etc.

A 750 gallon septic vault is depicted on Drawing 5-6, in conjunction with the 150 foot by 108 foot office building.

Drawing 5-7 shows a 208 foot by 108 foot shop building. This building will house a 750 KVA generator. A 1200 KVA generator is shown on Drawing 5-8B between the coal stockpile and the truck dump hopper. All electrical power for the Mine facilities area is provided by the two diesel generators. Drawing 5-8B, Facilities and Structures / Electrical, shows how sub-surface electrical conduits will be run to provide power from the diesel generators to the various surface facilities. There are no high voltage electrical transmission lines shown on any of the PAP maps.

Drawing 5-8 and 5-8A shows an equipment wash bay with dimensions 50' X 60' X 50' height. The wash bay has a central floor drain which reports to a sump. How the sludge material and water from the sump will be handled must be described in the surface drainage plan.

Drawing 5-8 shows a 28,000 gallon fuel storage facility which contains two 12,000 diesel tanks and a 4000 gasoline storage tank. A 50,000 gallon oil storage containment is also shown.

Aspill prevention and counter measure plan for these bulk storage facilities is found in Appendix 7-5.

Many comments were received concerning dust control and the implications for visibility in the area. Task 2910 deficiency: **R645-301-526.222 and R645-301-423**, *"The Applicant must give a detailed description of the specific dust control structures that will be installed to ensure that fugitive dust is controlled"*.

Drawing 5-8C, **Facilities and Structures, Water Plan** shows an aerial view of the plan to provide water procurement and storage for application on the Coal Hollow mine haul roads. Section 526.220 under **Dust Control Structures** contains a description of the water systems. A solar powered ground water pump will supply volume to two 16,000 gallon portable, steel water tanks. The tank located in the facilities area will provide non-potable volume for the wash bay, and septic facilities at the office building. The tank located along the primary haul road to the mining area will provide volume for the water trucks controlling fugitive dust within the permit area.

Findings:

The Application meets the requirements of the Utah Coal Rules for Support Facilities and Installations.

SIGNS AND MARKERS

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

Analysis:

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The Applicant meet the requirements of this section. The Applicant's commitments to place signs and markers are listed in Section 521.200 through Section 521.270 of the PAP.

Findings:

The information provided in the application is considered adequate to meet the requirements of this section.

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**

The Applicant does not anticipate the need for blasting. Section 523 states that blasting may be implemented after clearing vegetation. Section 524 suggests that a " cursory analysis" indicates blasting may not be necessary for this mining operation due to the soft clay and shale overburden and due to the mining of the coal from on top of the seam to avoid a wet clay layer below. However, submittal of a blasting plan has been provided in accordance with R645-301-524.

Section 627, p, 6-19, Overburden Thickness and Lithology, provides information relative to the types and thicknesses of overburden in the proposed mining area. An alluvial layer ranging from zero to fifty feet in thickness overlies a shale layer which varies from 2 to 200 feet in thickness.

The original mine plan did not include a blasting plan as the Applicant proposed to remove overburden using trucks and front end loaders. This method does not include a means to break overburden, which is the primary function of explosive usage.

The applicant submitted a generic blasting plan in Section 524, Blasting and Explosives, p. 5-22. The blasting plan is contained in Appendix 5-4. The Applicant has committed to providing the Division with a blast design prior to commencement of blasting conditions. The design will be based upon the geologic conditions encountered during the overburden and coal removal process.

Preblasting Survey

All reference to using five pounds of explosive has been removed from the PAP.

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There are two dwellings within one-half mile of any part of the permit area. These are the Swapp and Pugh homes. The Applicant has committed to notifying these families at least 30 days in advance of any surface blasting how to request a pre-blast survey of their dwellings.

The Swapp and Pugh Ranches each contain several other out buildings. Only the homes have foundations, with frame construction. All out buildings are wood frame construction.

General Performance Standards

The Applicant addressed the general performance standards in Section 524 of the PAP.

The Applicant has committed to conducting all surface blasting activities between sunrise and sunset, unless an unscheduled blast is needed (See Chapter 5, page 5-24, section 524.420).. If so, the unscheduled blast will be approved by the Division, based upon a showing by the Applicant that the interests of the public will be protected from noise and other possible adverse impacts.

The Applicant has committed to publishing and distributing a proposed blasting schedule at least 10 days but not more than thirty days prior to the initiation of blasting activities.

Blasting Signs, Warnings, And Access Control

Section 524.500-532, Blasting and Warning Signs, Access Control, is discussed on page 5-25. The Applicant will place blasting signs reading "Blasting Area" within 100 feet of any public right-of-way. All Mine entrances will have signs with explosive usage warning signs, with identification of the various audible warning and all-clear signals. All persons living or working within one-half mile and all personnel working within the Mine permit area will be knowledgeable in the meaning of the audible signals.

Alton Coal Development will control access to blasting areas for the purpose of keeping livestock and un-authorized personnel out of the area until ACD determines that no unusual hazards have been created by the mining sequence.

Control of Adverse Effects

Chapter 5, page 5-26, section 524.600-610, Adverse Effects of Blasting, contains the Applicants commitment to conduct blasting to control air blast, ground vibration and fly rock outside of the permit area. Mining will be conducted so as to prevent changes in the course, channels or availability of surface and ground water outside the Mine permit area.

The maximum legal weight of explosives per borehole when approaching within 1,000 feet of the Swapp ranch (Dames) dwelling must be calculated using a scaled distance factor of 50.

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The maximum legal weight of explosives per borehole when approaching within 1,000 feet of the Sorensen ranch must be calculated using a scaled distance factor of 55.

Records of Blasting Operations

Section 524.700 Records of Blasting Operations lists the requirements for properly documenting all surface blasts to be conducted by Alton Coal Development. The PAP contains the required commitment to maintain all blasting records for a minimum period of three years for Division or public inspection purposes.

Findings:

The information provided in the application meets the requirements of this section.

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:

Map 5-10, Coal Removal Sequence, shows the anticipated dates for when coal would be mined within the permit area.

Drawing 5-2, Disturbance Sequence, shows the areas to be disturbed over four years of coal recovery. The final pit (Year 3) is the area in question relative to the reclamation plan for this site.

The Permittee has provided two options for the reclamation of the final pit area. The first option is to obtain leases outside the proposed permit boundary, and use spoil from the new leases to reclaim the final pit area of the proposed Coal Hollow permit boundary. This is the Applicant's preferred scenario and it is shown on Dwgs. 5-35 and 5-36. Drawing 5-38, Reclamation Sequence, shows that the extreme south and north areas (processing/loading facilities) will be reclaimed in Year 4.

The preferred reclamation scenario (Pits 28-30) is based on ACD being the successful bidder on the adjacent federal leases. Map 1-2, Project Area LBA shows the location of the federal leases that must be acquired through the Lease By Application (LBA) and bidding process.

Based on the assumption that ACD will be the successful bidder on these Federal leases, the addition of those leases would be a significant revision to the Utah coal mining permit .

ACD has mentioned the possible need for a Temporary Cessation status approval by the Division should coal recovery from Pit 30 be completed prior to all permitting approvals being in place for the permit expansion. The Division will process any application made by ACD for a Temporary Cessation status as expeditiously as possible, and will meet the permitting time frame for significant revisions established under R645-300-131.111.1.

If Alton Coal Development cannot obtain the federal leases, then they will proceed with the alternative reclamation scenario.

Mining Facilities Maps

The Applicant did not meet the requirements of this section. The Applicant must label coal stockpile, conveyors and coal load out facilities on Drawing 5-3, R645-301-521.170.

Mine Workings Maps

The Applicant met the requirements of this section. There are no mines in or near of the permit area.

Certification Requirements

The Applicant met the requirements of this section. A registered professional engineer certified all appropriate maps.

Findings:

The information provided is adequate to meet the requirements of the Maps, Plans and Cross-Sections information section.

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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 reclamation plan described in Section 542 is contemporaneous with the operation plan described in Section 528. Overburden removal is shown on Dwg 5-16. Operational sequence and contemporaneous reclamation sequence is shown on Dwg 5-17 through 5-19. The reclamation sequence is shown on Dwg 5-38. Mining pits will be reclaimed within ~~180~~ 60 days of coal removal or 1,500 ft. of active coal face. An excess spoil pile will cover 87 acres at final reclamation and rise 100 ft above the original contour. All reclaimed slopes will be 3h:1v. The surface four feet of all reclaimed surfaces will be replaced topsoil and subsoil. The post mining land use is grazing land or pastureland.

The reclamation techniques and protection measures are described in Chapter 3, Sections 340 through 358.530, pages 44 through 74.

Findings:

Specific findings for reclamation are addressed by discipline below.

POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Analysis:

The post mining land use for the areas to be mined is described in Volume 2, Chapter 4, and Pages 4-6 through 4-9. Assuming the Applicant implements the reclamation plan as described in the MRP the post mining land use should be achieved. There are two landowners of the permit area, Richard Dame and Burton Pugh. The Applicant and DOGM staff have consulted with them regarding their interests in the final outcome of the reclamation efforts. Management plans for each landowner are described on Pages 4-7 and 4-8 of Chapter 4.

The Management Plan for the Richard Dame Property, the current land use of Mr. Dame's property is forage for domestic livestock and some wildlife species. The land includes irrigated pasture for cattle and some horses, native stands of pinyon juniper and sage brush communities as noted on map 3-1, Vegetation. Mr. Dame has expressed an interest to return his property to pasture land that focuses on domestic livestock and includes some plant species for wildlife habitat. Table 3-19 includes the seed mix, native and introduced grasses and forbs, to be planted to meet the landowner's request. A copy of the signed management plan is included in appendices 4-3 and 4-4.

The Management Plan for the Burton Pugh Property, the land owned by Mr. Pugh in the permit area provides forage for livestock and some wildlife species as well. The land includes non irrigated pasture land, meadows, sagebrush/grass, pinyon juniper and oak brush communities as noted on map 3-1. The livestock on the property are mostly cattle and sometimes horses. Mr. Pugh has expressed an interest in restoring his land to its original use or better condition for livestock and wildlife habitat. In order to accomplish this pasture lands will be reclaimed with the focus on domestic livestock. The seed mix will include plant species used by wildlife species in addition to native and introduced grasses. A portion of the property will be reclaimed to sage-grouse habitat as well as mined areas that were interspersed with pinyon juniper. A copy of the signed management plan is included in appendices 4-3 and 4-4.

Appendix 1-7 includes an Amended Grant of Easement and Assignment Agreement for County Road K3900 between Sink Valley Ranch, LLC and Alton Coal Resources, LLC. This document was signed on November 26, 2008 and filed with the County Recorder on December 4, 2008. This document confirms that the landowner is aware of two restoration alignment options on his land and has given the County a 66 ft wide easement under either scenario.

Findings:

The information in the application meets the requirements of this section of the regulations.

PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES

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

Analysis:

The application includes measures to be taken to protect fish wildlife and related environmental values during reclamation operations in chapter 3, Sections 358 through 358.530, pages 72 through 74 including:

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- Threatened and Endangered Species,
- Eagles,
- Removal of a Threatened & Endangered Species,
- Riparian and Wetland Areas,
- Powerline and Transmission Facilities,
- Fences and Conveyers and,
- Toxic-Forming Areas.

Chapter 5, Section 521.125, page 5-8 states that “The MRP does not contemplate construction of any permanent water impoundments; coal processing waste banks and coal processing waste dams or embankments. **Chapter 3, p. 3-80** indicates that there will be no ponds that contain hazardous concentrations of toxic forming materials.

Findings:

The information in the application meets the requirements of this section of the regulations.

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 Applicant states that due to the swell factor excess spoil would be generated and mentions a request for a variance from the approximate original contour requirements in various sections of the PAP including, Section 512.260, Section 553.200, and Section 553.120.

Task #2910 deficiency was written to obtain information about the request for variance, as follows: **R645-301-553.110 and R645-301-553.800**, *“The request for variance from Approximate Original Contour must describe whether the restoration of original drainage patterns can be achieved (R645-301-762.100) or whether the criteria of R645-301-553.800 apply to this surface mine. Excess spoil should be graded to attain the lowest practical grade (R645-301-553.800) and provide a natural appearance to the contours of the spoil pile which would include irregular slopes and irregular surface such that the reclaimed site is compatible with the natural surroundings (R645-301-412.300).*

Alton Coal Development, LLC has responded that the criteria of R645-301-553.800, Backfilling and Grading; Thick Overburden applies to the Coal Hollow surface mine.

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The Alternate Reclamation Scenario (adjacent Federal coal leases not obtained) describes an estimated 1.8 million cubic yards of excess spoil to be generated during the three year life of mine (Section 553, p. 5-65).

The spoil pile covering approximately 85 acres of the disturbed area (435 acres total) will be reclaimed to the requirements of the approved variance from approximate original contour. Section 553.110 explains that *"In areas where excess spoil and variance from approximate original contour occur, the slopes will be re-graded to a maximum angle of 3h:1v and most slopes are flatter (than) as shown on Drawings 5-35 and 5-36."* Appendix 5-1 contains a geo-technical analysis which indicates that the spoil material fills will be stable and meet the minimum long term static safety factor of 1.5. The Applicant has re-designed the proposed excess spoil fills and fill above the approximate original contour to provide a natural appearance. Concave fill slopes will be implemented to minimize erosion. The revised design is shown on Drawings 5-35 and 5-36. The original drainage pattern of Lower Robinson Creek will be restored to a meandering channel.

The mining and reclamation plan will achieve the following backfilling and grading requirements for the excess spoil pile:

- Minimize off-site effects.
- Achieve a final surface configuration that closely resembles the general surface configuration of the land prior to mining. The main concerns are slope length and grade, and whether the drainage patterns tie into the surrounding drainages.
- Provide a subsurface foundation for a vegetative cover capable of stabilizing the surface from erosion.
- Support the approved postmining land use.

Findings:

The information provided in the permit application meets the requirements of this section.

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:**General**

The Applicant has met the following general backfilling requirements:

- Achieve the approximate original contour. The Division considers that the erosion and water pollution will be minimized and that the site will be compatible with the postmining land use if the hydrology, vegetation and land use requirements have been met.
- Eliminate all highwalls: The Applicant states in Section 553.120 of the PAP, that all highwalls will be eliminated. Drawing 5-35, Post Mining Topography – Preferred Scenario and Drawing 3-37, Post Mining Topography – Alternative Scenario, both show that all highwalls will be eliminated at final reclamation.
- Eliminate all spoil piles: The Applicant has requested a variance from AOC under R645-301-553.800 for thick overburden. The Applicant stated in Section 553.120, Section 553.200 and Section 553.210 of the PAP that all spoil will be properly handled. Drawing 5-35, Post Mining Topography – Preferred Scenario and Drawing 3-37, Post Mining Topography – Alternative Scenario, both show a reclaimed spoil pile.
- Eliminate all depressions: The Applicant states in Section 542-100 through 600 that all depressions would be removed except small depression used to retain moisture, minimize erosion, create and enhance wildlife habitat or assist vegetation.
- Achieve a postmining slope that does not exceed either the angle of repose of such lesser slope as is necessary to achieve a minimum long term static safety factor of 1.3 and to prevent slides; minimize erosion and water pollution both on and off the site; and, support the approved postmining land use. In Section 553.130 of the PAP, the Applicant states that the postmining slopes will not exceed the angle of repose and that the slopes will have a long term static safety factor of at least 1.3. Appendix 5-5 provides a stability analysis for the reclaimed areas.

The Applicant has requested a variance from the requirements of R645-301-553 relative to the 60 day limit or 1500 linear feet of distance from the coal recovery area to the backfill area for Pits 24 through 30. With this variance, the Applicant states that impacts to the reclaimed areas on the west edge of the currently proposed permit boundary will be minimized, as excess spoil generated from Pits 24 – 30 can be used to backfill pits created from extraction of coal on Federal lands.

The Permittee has provided two options for the reclamation of the final pit area. The first option is to obtain leases outside the proposed permit boundary, and use spoil from the new leases to reclaim the final pit area of the proposed Coal Hollow permit boundary. This is the Applicant's preferred option and it is shown on Dwgs. 5-35 and 5-36. Drawing 5-38, Reclamation Sequence shows that the extreme south and north areas (processing/loading facilities) will be reclaimed in Year 4.

In order to receive additional time to achieve rough backfilling and grading in Pits 24 through 30, ACD must demonstrate through a detailed analysis that additional time is necessary, in accordance with the requirements of R645-301-553 and R645-301-542.200. ACD's request for an exemption from the requirements of R645-301-553 for Pits 24 through 30 is based upon the following conclusions by the Applicant:

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- 1) A spoil verses pit backfill deficiency exists as a result of the high stripping ratios encountered in Pits 10 through 15.
- 2) The fill above original contour is constructed because overburden from pits that are 150 feet + (Pits 10-15) does not fit into pits that are 70 feet deep or less.
- 3) It takes overburden from several pits that are 80 feet in depth (Pits 16 – 30) to fill one pit that is more than 150 feet in depth.

Appendix 5-5, Stability Evaluation / Analysis for Reclaimed Slopes provides a slope analysis prepared by the mining and geotechnical engineering firm Seegmiller International, under the direction of Dr. Ben L. Seegmiller, a Utah registered professional engineer. Reclaimed slopes will be constructed of the same Tropic Shale material as the excess spoil pile, but the spoil backfill will not be compacted. The proposed design will backfill and grade the reclamation slopes to a 3H:1V slope (vertical angle of 18.4 degree). The highest slope is anticipated to have a 20 foot vertical height. Material characteristics of the Tropic Shales are described on page 2 of the report. Tropic Shale materials “may have friction angles on the order of 24 degrees and cohesions of about 245 PSF”.

Seegmiller International visited the Coal Hollow project area on August 8, 2008 to observe and measure angles of repose in the Mine area. The measured angles were reported to be approximately 33 to 35 degrees. The reclaimed slopes will thus be reclaimed to a vertical angle of 18.4 degrees, which is approximately one-half of the angle of repose of undisturbed native materials (33-35 degrees). The reclaimed slopes are noted as being generally dry, but some ground water could affect material characteristics within the slopes.

The Methodology of Slope Analysis is stated on p. 2 of Appendix 5-5 as follows:

“The stability analysis method that will be employed is based on limiting equilibrium concepts. At limiting equilibrium, the forces tending to create stability are exactly in balance with the forces tending to cause slope failure and, therefore, a safety factor of 1.00 exists. Greater or lesser safety factors allow the relative degree of safety of a slope to be measured.”

Rotational failures were calculated via MCSLOPE, which was developed from PCSTABL5. “MCSLOPE...calculates a deterministic safety factor (SF_d) and uses a Monte Carlo technique to estimate the probabilistic factor of safety (SF_p) and a probability of slope failure (P/F).”

The following safety factors were determined by the Seegmiller analysis:

- 1) Dry Slope.....SF of 2.883 @ 20 foot high slopes at 3H:1V gradient.
- 2) Saturated Slope.....SF of 1.722 @ 20 foot high slopes at 3H:1V gradient.

The proposed fill slope design will be constructed to a 3H:1V gradient (or 18.4 vertical degrees). This vertical angle is approximately one-half of the general area angle of repose which has been determined at 33 to 35 degrees minimum. The planned slope angle is 14 degrees less than the angle of repose of the undisturbed areas.

Initial Box Cut.

Placement of backfill for the initial box cut is discussed in Section 553, p. 5-63. Overburden from Pits 1 - 8 will be removed and stored, then used for the reclamation of those pits. Drawing 5-15 shows three phases of coal recovery. Phase 1 involves mining of Pits 1-8 which have a low stripping ratio (approximately 5 cubic yards of burden : 1 ton coal). Spoil from the first three pits, including Pit 2 (the boxcut) will be placed in an excess spoil area located immediately west of Pit 1 (p. 5-63). When the excess spoil pile reaches 2.7 million loose cubic yards, the overburden from Pits 4- 8 will be used as backfill.

Phase 2 involves the mining of Pits 9-15. The overburden isopach of this area shows that the overburden and stripping ratio significantly increases (Dwg. 5-15). Quoting from the application:

“This increase and the shape of the mining boundary for the Permit Area require a fill above approximate original contour that is an extension of the excess spoil pile. Material from Pits 9-15 significantly exceeds the backfill capacity available from Pits 1-8. The fill above approximate original contour blends in with the excess spoil structure from Phase 1 and extends an additional 2,500 feet to the east.”

A review of Drawing 5-13, Strip Ratio Isopach, indicates that the stripping ratio in the Phase 2 coal recovery area can vary from 5.5 : 1 in the SW corner of the recovery area to as high as 11 : 1 in the NE corner of Pit 15. The Preferred Reclamation Scenario Table (assuming procurement of adjacent federal coal leases) indicates that the Phase 2 coal recovery will generate 5,842,000 excess loose cubic yards of spoil material, with a total of 8,583,000 excess loose cubic yards of spoil for Phases 1 and 2, at 22 % swell factor (p. 5-64).

Phase 3 covers the overburden and coal removal from pits 16 through 30. Stripping ratios vary from 4:1 in the SW corner (Pits 24 –30) to 7:1 in the eastern end of Pit 16. If federal leases are obtained (outside of the currently proposed permit area), overburden from those new mining areas will be used to backfill the pits in Phase 3. This preferred scenario is so named because the Applicant feels the following will occur:

- 1) The preferred scenario for backfilling will minimize overall disturbance.
- 2) Resource recovery will be maximized by providing a transition into the federal reserves with minimal effect to the existing reclamation in the currently proposed permit area.

- 3) Variances from AOC over the Federal reserves will eliminate the need for an excess spoil storage area for a new box cut on the Federal reserves.
- 4) The preferred reclamation scenario provides a method for implementing concurring reclamation by eliminating temporary spoil stockpiles.

Specific Timetable.

A timeframe for completing rough backfilling and grading is provided on p. 5-65 which states the following: "In both scenarios (Preferred and Alternate), rough backfilling and grading operations will follow coal removal by not more than 60 days or 1500 linear feet."

The Applicant has described the backfilling and grading processes to be implemented during the three phases of coal removal in Chapter 5, pages 5-65 and 5-66. The closing statement of Section 553, Chapter 5, page 5-66, states the following; *"As currently planned, the initial mining areas will be backfilled to the planned post mining contour, graded and the topsoil replaced in late Year 1". Spoil from Pit 2 and part of Pit 3 will be permanently placed in the excess spoil area and Pit 1. Part of Pit 3 and all of Pit 4 spoil is placed as backfill in Pit 2, beginning the sequential pit backfilling process. By the time coal recovery is complete in Pit 6, rough backfilling and grading will be complete in Pits 2 and 3."*

A review of Drawing 5-10, Coal Removal Sequence indicates that the Applicant, Alton Coal Development, intends to extract coal from Pits 1-12 during Year 1. As stated above, "the current plan is to initiate backfilling of the initial mining areas...in late Year 1". This current plan does not meet the requirements of R645-301-553, which requires that backfilling and grading must be initiated no more than 60 days after coal recovery is completed, or a maximum of 1500 linear feet from the recovery area.

The current plan shows recovery of coal from Pits 2 through 8 covering a north / south distance of 2200 feet, as well as an additional 750 feet on an east / west direction from Pits 9 – 12 (during Year 1).

Previously Mined Areas

There are no previously mined areas within the permit boundaries.

Backfilling and Grading On Steep Slopes

There are not steep slopes within the permit area.

Special Provisions for Steep Slope Mining

There are no special provisions for steep slope mining.

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Findings:

In both scenarios (Preferred and Alternate), rough backfilling and grading operations will follow coal removal by not more than 60 days or 1500 linear feet. **No variance has been issued from the requirements of R645-301-553. The information provided** meets the minimum regulatory requirements of the R645 Coal Mining Rules.

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:

Commitments in Sections 513.500, 529, 541, 542.700, 551, 731, 738, 748, 755 and 765 meet the requirements of the Coal Mining Rules for Mine Openings, including exploration bore holes, water wells, and monitoring wells.

- Wells constructed for monitoring ground water conditions in the proposed Coal Hollow Mine permit and adjacent area, including exploration holes and boreholes used for water wells or monitoring wells, will be designed to prevent contamination of ground- and surface-water resources and to protect the hydrologic balance.
- All wells will be managed to comply with R645-301-748 and R645-301-765. Water monitoring wells will be managed on a temporary basis according to R645-301-738.
- If any exploration boreholes are to be used as monitoring wells or water wells, these will meet the provisions of R645-301-731.
- Exploration holes and boreholes will be backfilled, plugged, cased, capped, sealed, or otherwise managed to prevent acid or toxic contamination of water resources and to minimize disturbance to the prevailing hydrologic balance. Exploration holes and boreholes will be managed to ensure the safety of people, livestock, fish and wildlife, and machinery.
- A diagram depicting typical monitoring well construction methods is shown in Figure 7-11. A steel surface protector, with a locking cover, will be installed at monitoring wells to prevent access by unauthorized personnel. Where there is potential for damage to monitoring wells, they will be protected through the use of barricades, fences, or other protective devices. These protective devices will be periodically inspected and maintained in good operating conditions. Monitoring wells will be locked in a closed position between uses.
- When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures will be designed to prevent access to the mine workings by

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people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

- Any water well exposed by coal mining and reclamation operations will be permanently closed unless otherwise managed in a manner approved by the Division.
- Wells constructed for monitoring ground-water conditions in the proposed Coal Hollow Mine permit and adjacent area, including exploration holes and boreholes used for water wells or monitoring wells, will be designed to prevent contamination of ground water and surface-water resources and to protect the hydrologic balance. A diagram depicting typical monitoring well construction methods is shown in Figure 7-11.

Sections 513.500, 529, 541.100-400, 542.700, 551, 731, 738, 748, 755, and 765 outline the procedure that will be used for abandonment and closure of wells, including exploration holes and boreholes used for water wells or monitoring wells.

Findings:

Information on Mine Openings meets the requirements of the Coal Mining Rules.

TOPSOIL AND SUBSOIL

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

Analysis:

Redistribution

The Applicant has made several commitments to test topsoil and subsoil materials during removal to ensure that the reclaimed surface provides a suitable rooting medium to a depth of four feet (Section 232.500, App. 2-1 Section 5, p. 5-3; Section 232.700).

The Applicant has stated that 90% of the subsoil used to construct the four foot cover depth will be of good to fair quality with respect to pH and lime characteristics. The applicant further states, "No subsoil or overburden with unacceptable characteristics will be placed within 48 inches of the reclamation surface" (Sec. 5 p. 5-2 App. 2-1). It is understood that the unacceptable characteristics are defined in the DOGM Guidelines for Topsoil and Overburden Handling, as reproduced in Table 4-1, Sec. 4, App. 2-1.

Reclamation slopes will not exceed 3h:1v (Sec. 242.130(c)). Prior to topsoil placement, slopes will be smoothed (Sec. 242.110) and treated if necessary to reduce slippage of redistributed topsoil and subsoil (Sec. 242.200). Rubber tired equipment will be minimized on regarded slopes (Sec. 242.120). Dozers and scrapers will be used to replace the topsoil and subsoil to a depth of four feet that will be comprised of 6 – 12 inches of topsoil and the

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remainder subsoil (Sec. 5 App. 2-1 and Sec. 240). Soil replacement thickness will be checked using a GPS system (Sec. 242.110).

After soil placement, soils will be sampled for fertility and salinity with 1 sample taken per four acres (Sec. Section 231.300 and 243). Areas of compaction due to heavy equipment will be ripped, disked, and harrowed prior to seeding. Areas that are not compacted will be roughened slightly with dozer tracks prior to seeding. Soil amendments will be applied over the seed bed surface. All seed will be applied by drill seeder. Seeding will occur immediately after disking, harrowing or dozer tracking and mainly in the spring or fall. (Sec. 242.120 (b)). Either 1 T/acre straw or ¾ to 1 T/acre wood fiber mulch will be applied to all reclaimed areas after seeding, as described in Section 244.200.

Findings:

The information provided in the application meets the requirements of the R645 Coal Rules for Soils Redistribution Plan.

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

Section 542 lists all roads which will be reclaimed as part of the approved post-mining land use.

The primary haul roads constructed during operations will be reclaimed. Section 542, p. 5-59 contains a narrative of the reclamation procedure for roads which will not be retained as part of the post-mining land use.

In Section 542-100 through 600, the Applicant committed to reclaim all roads according to the requirements of R645-301-542.600.

Retention

Page 5-59 lists three roads to be retained: the County Road 136, the Lower Robinson Creek Road on Pugh property, and the road south to the water well (which will also provide access to the Swapp Ranch). Detailed design change drawings show the Class "B" Kane County road # 136 (See re-submitted Drawing #'s 5-22E, 5-22F, 5-22G, and 5-22H) which is to be re-constructed through the backfilled coal recovery areas of the Coal Hollow Mine. The re-

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construction will occur concurrently with the final reclamation of the south end of the Coal Hollow Mine (currently proposed DOGM permit area / no Federal leases obtained). K3900 (# 136) will be re-constructed on the approximate alignment of the original location of the road. This re-construction will occur during Year 4; this time frame objective is suggested based on the fact that ACD will not apply for a temporary cessation status to permit adjacent Federal leases.

Drawing 5-22H shows detailed road specifications for Option A, as described in the Amended Grant of Easement and Assignment for County Road K3900 (Kane County road # 136).

Drawing 5-22C contains plan, cross section and a longitudinal gradient for K3993. K3993 is the road providing access to the post-mining water well (24 foot width to the east Pugh property junction from K3900 / 12 foot wide road providing the access to the east Pugh property). K3993 will be reconstructed along the alignment which exists at the present time.

The Swapp Ranch access road will be reconstructed having the same specifications as the Water Well Road (K3993) (See Drawing 5-22D).

Drawing 5-35 shows a revised CR 136 alignment around the spoil pile (plan view) on fill above approximate original contour as the Preferred Reclamation scenario. Drawing 5-37 shows the alternate reclamation scenario, with a straight alignment through the reclaim pit area, also on fill, but at the approximate original elevation.

Drawing 5-22E shows a plan view, gradient profile, and cross-section of the re-alignment of County Road 136 (K3900) around the reclaimed spoil pile area (the preferred scenario). The private landowner (C. Burton Pugh) has given Kane County a Grant of Easement (See Appendix 1-7) for this re-alignment. Dwg. 5-22E ties into the plan view and gradient profile of Dwg 5-22F at cross-section 60 + 51.82 feet.

Drawing 5-22F, shows a plan view, gradient profile, and cross-section of the most southern section of County Road 136 (K3900). from cross-sections 61+00 to 92+00, ending at 92 + 85.55 feet. The "typical roadway section(s)" on both 5-22E and 5-22F are identical.

Drawing F-22G is a repetitive drawing which shows the same road cross section and construction specifications as 5-22E and 5-22F.

All road designs are P.E. certified by Utah registered professional engineers.

County Road #136 will be re-constructed within the permit area by the Kane County Road Department. *"The re-construction will occur concurrently with the final stage of reclamation as scheduled on Drawing 5-38 and is expected to be completed by the end of Year 4,"* (Chapter 5, page 5-59). The Applicant has provided details for the reconstruction of County

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Road 136 on Drawing #'s 5-35, 5-37, 5-22E, and 5-22F. However, as can be determined from analysis of Drawings 5-36, and 5-37A, County Road # 136 is to be constructed on top of backfilled Tropic Shale material in varying from 80 feet to 100+ feet in thickness.

The Applicant provided a geotechnical analysis (in accordance with R645-301-527.250) of the subgrade fill of the to be re-constructed Kane County road #136 right-of-way which confirms that construction specifications established by Kane County can be met.

According to Section 627, p. 6-19, Overburden Thickness and Lithology, "*The lower portion of the Tropic Shale overlies the coal seam which is being proposed for mining in thicknesses up to 200 feet. The Tropic shale consists predominantly of soft shales, silty shales and claystones, with occasional thin layers of siltstone and bentonite-like clay layers up to about two feet in thickness.*"

The Permit Applicant provided a letter from a consulting engineer who is experienced in highway construction. Mr. William E. Spitzenberg, a registered professional engineer in the State of Utah, provided the following on March 27, 2009;

- 1) Mr. Spitzenberg reviewed the laboratory analysis of the spoil material tested by Taylor Geo-Engineering (clay material, silty sand, rocks, and shale) and determined that "this mixture of material is suitable as backfill for the private roads (i.e., the Swapp Ranch access road) within the mining area.
- 2) Mr. Spitzenberg also stated the following; "the reconstruction of Kane County road #136 (K3900) will need to meet the following Kane County criteria within the County Road ROW where the mining occurs:
 - a. The backfill material is to be compacted at 8" lifts 8 feet below the roadway cross section to a 95 % maximum dry density as measured by ASTM (D 2922 2937 2167 1556).
 - b. The moisture content during compaction shall be two to five percent above optimum for this fine-grained material.

This will meet the county requirements for a Class "B" subgrade and help minimize settling for the new roadway".

The Applicant has provided adequate engineering support confirming that the backfilled spoil areas within the County Road #136 right-of-way can meet Kane County road department specification for sub-grade.

Findings:

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The information provided in the permit application meets the requirements of this section of the R645 Coal Mining Rules.

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:

Hydrologic Reclamation Plan

The hydrologic monitoring plan is described in Section 731.200 of Chapter 7 (and also Section 12.0 of Appendix 7-1). Hydrologic monitoring protocols, sampling frequencies, and sampling sites are described in Table 7-4. Groundwater and surface-water monitoring locations are listed in Table 7-5. Operational field and laboratory hydrologic monitoring parameters for surface water are listed in Table 7-6, and for groundwater in Table 7-7 of Chapter 7. Hydrologic monitoring during reclamation is assumed to be the same as during mine operation, but this needs to be clarified.

The zone immediately below the coal will be exposed through mining and may become saturated as a result of mining. The Applicant's hydrologic reclamation monitoring plan for surface water should include the dissolved selenium parameter, such that is sufficient for the Division to make the required findings of R645-301-880.210 for bond release. In accordance with Attachment 1 (p.5) of the DOGM Soil and Overburden Guidelines, "If water selenium levels exceed 5.0 ppb, monitoring, mitigation, and possibly bonding for that mitigation will be required."

The Applicant commits in Section 763.100 that siltation structures will be maintained until removal is authorized by the Division and the disturbed area has been stabilized and revegetated. In no case will the structure be removed sooner than two years after the last augmented seeding. All impoundments will be reclaimed at the end of operations. Sedimentation ponds not retained as part of the approved post-mining land use will be removed, the areas regraded, topsoiled, and revegetated (524.100-600). The estimated timeline for removal of impoundments is shown on Drawing 5-38, with expected removal in year four of the reclamation process. In areas where soils require stabilization following the removal of these sediment impoundments, silt fence will be appropriately installed and maintained to provide sediment control until stable conditions are met. When the siltation structure is removed, the land on which the siltation structure was located will be regraded and revegetated in accordance with the reclamation plan (Section 763.200).

Lower Robinson Creek will be reconstructed to its approximate original location. The design for this reconstruction is shown on Drawings 5-20A and 5-21A. This design includes considerable improvements to the channel compared to the channel's current condition, which is such that less than 25% of the channel within the disturbed area has a flood plain present, and most of the slopes are near the angle of repose and have only fair to poor vegetative cover. The reconstructed channel includes stable slope angles that will be revegetated, with a flood plain on both sides of the channel for the entire reconstructed length. The reconstructed channel will be sinuous, and rip-rap will be installed in the bottom of the channel to minimize erosion. The flood plain will be seeded and covered with erosion matting to control erosion until a natural vegetative condition can be attained (Section 742.323).

The Applicant commits in Sections 529 and 765 that, when no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well under R645-301-731.100 through R645-301-731.522 and R645-301-731.800, each well will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division in accordance with R645-301-529.400, R645-301-631.100, and R645-301-748. Permanent closure measures outlined in Sections 542.700 and 551 are designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed, unless otherwise managed in a manner approved by the Division. Permanent closure and abandonment of water wells greater than 30 feet in depth will be in accordance with the requirements of "Administrative Rules for Water Well Drillers" (State of Utah Division of Water Rights) or other applicable state regulations, or by using a different procedure upon approval from the Utah State Engineer (Sections 529 and 765).

The Applicant submits that the geology restricts the flow of groundwater to the west. The same structure that directs and keeps groundwater in the Sink Valley trough limits its flow westward. Wells (piezometers) drilled in the north and western part of the permit area are said to have very little groundwater in the colluvial gravels; whereas, wells and piezometers in the eastern and southern areas show higher potentiometric surfaces. The same is true in Sink Valley lying east of the permit area.

The applicant realizes that there is a good potential of intercepting groundwater as mining moves east. The applicant has discussed mitigation plans in the form of a grout curtain to stem the flow of groundwater to the pit. The applicant states in Section 724.500, if substantial groundwater flows into the mining areas as mining progresses towards alluvial springs and seeps in the eastern part of the permit area (Sink Valley), the conditions will be evaluated at the time they occur.

It appears to the Division that there is a good potential for the mine to intercept groundwater at a high rate as the mine develops east and as the walls of the mine pit are cut into the Sink Valley containment structure, (see Figure 8 A-A', App. 7-1 Petersen Hydrologic report, June 12, 2007 and App. 7-1 Petersen Hydrologic Report, Figure 6a, January 15, 2008). The applicant discusses using ground water resources secured from the town of Alton from water right 85- 744 for in mine use. This information was checked in the Utah Water Rights database. The town of Alton has ground water rights in Sink Valley for agricultural and municipal purposes. Alton Coal Development has purchased the use of 50 acre-feet per year and has an option to purchase more as necessary. The mine can use the water for development or temporary mitigation in the event state appropriated water is intercepted

The Applicant has not provided the basic details of surface contact with the Sink Valley aquifer, specifically the elevations of the mine contact with the alluvium of Sink Valley,

Findings:

The Applicant's hydrologic reclamation monitoring plan (Table 7-6A) for surface water should be modified to include the dissolved selenium parameter, such that is sufficient for the Division to make the required findings of R645-301-880.210 for bond release. In accordance with Attachment 1 (p.5) of the DOGM Soil and Overburden Guidelines, "If water selenium levels exceed 5.0 ppb, monitoring, mitigation, and possibly bonding for that mitigation will be required."

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

Rough backfilling and grading is required for surface mining under R645-301-553. Operational sequence and contemporaneous reclamation sequence is shown on Dwg 5-17 through 5-19. The application describes contemporaneous reclamation of the pits in Section 341.100, and Section 528.200 and Section 542.

Section 341.100 on page 3-44 states that "A detailed schedule and timetable for the completion of each major step in the mine plan has been included in Chapter 5 of the MRP". Chapter 5 includes a detailed description of each step in the surface mining process. Pages 5-59 through 5-65 include some contemporaneous reclamation information. Section 341.100 on page 3-44 states that "*A detailed schedule and timetable for the completion of each major step in the mine plan has been included in Chapter 5 of the MRP*". Chapter 5 includes a detailed description of each step in the surface mining process. The text on page 5-67 and 5-68 indicates

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that “the mined areas will be backfilled and regraded within 60 days of the removal of the coal”. Drawings 5-17,18 and 19 include a detailed description of the phases of backfilling and regrading. Drawings 3-7 and 3-38 include timetables for reclamation.

The applicant requested a variance from reclamation in the 60 day period for the final pit as described in Section 542. This variance has not been granted. See discussion on this issue under R645-301-553, Backfilling and Grading.

Findings:

The information in the application is adequate to meet the requirements for Contemporaneous Reclamation..

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

The revegetation portion of the reclamation plan for the Coal Hollow surface mine is included in Chapter 3, Sections 341 through 358.530, pages 44 through 74.

Revegetation: Timing

Chapter 5 of the application includes a detailed description of the completion of each major step in the mining process. Accordingly, no more than 40 acres will be disturbed at any given time. Section 341.100 on page 3-44 states that “A detailed schedule and timetable for the completion of each major step in the mine plan has been included in Chapter 5 of the MRP”. Chapter 5 includes a detailed description of each step in the surface mining process. As noted in the section under Contemporaneous Reclamation, Chapter 5 includes a detailed description of each step in the surface mining process. The text on page 5-67 and 5-68 indicates that “the mined areas will be backfilled and regraded within 60 days of the removal of the coal”. Drawings 5-17,18 and 19 include a detailed description of the phases of backfilling and regrading. Drawings 3-7 and 3-38 include timetables for reclamation.

Revegetation: Mulching and Other Soil Stabilizing Practices

Mulching techniques are described in Section 341.230, page 3-53 of the application. According to this information mulch will not be applied to the reclaimed pasture land. Granted

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this area is relatively flat and one of the primary uses of mulch is to control erosion. However there are additional beneficial uses for mulch. According to the United States Department of Agriculture research paper, Reclamation on Utah's Emery and Alton coal fields: Techniques and Plant Materials, INT-335, June 1985, page 24, "At the end of the first growing season, frequency of grass plants averaged 92 percent on the ripped area where hay had been rotovated into the soil surface compared to 52 percent on ripped areas receiving no hay amendment." According to the information in the application, subirrigated water for the pastures will be intercepted by the mining operations. The areas themselves will be removed during mining and replaced at reclamation. The source of the water providing flow to these areas will not be impacted as it is located to the east of the proposed disturbance. Accordingly, flow will be restored to these areas once they have been reclaimed.

Revegetation: Standards For Success

Standards for success are described in Section 356, pages 3-62 through 3-65 of the application. They will follow the requirements of R645-301-353 and "Appendix A, Vegetation Information Guidelines". Criteria for determining success include: Cover, Shrub Density, Frequency, Production and Diversity.

Findings:

The information in the application is adequate to meet the requirements for Revegetation.

STABILIZATION OF SURFACE AREAS

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

Analysis:

Stockpiled topsoil and subsoil will be bermed and seeded. These stockpiles cover 17.53 acres (Dwg. 2-2). Seeding of spoil piles is planned for piles that exist longer than a year (Sec. 528.310, p. 5-40.)

Areas adjacent to primary roads will be stabilized and vegetated (Sec. 526.400).

Haul roads will be watered or be treated with dust suppressants and a 15 mph speed limit will be imposed (Sec. 526.400 and App. 4-2).

Slopes of the contemporaneous reclaimed acreage will be less than 3h:1v and will be seeded and mulched after topsoil placement. Lands reclaimed to pasture will not be mulched,

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however (Sec. 244.200). Grass matting may also be used (Sec. 242.130 (c)) and a variety of techniques and materials may be used depending on the reclaimed area (Sec. 244.200).

Construction of the overburden/excess spoil stockpile created from mining Pits 1 – 8 and as mining progresses from Pits 9 – 15 is described in Sec. 528.200. Staged reclamation is shown on Dwg 5-19. Major steps in the backfilling and grading described in Section 553 appeared to be specific to the mined out areas, however, the Applicant states that Section 553 applies to the spoil pile. Section 553 states that the excess spoil pile will be initially constructed in lifts with outslopes at the angle of repose. Rough grading of these outslopes to the final design (as shown on Drawings 5-35 and 5-36) will follow by not more than 60 days of the completed construction of the pile. Section 532.300 states that topsoil will be applied to graded areas within 90 days.

The application specifies that seeding and mulching of the excess spoil pile will be contemporaneous with the staged approach to building the pile. i.e., First the 2.7 million cubic yards from Pits 1 – 8 will be seeded and mulched immediately after regrading and the additional 2,500 feet extension of the excess spoil pile from Pits 9 – 15 will be reclaimed contemporaneously as well. The regrading of the excess spoil to a 3h:1h slope is described in Sec. 528.310. The reclamation timetable provided in Section 540 indicates that regraded areas will be topsoiled as soon as possible and within 90 days of final grading (p. 5-58).

Information provided on the timing of seeding is confusing. The seeding schedule is alternately described as immediately following topsoil application (p. 2-27 and pg 5-57) or as seasonal in nature (p. 5-58) mainly occurring in early spring and late fall (p. 2-27). In the June 16, 2009 submittal, the applicant stated that seeding will be conducted after topsoil application in the appropriate season, following seedbed treatment for compaction or amendment incorporation. The applicant has met the performance standard described in R645-301-354 requires planting during the first favorable planting time generally accepted locally for the type of plant materials selected. The concern is for soil stabilization if there is a long period of time between topsoil application. To protect regraded topsoil (in the event there is a long duration between regrading and seeding) R645-301-244.200 requires that suitable mulch be applied to regraded areas covered by topsoil. However, the mulching sequence described in Section 341.230 indicates mulch will not be applied until after seeding. Adequate soil stabilization between topsoil application and planting might be obtained by tackifier as described in the fugitive dust control plan. However, if this approach does not achieve the required erosion control, then mulching will be required.

The replacement of overburden into the mined out pit will take place within 60 days (Section 553, p. 5-67), although page 5-59 still contains a reference to grading within 180 days which must be corrected to be in compliance with the requirements of R645-301-553. The replacement of topsoil will occur within 90 days of backfilling and grading (p. 5-58).

The replacement of the topsoil will occur within 90 days of backfilling and grading (p. 5-58). Areas observed to be impacted by compaction due to heavy equipment will be ripped,

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disked, and harrowed prior to seeding. Areas that are not compacted will be roughened slightly with dozer tracks prior to seeding (Section 242.120 (b)). The timetable for reclamation provided in Section 542 is specific about the mined out area, but not the spoil pile.

Treatment of rills and gullies is described in Section 244.200 and in Section 244.320 (b).

Findings:

The Mining and Reclamation Plan has met the requirements for soil stabilization, as adequate soil stabilization between topsoil application and delayed planting might be obtained by tackifier as described in the fugitive dust control plan. However, if this approach does not achieve the required erosion control, then mulching will be required. Page 5-59 still contains a reference to grading within 180 days which must be corrected to be in compliance with the requirements of R645-301-553.

CESSATION OF OPERATIONS

Regulatory Reference: 30 CFR Sec. 817.131, 817.132; R645-301-515, -301-541.

Analysis:

The Applicant met the requirements. In Section 515.300 of the PAP, the Applicant commits to follow the notification procedures and otherwise secure the site.

Findings:

Information provided in the application Section 515 mimics the Coal Rules and therefore meets the requirements for Emergency and Temporary Cessation Reporting.

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**

Affected area boundary maps for vegetation and fish and wildlife information are located in Volume 3, Chapter 5, Plates 5-1, 2, 9, 10, 13, 14, and 5.

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Map 1-2, Project Area LBA shows the project area and the proposed expansion for the federal leases. Map 5-10, Coal Removal Sequence, shows only the anticipated dates for when coal would be mined in the permit areas. Coal recovery from expansion areas will be requested within ninety days of final reclamation of Pit 24, see Reclamation Plan/Backfilling and Grading Findings in this Technical Analysis.

Bonded Area Map

The Applicant did not meet the requirements of this section. The Applicant shows on Drawing 5-3 that access to the mine will be from a road branching off from a closed portion of County Road 136. That access road has been included within the permit area.

The following drawings depict the permit area to be bonded prior to receipt of a Utah mining permit:

- 5-1...Pre-Mining Topography
- 5-2...Disturbance Sequence
- 5-9...Coal Extraction Overview
- 5-10...Coal Removal Sequence
- 5-13...Strip Ratio Isopach
- 5-14...Coal Thickness
- 5-15...Overburden Isopach.

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Reclamation Backfilling And Grading Maps

The following drawings depict the areas which are to be reclaimed, following coal recovery:

5-38...Reclamation Sequence

5-35...Post-Mining Preferred Topography

5-36...Post-Mining Preferred Cross Sections

5-37...Post-Mining Alternate Topography

5-37A...Post-Mining Alternate Cross Sections.

The Division previously requested cross sections that show how the site will be reclaimed in the event that the federal leases are not acquired. Alton Coal Development has provided Drawing 5-37A which depicts cross sections of the Alternate Scenario reclamation. Drawing 5-37 depicts the plan view. Both drawings are P.E. certified by Mr. Chris McCourt, Utah registered professional engineer.

The Alternate Scenario is the reclamation plan which will be implemented if ACD does not acquire adjacent federal leases.

ACD has also provided cross-sections and plan view of the "preferred reclamation scenario" (Drawing 5-35 and Drawing 5-36). Both drawings are P.E. certified. Drawing 5-37A shows the cross sections where coal is to be re-covered and the areas where backfilling and grading will occur. Cross sections depict a reclamation plan that will re-establish a smooth contour from high wall crest to high wall crest (See sections A-A', B-B', C-C', D-D' E-E' and F-F'). The applicant has adequately addressed this deficiency.

Reclamation Facilities Maps

Task 2910 deficiency, *"The Applicant must either list in the PAP or show on a reclamation map those facilities that will remain after final reclamation or state specifically in the PAP that all facilities will be removed at final reclamation"*.

The Applicant has provided Drawings 5-35 and 5-37 which depict plan views of both the preferred reclamation scenario and the alternate reclamation scenario. Drawings 5-35 and 5-37 show that all surface facilities relative to coal recovery and loading will be removed, with the exception of the solar powered water well.

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Kane County Roads K3900 and K3993 will be reconstructed as part of the post-mining land use. Drawing 5-22C shows plan, gradient and cross-section drawings for the 12 foot and 24 foot roads which will be retained / re-constructed to the Pugh property.

Drawing 5-22D depicts a plan, gradient and cross-section for the 24 foot road which will be retained / reconstructed to access the water well, which is also to be retained.

Drawing 5-22E shows plan, gradient and cross section for 6,041 feet of County Road #136 (K3900) reclamation.

Drawing 5-22F shows plan, gradient and cross section for 3,234 feet of County Road #136 (K3900) reclamation.

See Findings written under Reclamation/Road Systems and Other Transportation Facilities section of this Technical Analysis for deficiencies with the road reclamation plan.

Final Surface Configuration Maps

R645-301-542.300 Final Surface Configuration Maps are specific to underground mining.

Reclamation Monitoring And Sampling Location Maps

Drawing 3-1 includes the location of the reference areas where vegetation was sampled prior to disturbance. It also includes the monitoring locations for post-disturbance monitoring.

The application states that ground- and surface-water monitoring will continue through the post-mining periods until bond release. The monitoring requirements, including monitoring sites, analytical parameters and the sampling frequency may be modified in the future in consultation with the Division if the data demonstrate that such a modification is warranted (Section 731.200).

Reclamation Surface And Subsurface Manmade Features Maps

Reclamation Treatments Maps

The reviewer is referred to Drawing 5-20 and 5-20A. 5-20 shows the location of the temporary diversion in Robinson Creek and is not a reclamation treatment map. Drawing 5-20A is adequate to show the reclamation treatments for Robinson Creek. The application also includes the reclamation treatment maps, (Drawing 3-7) for the reclaimed areas including a

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delineation of any areas where a different seed mix or rate of application is proposed such as sage grouse habitat and pasture restoration.

Certification Requirements.

The Applicant met the requirements of this section. The Applicant had all pertinent maps and cross-sections certified by a registered professional engineer.

Findings:

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

BONDING AND INSURANCE REQUIREMENTS

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

Analysis:**General**

Alton Coal Development, LLC anticipates disturbing 435 acres (See Drawing 5-2, Disturbance Sequence) to develop this mine, recover the coal, and reclaim the permit area.

Determination of Bond Amount**R645-301-830.140, Detailed Cost Estimates,**

Alton Coal Development, LLC provided detailed cost estimates, with supporting calculations for the following Mine areas on October 14, 2009;

- 1) Demolition of the Facilities and Structures / Loadout as shown on Drawing 5-4.
- 2) Reclamation costs for ponds 2 and 3, including backfilling and grading, re-soiling and re-vegetating.
- 3) Reconstruction of Robinson Creek
- 4) Total Reclamation Costs for Stage 1, to include backfilling and grading, topsoiling and re-vegetation of the 69 acres associated with the mining area.

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- 5) Total Reclamation Costs for Stage 2, to include backfilling and grading, topsoiling and re-vegetation of the 68 acres.
- 6) Total Reclamation Costs for Stage 3, to include backfilling and grading, topsoiling and re-vegetation of the 99 acres.

These total costs must include reclamation costs for the final (or Stage 3 remaining pit) pit area depicted on Drawing 5-19.

- 7) Total Reclamation Costs for the Stage 1 excess spoil reclamation.

As described on Page 13 of the October 15, 2009 submittal, the Phase 1 reclamation cost includes the demolition of the constructed facilities, which must remain through Phase 3, the backfilling and grading of Pits 1 to 6, and re-handling the entire excess spoil pile to backfill pits 7 and 8. The cost figures include sub and top soiling, and re-seeding of the entire area of Pits 1-8. Material handling is accomplished by dozers and truck-shovel combinations. Cost data from CostMines Coal Cost Guide and Mine/Mill Equipment Cost Data were used to develop overall cost estimates. Calculations were performed by Dozsim and Fleet Production/Cost Analysis software packages.

Three reclamation areas are included in Phase 1;

- a) the Mine facilities area
- b) the specialized reclamation areas (Ponds 2, 3, and 4 & Robinson Creek area)
- c) the Mine reclamation area (Pits 1 through 8).

The Division has determined a 2009 bond estimate including direct and indirect costs to be \$ 5,817,858.00. This amount is a 2009 cost only, and this figure must be escalated through the Permit midterm which is 2012.

Phase 2

During Phase 2, Pits 7 through 14 have been backfilled. Once again, dozers and truck / shovel combinations have been utilized to replace the excess spoil, subsoil and topsoil. This cost estimate was determined using the same methods described in Phase 1. During Phase 2, Pit 15 is the last pit in the phase where coal recovery has occurred.

The Division has determined that an additional bond amount of \$ 9,900,000.00 must be posted with the Division prior to the initiation of Phase 2 mining activities.

Phase 3

Drawing 5-19 in the PAP shows the detail at this stage of the Mine development. In this Phase, coal recovery has been completed from Pits 1 – 30. Pits 1 – 23 have been backfilled and graded. The excess spoil pile contains 8.6 million loose cubic yards, of which 6.6 million cubic yards will be used to backfill Pits 24 –30. This statement is based on ACD not being able to obtain additional Federal leases located to the west of the proposed permit area. ACD will use overburden stripped from the newly procured federal leases to backfill pits 24 –30 if those leases are permitted through the regulatory agencies.

Similar to Phases 1 and 2, dozers and truck / shovel combinations will be used to backfill Phase 3.

The Division has determined a reclamation cost estimate for the Phase 3 area of \$ 9,560,000.00.

Form of Bond

To date, (October 19, 2009) Alton Coal Development, LLC, has not posted a reclamation bond with the Division. The Division determined that a bond amount of \$ 6,045,000 must be posted in order to obtain a Permit from the Division and initiate Phase 1 activities.

Terms and Conditions for Liability Insurance

The Applicant met the requirements of this section. Liability insurance form is found in Appendix 1-4.

Findings:

The provided reclamation cost estimates provided by the Permittee for Phases 1, 2, and 3 of the Coal Hollow Mine have been reviewed and are felt to be adequate. The requirements of R645-301-800 have been adequately addressed.

REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

INTRODUCTION

Regulatory Reference: 30 CFR Sec. 785; R645-302, et seq.

Analysis:

The Division has determined that there is no alluvial valley floor in the proposed permit area. There is an adjacent alluvial valley floor west of the permit area on Kanab Creek

Findings:

There is no alluvial valley floor in the proposed permit area or in the adjacent area to the east of the Coal Hollow Mine. There is an alluvial valley floor on Kanab Creek, west of the Coal Hollow Mine.

OPERATIONS IN ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR Sec. 822; R645-302-324.

Analysis:

The applicant addresses the characteristics of an AVF at the confluence of Robinson and Kanab Creeks, but does not specifically classify them as alluvial valley floors. A search of previous review documents indicated an area in Section 25 along Kanab Creek is irrigated from a source of water in Kanab Creek diverted at Section 24. The area is incised and even though it may contain alluvial gravels, the soils are not subirrigated. The field investigation of September 23, 2009 observed the site along Kanab Creek designated a potential AVF. The site is grazed, has alluvial terraces and a stream that was flowing at the time of the field visit. It did not appear there was active farming, but some farming or earth leveling had taken place in the past. The site meets the definition of AVF, because grazing is agricultural and the site is supplied with irrigation water.

An assessment of the site concluded the only impacts could be a change in water quality or changes to the channel in the event large amounts of discharge take place from the mine. The Applicant has supplied plans to monitor water discharged from the mine for flow and water quality, according to the required UPDES permit issued by the Utah Division of Water Quality.

RECLAMATION PLAN

There are areas to the north in the Kanab Creek area that are not currently affected by the Coal Hollow Mine., but may have a potential of being incorporated in future coal mining leases.

Findings:

The applicant has met the requirements of this section with the condition that monitoring be of discharges from the mine be evaluated to determine any impacts to the designated AVF on Kanab Creek. An annual finding shall be placed in the Annual Report during operation and reclamation of any adverse impacts to the channel or diminution of water quality.

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**ALTON/SINK VALLEY
CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT
(CHIA)**

For

**PROPOSED COAL HOLLOW MINE
C/25/0005**

In

KANE COUNTY, UTAH

October 15, 2009

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INTRODUCTION

I. INTRODUCTION

The proposed Coal Hollow Mine and the Alton/Sink Valley Cumulative Impact Area (CIA) are located in Kane County, Utah. The proposed Coal Hollow Mine is located in Township 39 South, Range 5 West, Sections 19, 20, 29, and 30 approximately 2.5 miles southeast of the town of Alton, Utah (Figure 1). Alton Coal Development, LLC (ACD) has applied for a mine permit that will encompass 630 acres leased from private landholders. There has never been any active coal mining in the area. In 1982 and 1987, the area was the subject of a large-scale mine permit application by Utah International Inc. Presently, there are Federal leases surrounding the proposed Coal Hollow Mine permit area to the southwest, west, and northwest that are managed by the Bureau of Land Management (BLM). ACD's objective is to secure some of these leases for future mining activities. Highway 136, which is an unimproved road that is maintained by Kane County, bisects the permit area in Sections 19 and 30. Coal truck traffic will be directed to the north through the town of Alton where it will be transported to a rail line located in Cedar City, Utah.

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.

INTRODUCTION

The objective of a CHIA document is to:

1. Identify the Cumulative Impact Area (CIA) **(Part II)**
2. Describe baseline conditions in the CIA; identify hydrologic systems, resources and uses; and document baseline conditions of surface and ground water quality and quantity **(Part III)**
3. Identify hydrologic concerns **(Part IV)**
4. Identify relevant standards against which predicted impacts can be compared **(Part V)**
5. Estimate probable future impacts of mining activity with respect to the parameters identified in 4 **(Part VI)**
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 Utah regulatory programs established under Utah Code Annotated 40-10-et seq. and the attendant State Program rules under R645-301-729.

HYDROLOGIC CONCERNS

II. CUMULATIVE IMPACT AREA (CIA)

Reviewing Permit Application Packages (PAP) and Mining and Reclamation Plans (MRP) 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 ground-water movement, and surface disturbance and subsidence impact 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. The purpose of delineating the CIA is to prepare a Cumulative Hydrologic Impact Assessment (CHIA) for the entire region that evaluates the hydrologic systems that may be affected by the proposed operation and the magnitude of those effects.

Plate 1 located in Appendix A delineates the CIA for ACD's Coal Hollow Mine permit area in the Alton/Sink Valley region. Two principle drainage basins exist within the region, the Sink Valley Wash watershed and the Upper Kanab Creek watershed. A sub-drainage watershed known as Lower Robinson Creek encompasses the majority of the permit area in Sections 19, 20 and 30. In Kanab Creek, water flows southerly from the headwaters located in Reservoir Canyon east of the town of Alton. Sink Valley Wash is an ephemeral tributary of Kanab Creek whose headwaters originate from the canyons of the Paunsaugunt Plateau located to the east of the valley. Sink Valley Wash Drainage and the Upper Kanab Creek drainage basins are separated by upland cliffs. The two drainages intersect in T40S R6W Section 35. This is the boundary of both the Upper Kanab Creek and Sink Valley Wash Drainage Basins. This area is approximately 6.5 miles downstream of the proposed Coal Hollow Permit area. According the Office of Surface Mining regulations (30 CFR 701.5), the physical extent of possible hydrologic impacts and type of operations located within the applicable river basin must be considered when developing the boundary of the CHIA. The confluence of these drainages represents the most downstream point where any hydrological impacts can be measured. The upgradient portion of the CHIA area is defined by Water Canyon and Swapp Hollow canyons, which are the primary sources of groundwater and surface water to the Sink Valley area and therefore are important factors in evaluating upgradient groundwater and surface water recharge areas to the permit and adjacent areas. The northern section of the CHIA is delineated by the Lower Robinson Creek Subdrainage, which is the watershed that feeds Lower Robinson Creek (in addition to Water Canyon). In addition, all Federal coal leases that surround the proposed Coal Hollow permit area to the north, west, and southwest extend up to the southern boundary of the town of Alton were also evaluated in this CHIA for the purposes of future mining activities that may require procurement of these leases (or a portion thereof).

SCOPE OF MINING

Small-scale coal mining has occurred in the Alton Coal field region from the late 1920s to 1969 where five small mines and two prospects have been worked. Production totals from these mines ranged from 35,000 to 50,000 tons. The last operating coal mine was the Smirl Mine, which was located 1.5 miles south of the town of Alton. The Smirl portal was sealed by the Utah Division of Oil, Gas and Mining in 1992.

The coal seams of economic importance in the region are the Smirl seam with a reported thickness of 14-18 feet and the Bald Knoll coal zone located approximately 200 feet below the Smirl coal seam containing several coal seams separated by thin splits with the thickest seam being 4.8 feet thick. Studies of coal cores performed by Doelling in the 1970s, indicated that the quality of the coal in the Alton Coal field is ranked as sub-bituminous B, with average heating values of about 9,560 Btu's and an average sulfur content of 1.0 percent (Doelling 1972).

The proposed Coal Hollow operation plans to surface mine the Smirl coal seam with an estimated annual production rate of 2,000,000 tons and a daily production rate of 8,300 tons per day. Alton Coal Development, LLC (ACD) is the applicant and intends to operate the mine for approximately 5 years, 6 days per week, 24 hours per year.

III. BASELINE CONDITIONS OF SURFACE AND GROUND-WATER QUALITY AND QUANTITY; HYDROLOGIC SYSTEMS AND USES

BASELINE CONDITIONS

ACD's Coal Hollow Mine permit area within Alton/Sink Valley is located in Kane County, Utah, approximately 2.5 miles southeast of the town of Alton. The bedrock in the area is Cretaceous-age sedimentary rock. The Alton Coal Field is roughly a horseshoe-shaped region that is situated between the Kaiparowits Coal Field to the east, and the Kolob Coal Field to the west. Topographic relief in the area is approximately 2,800 feet. Elevations range from approximately 9,300 feet on top of the Paunsaugunt Plateau, to about 6,500 feet in the valley bottoms. The coal seams of economic viability are situated on the western and southern flanks of the Paunsaugunt Plateau.

An assessment of baseline conditions is needed to determine the land productivity, vegetation and hydrologic conditions that exist prior to mining operations.

Soils

This information was based on data obtained in the Coal Hollow Permit Application, Chapter 2, Volume 1. An Order 2 Soil Survey was prepared for this project by Long Resource Consultants of Morgan Utah January 2008. No published data was available from the National Resource Conservation Service (NRCS). A soil survey map showing the location of the principal soil units is included as Drawing 2-1 in the Coal Hollow MRP.

Field studies for an Order 2 soil survey were completed in 2007 for the Coal Hollow Project. The survey was conducted on private lands leased by by ACD and adjacent lands. The soil survey's objective was to 1) identify suitable sources of subsoil and topsoil; 2) determine topsoil and subsoil salvage depths and quantities; and 3) develop a post mining reclamation plan using salvaged soil materials. The soil survey encompasses approximately 630 acres. It should also be noted that the Natural Resources Conservation Service (NRCS) is presently actively involved in collecting soil data from the Alton/Sink Valley area for the purposes of publishing a soil survey. Currently, there is limited NRCS data available for the area, in draft format.

A Family - Wapiti Family Complex 3 to 8 percent slopes

Clayey soils dominate the north central portions of the Coal Hollow Mine permit area just west of the Tropic Shale ridge. This unit is characterized with very slow hydraulic conductivity rates of less than 0.04 inches per hour. Sagebrush and grasses dominate on this soil unit. This

unit will underlie the first phase of surface facilities and establish topsoil and subsoil stockpiles built on the site.

M Family - Calendar Family D Family complex 3 to 8 percent slopes

This unit occurs at the north end of the permit area where surface facilities are to be built. Soils from this unit contain Tropic Shale parent material at 20-72 inches below the surface. This unit is also dominated by clayey soils with very slow hydraulic conductivity rates of less than 0.04 inches per hour. Vegetation on this unit is dominated by sagebrush and grasses with some pinion pine and Utah juniper.

Cibeque Family - Wapiti Family complex, 3 to 8 percent slopes

This unit is comprised of deposits of very deep soils from both the alluvial fan deposition and organic matter from Robinson Creek. The soil is a sandy loam found along the banks of Lower Robinson Creek on the western portion of the permit area.

Jonale Family – Graystone Cobbly Substratum Family – Wapiti Family complex, 3 to 8 percent slopes

This unit is characterized by very deep fine-loamy and course-loamy soils with mollic epipedons and calcic horizons. Lime accumulations below 12-22 inches are common. PH is strongly alkaline below 22 inches. Vegetation in this unit supports big sagebrush and grasses. This soil is primarily situated on the west side of Highway 136 with some areas located on the central and the east side of the permit area directly on the alluvial fan complex.

Calendar Family – M Family – Driffty Family complex, 8 to 25 percent slopes

This unit is characterized by moderately deep (20 to 40) inches to shallow Tropic shale. The moderately deep soils have clayey texture while the shallow soils are loamy. Vegetation in this unit supports Pinyon pine, Utah juniper, black sage and grasses. This unit is represented in the most northern and western extremes of the permit area.

Graystone - Cookcan – Jonale Family complex – 1 to 5 percent slopes

Soils within this unit have medium to course textures and are very deep. This unit is not considered good subsoil. This unit is found on the western side of the permit area. Vegetation in this unit supports grasses, sedges, and forbs.

Happyhollow Family – Alamosa complex, 1 to 5 percent slopes

This unit is located on the Tropic shale ridge on the east side of the Sink Valley fault.

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Soils are characterized by clay and high water table that is perched on the heavy clay soils. Groundwater is within a foot of the surface during wet periods. This unit supports vegetation comprised of sedges and forbs.

Brumley – Graystone Cobbly - Snilloc complex, 3 to 8 percent slopes

These soils are medium to coarse textured developed in very deep alluvium on the east side of the permit area. Evidence of a fluctuating water table was noted at depths between 48 to 60 inches.

D Family – Deacon complex, 5 to 30 percent slopes

This unit is characterized by clayey soils very deep with dark surfaces. Lime content increases between 6 to 12 inches below the surface. Soils appear to have derived from the large alluvial fan deposits. This unit runs parallel to the majority of Lower Robinson Creek. This unit supports big sagebrush, rabbitbrush and grasses with Pinyon pine and Utah juniper.

Zigzag Clay – 8 to 25 percent slopes

This unit is comprised of clayey soils derived from the shallow Tropic Shale ridge area that formed along the Sink Valley escarpment. The vegetation supported by this unit includes: Pinyon pine, Utah juniper, black sage and Indian ricegrass.

A Family Clay– 8 to 25 percent slopes

These soils are situated on the footslope and backslope of the Sink Valley fault escarpment. These deep clays support grasses, rabbitbrush, and big sagebrush.

Manzanst Taxadjunct Family clay – 3 to 12 percent slopes

This unit consists of clayey soils deep to very deep to Tropic Shale formed on gentle to moderately steep slopes along the southwest side of the permit area. This unit supports vegetation consisting of Pinyon pine, Utah juniper, black sage, and Indian ricegrass.

A Family – Happyhollow Family complex – 1 to 5 percent slopes

This unit consists of clayey soils very deep to Tropic Shale and formed on nearly level to gently sloping slopes in the south central portion of Sink Valley. Vegetation is grasses.

Vegetation

Vegetation within the Coal Hollow Mine permit area consists of pinyon and juniper in the most extreme northern, western and southern sections. Sagebrush, rabbitbrush and grasses are observed on the flatter valley areas within the permit area. Most of the permit area that follows the county road on the eastern side is considered pastureland with punctuated localized areas of sagebrush and pinyon/juniper trees. Vegetation in the adjacent areas is fairly representative of what is found in the permit area. Pinyon and Juniper trees dominate the higher elevations on the Paunsaugunt Plateau and within some upland areas to the west of the permit area. The permit and adjacent area is mapped as habitat for the Greater Sage Grouse species (*Centrocercus urophasianus*). The Greater Sage Grouse utilizes open sagegrass/grassland areas as breeding grounds during their mating season (also known as "leks"). One lek exists in the Alton area and is approx. 100 yards west from the Swapp Ranch House (within an enclosed in a barb-wire fenced pasture). A roosting area is also present 0.25 miles northeast of the lek. Chapter 3 within the MRP addresses a habitat management plan for the Greater Sage Grouse.

Generalized Geology

Stratigraphic units present in the Alton Coal Field and relevant to the Coal Hollow permit area are comprised of Cretaceous-age units in the southern and south-central portion of Utah. Economic coal reserves exist within the Dakota Formation. All the stratigraphic units exposed in the Alton Coal Fields are listed in ascending order below:

Navajo Sandstone (Lower Jurassic)

The Navajo Sandstone is a light gray to tan, massive eolian sandstone deposit that underlies the entire region. Very prominent features of cross-bedding characterize this rock unit, making it a very recognizable formation. Thickness of the Navajo Sandstone in the Paunsaugunt Plateau regions exceeds 1,000 feet. The Navajo Sandstone is the principal deep aquifer in this region and provides high-quality groundwater to agriculture, municipal and domestic wells in the area. The Navajo Sandstone is located beneath 1,000 feet of overlying bedrock and will not be impacted from the proposed mining activities.

Carmel Formation (Upper Jurassic)

The Carmel Formation unconformably overlies the Navajo Sandstone in the region. The Carmel Formation is heterogeneous and consists of several member units comprised of limestone, siltstone, sandstone and gypsum beds. The thickness of the Carmel formation ranges from 650 to 800 feet in the Alton Coal Field area. The Windsor member of the Carmel Formation outcrops about one mile south of the Coal Hollow permit area.

HYDROLOGIC CONCERNS

Entrada Sandstone (Upper Jurassic)

The Entrada is a massive, fine-grained, cross-bedded sandstone in the region. The formation does not outcrop in the area of the proposed Coal Hollow permit site.

Dakota Formation (Cretaceous)

The Dakota Formation is a fine to medium-grained sandstone interbedded with shale and coal. The economically viable coal seams in the Alton Coal Field are within this rock unit. In the permit area, the Dakota Formation directly overlies the Carmel Formation.

Tropic Shale (Cretaceous)

The Tropic Shale consists of gray and carbonaceous silty shale and claystone with few marine sandstone beds located mostly in the upper part. The formation typically erodes to a clayey soil that forms gentle, vegetated slopes. The Tropic Shale is found within the Coal Hollow mine permit area. The regional thickness in this area is approximately 700 feet. In the areas planned for mining, approximately 200-250 feet are present.

Straight Cliffs Formation (Cretaceous)

The Straight Cliffs formation is predominately calcite-cemented sandstone and mudstone. The sandstones of the Straight Cliffs Formation make up the lower two-thirds of the ledges radiating out from the southern Paunsaugunt Plateau. The Straight Cliffs Formation outcrops on the hillsides east and north of the Coal Hollow Mine permit area.

Quaternary Alluvium

The alluvium deposits in the area consist of poorly sorted alluvial and colluvial silt, clay, sand, and gravel. These deposits consist of stream and fan alluvium and terrace deposits. In downstream areas, the alluvial material consists primarily of mud derived from Tropic Shale. In Sink Valley and Lower Robinson Creek drainages near the Coal Hollow permit area, drill cores indicate that alluvial thicknesses in some locations range from a thin veneer overlying bedrock to at least 140 feet in thickness along eastern margins of sink valley. Much of the land surface in the Coal Hollow Mine permit area consists of fan alluvium deposited from sheet floods, debris flows and mud flows.

HYDROLOGIC CONCERNS

System	Series	Stratigraphic Unit		Thickness (Feet)	Description
Tertiary	Eocene	Claron Formation		1000-1300	Pink, white, and varicolored limestone, cliff former eroding into picturesque slopes and forms, basal conglomerate of exotic quartzite and limestone cobbles and pebbles. — Unconformity —
	Campanian	Kaiparowits Formation		265-700	Dark gray to gray-green arkosic sandstone, friable with weak calcareous cementation. — Unconformity —
Cretaceous	Santonian ? Comiacian ? Turonian	Wahweap Formation <i>Minor Coal</i>		500-1300	Alternating sandy shale and thin- to thick-bedded resistant sandstone, ledge and slope topography.
		Straight Cliffs Formation <i>Minor Coal</i>		80-500	Yellow-gray to brown, thick-bedded to massive cliff-forming sandstone with subordinate intervening gray shale, shaley sandstone, coal and carbonaceous shale.
		Tropic Shale		700-1000	Drab gray shale with subordinate thin brown fine-grained sandstone, slope former.
		Dakota Formation <i>Major Coal Seams</i>		150-450	Yellow-gray to brown fine- to medium-grained sandstone alternating with gray shale, sandy shale, carbonaceous shale and coal, ledge and slope former creating Gray Cliffs; best coal near bottom and top of unit. — Angular Unconformity —
	Cenomanian				
Jurassic	Upper	Entrada Sandstone	Cannonville Member	0-300	White and reddish banded fine-grained sandstone and siltstone, friable and earthy weathering, massive.
			Gunsight Butte Member	0-300	Red-brown and light green siltstone; also red cross-bedded sandstone of the "slickrock" type.
		Carmel Formation Judd Hollow Tongue of Carmel	Wiggler Wash Member	0-60	Limestone, red siltstone, white and greenish gypsum.
			Winsor Member	180-250	White, pink, brown sandstone alternating with thin red siltstone and mudstone.
			Paria River Member	55-200	Interbedded light gray and red sandstone, limestone, siltstone, shale, and gypsum.
			Thousand Pockets Tongue of Navajo Sandstone	0-60	Yellowish cross-bedded friable but resistant sandstone.
			Crystal Peak Member	120-190	Dark reddish brown and white to light gray fine-grained sandstone, medium-bedded with minor thin gypsiferous or calcareous shales and conglomerate.
			Kolob Limestone	122-350	Gray and tan dense limestone with some thin sandy red shale near the base and thin gypsum near top. — Unconformity —
	Lower	Navajo Sandstone		1000+	Light gray to tan, locally red fine-grained sandstone, massive, exhibiting large-scale aeolian cross-bedding, calcareous and cliff forming.

Figure 1. Generalized Geologic Section of Rock Formations in the Alton Coal Field (from Doelling, 1972).

HYDROLOGIC CONCERNS

Coal Seam Geology

The principal coal-bearing seam within the permit area is contained within the Dakota Formation. Coal seams are also located in the Smoky Hollow Member of the Straight Cliffs Formation but this seam is only a few inches in thickness and not of economic importance. Two regionally important coal zones are present within the Dakota Formation: the Smirl coal zone, which is planned for mining by Alton Coal Development and the Bald Knoll coal zone, located about 200 feet below the Smirl zone at the base of the Dakota Formation. The Smirl coal zone is reported to be 14 to 18 feet thick while the Bald Knoll coal zone contains several coal seams with the thickest being 4.8 feet thick.

Structure

High plateaus characterize topography in the Alton/Sink Valley CIA. The Alton Coal Field is within a horseshoe-shaped structure with the Kaiparowits Plateau comprising the eastern flank and the Kolob Coal Field comprising the western flank. Rocks within the region have undergone little structural deformation; however, rocks in the western portion of this region have been subjected to several faulting episodes that have produced north/northwest trending faults. The Alton Coal field is bounded by the Paunsaugunt Fault to the east and the Sevier Fault to the west. The displacements of these faults are about 1,000-2,000 feet and 100 to 800 feet, respectively. The Sink Valley Fault that bisects the permit area is a fault with minor offsets of up to a few tens of feet. Bedrock formations in the permit area dip gently to the east/northeast while the surface topography slopes gently opposite to the west/southwest.

Climate

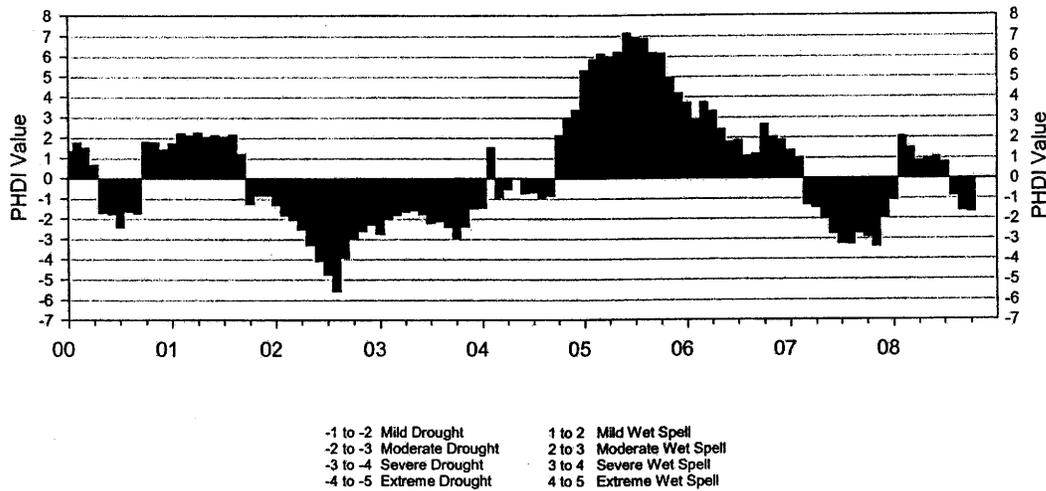
Climate in the Alton/Sink Valley area ranges from arid in the lowest elevations to sub humid atop the highest plateaus. Normal annual precipitation ranges from 6 inches in the lower elevations to 40 inches in the upper elevations. Winter snow accumulations can occur up to 10 feet in the high altitudes. Summer precipitation exists mainly as localized thunderstorms that can produce up to one inch of rain in less than an hour. Evaporation in the region is a dominant factor with annual rates of evaporation exceeding the annual rates of precipitation. Average annual pan-evaporation rates range from about 75-85 inches (UDNR, 1981). Large evaporation rates significantly decrease the quantity of water that would otherwise runoff in streams or would recharge the groundwater system. Temperature and precipitation data have been routinely measured and recorded at the Alton, Utah weather station since 1928. Data from the weather station indicates that average annual precipitation is 16.38 inches per year.

Since the 1980s, the region has experienced cyclical periods of wetness and drought conditions. The Palmer Hydrologic Drought Index depicts long-term climate trends by illustrating monthly values of drought or wetness by assigning a value to indicate severity. For

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example, to show a scale of mild to extreme drought negative values ranging from -1 to -5 are assigned -5 being extreme drought. Conversely, wet conditions are shown on a positive scale from 1 – 5 with 5 being an extreme wet spell. Since September of 2008, the region has been in a normal period (with values between -2 and 2) meaning neither wet nor drought. As a result, baseline hydrologic monitoring of the permit and adjacent area since September 2008 has occurred under normal climate conditions.

Figure 2 - PHDI, Utah Region 4



The Alton/Sink Valley CIA is located within Palmer Hydrologic Drought Index (PHDI) Regions 4 (Figure 2) and shows the PHDI for 2000 through 2009. Over the past decade, the area has seen cycles of both extreme droughts to extreme wet spells.

Ground-water regimes in the CIA are dependent upon climatic and geologic parameters that establish systems of recharge, movement, and discharge. In the Alton/Sink Valley CIA, precipitation and snowmelt at higher elevations provides most of the water for ground-water recharge (USGS, Plantz, 1985). Recharge has been estimated to be 4 percent (Price and Arnow, 1974) of the average annual precipitation for areas in the Kolob, Alton and Kaiparowits coal fields. Well-developed soils and permeable or fractured lithologies exposed at the surface facilitate recharge.

Probable Alluvial Valley Floor Areas

The Office of Surface Mining (OSM) has published study guidelines on what criteria to look for when making a determination for an Alluvial Valley Floor (AVF). The definition is presented in Section 701 of the Surface Mine Control and Reclamation Act and the Utah Coal Rules R645-100-200, and the State rules regarding AVFs are in R645.302.321 through 323. The

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provisions in the rules state that (1) certain types of stream valleys in the Western United States are prohibited from disturbance by coal mining activities and (2) some other types of stream valleys in the West may be allowed to be mined but must meet higher reclamation standards than other types of mined lands. Both of these descriptions of stream valleys fall into the category of alluvial valley floors.

The Division performed an evaluation of the Coal Hollow permit and adjacent area as part of the permit application review process for the presence of an alluvial valley floor within Sink Valley.

The review was performed based on the following definition OSM that provides for meeting the following criteria to determine the presence of an alluvial valley floor for areas in the western United States:

1. are located in topographic valleys having an associated stream channel,
2. underlain by unconsolidated deposits whose surface usually has the landform appearance of flood plains or terraces, and
3. have an agricultural importance derived from the availability of surface or groundwater.

The ultimate goal is to prevent surface disturbance to areas that have agricultural importance or to determine that regional water availability is not affected.

The Division published a Technical Analysis document in March 2009 concluding that Upper Sink Valley, where the mine is proposed, consists of high terrain alluvial fan deposits, with no flood plain or terrace complexes. The Division acknowledged that although some of the criteria for an AVF are present within Sink Valley, not all the characteristics listed in the definition were clearly present (i.e. stream-laid deposits holding streams with water availability sufficient for irrigation or subirrigation activities”.

The investigation then focused on a reconnaissance for alluvial valley floors in the adjacent areas of the Coal Hollow Permit area in order to determine possible hydrologic consequences to these adjacent areas from mining. Based on an investigation by Petersen, two locations were identified as probable alluvial valley floors: a valley in the Kanab Creek drainage located in Sections 25 and 35 of T. 39 S., R. 6 W., and the lower portion of Sink Valley located in Section 6 of T. 40 S., R.5 W.

The Division conducted field reconnaissance in September 2009 to evaluate these areas, the valley within the Kanab Creek drainage was observed to have a continuous stream channel, geomorphic terraces, and improved rangeland where cattle was grazing. The area appeared to be subirrigated. Subirrigation is defined by the alluvial valley floor regulations as “the supply of water to plants from underneath or from a semi-saturated or saturated zone where water is available for use by vegetation” (30 CFR 701.5). This area was determined to have

characteristics of an alluvial valley floor. According to the Petersen report, crop production in this area is limited to hay.

The second area evaluated with the Lower Sink Valley Wash. The stream channel in this area was deeply incised and other characteristics such as improved rangeland and geomorphic terraces were present. This area did not appear to be able to support irrigation or show any indications of subirrigation based on the vegetation observed. Vegetation consisted of sagebrush and some grass areas. There is no residential development or active water rights in this area. Based on these observances, the Division concluded that this area does not have the characteristics of an AVF. Plates 1 through 3 in Appendix A show the boundary of the probable AVF area in Sections 25 and 35, T. 40 S., R. 6 W.

Properties of Water-bearing Stratigraphic Units in the Permit Area

Regional aquifer

The aquifer of regional significance is the Navajo Sandstone formation. The Navajo Sandstone is a resource for domestic, municipal and agricultural groundwater. The Navajo Sandstone is isolated by approximately 1,000 feet of overlying strata in the permit area and consequently, will not be impacted by proposed mining activities. As a result, the Navajo Sandstone will not be considered a factor in evaluating aquifers that are pertinent to this CHIA. In preparing this CHIA, the Division has adhered to the definition of *aquifer* as found in the Coal Mining Rules (R645-100-200), and the term regional aquifer has been deliberately used or avoided, as appropriate, throughout this CHIA. Although there are local alluvial, perched, and fracture-related aquifers at Alton/Sink Valley, the quality, quantity, use, storage, flow and transport, and discharge of ground water do not indicate the presence of a regional aquifer or aquifer system.

Three principal stratigraphic units are found in the permit and surrounding areas that are considered part of this CHIA evaluation are the Dakota Formation, the Tropic Shale and Quaternary-age alluvium. The characteristics of each unit are described below:

Dakota Formation

The Dakota Formation is a shaley strata interbedded with fine to medium-grained sandstone and coal. The Smirl coal seam is contained within the Dakota Formation. In a report prepared by Petersen Hydrologic, LLC investigating the groundwater and surface water systems in the permit and adjacent area, Peterson suggests that recharge to the Dakota Formation by the overlying Tropic Shale is negligible due to the poor groundwater transmitting properties of the Tropic Shale. Petersen goes on to suggest that since the unit contains several vertically and horizontally discontinuous sandstone horizons, this impedes the flow of groundwater considerably. Only minor seeps with negligible discharge rates were found to originate in the

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Dakota Formation in and adjacent to the Coal Hollow Mine permit area.

Tropic Shale

The Tropic Shale outcrops as an observable ridge in the east-central portion of the permit area, which is likely a feature formed by the presence of the Sink Valley Fault. Other outcroppings of Tropic Shale are located in the most extreme southwest corner and also as two small knobs on the western side of the permit area. The lithologic characteristics of this unit are primarily uniform shale to silty shale with high clay content. No significant springs or seeps were identified as originating from this unit with the exception of one seep that discharges at a rate of less than 0.5 gallons per minute. The Tropic Shale is a poor transmitter of water and forms a basal confining layer for the overlying alluvial groundwater system. No appreciable amounts of groundwater flow from the Tropic Shale were observed during drilling activities for the baseline monitoring program.

The expression of the Tropic Shale ridge that exists in the northeast section of the permit area is believed to create a hydrologic barrier to the alluvial groundwater system that overlies the Tropic Shale. As a result of this geomorphic barrier, alluvial groundwater is directed to the south. Once mining commences and the Tropic Shale ridge is excavated to accommodate mining pits, there is the potential that alluvial groundwater will flow in a more westerly direction since there will be no barrier to impede its flow. Appendix 7-9 in the Coal Hollow Mine MRP is a Contingency Plan for minimizing or eliminating flows that might occur when this shale ridge is breached.

Alluvial Groundwater

The principal water-bearing stratum in the permit and adjacent area is the alluvial sediments. Alluvial discharge to the surface occurs as both springs and seeps. The greatest concentration of alluvial groundwater discharge is found in the central Sink Valley area. This area was found to have the thickest section of alluvial sediments in Sink Valley where groundwater exists under artesian conditions. The groundwater source for recharge of the alluvium is considered to be the upland areas of the Paunsaugunt Plateau.

In January 2007, Petersen Hydrologic conducted a 28-hour pump and recovery test on monitoring well Y-61, which is located in the coarse alluvium at the base of Swapp Hollow Canyon, adjacent to the eastern boundary of the permit area. The objective of the pump test was to 1) evaluate hydraulic communication between the coarse alluvium of the pumping well Y-61 and the silty, clayey, and sandy alluvial sediments overlying areas planned for mining at the Coal Hollow Mine, and 2) to evaluate the aquifer characteristics of the coarse-grained, artesian portion of the Sink Valley Wash alluvial groundwater system. During the pump test, discharge was measured at four nearby springs and water levels measured in 20 observation wells. Information is in Section 9.3 of Appendix 7-1 of the Coal Hollow Mine MRP. Drawdown in the wells

nearest Y-61 within the test period was up to 25 feet; the response to the pump test in other monitoring wells was negligible, with drawdowns of less than one foot. Drawing 7-14 in Chapter 7 illustrates the drawdown at C2-40, Y-102, and Y-59, three observation wells within 1,000 feet of Y-61; Figure 18 of Appendix 7-1 shows the smaller drawdown response at C2, C3, C4, and SS, observation wells along the eastern margin of the proposed mine; and contour lines on Figure 17 of Appendix 7-7 show the extent of the measurable drawdown in the observation wells. The results of the test indicated good groundwater communication between the pumping well and wells and springs within 1,400 feet of the pumping well. Observations at the springs and wells indicated that recovery continued after the 28 hour test. Petersen concluded that either the weak response from the monitoring wells indicates a low degree of hydraulic communication between the groundwater monitoring wells or the distance from these wells to the pumping well was too great for a potentiometric response to be measured. Overall, hydraulic conductivity rates for the course grained alluvial groundwater system were calculated to be relatively high at 6×10^2 cm/sec or 170 feet/day.

Faults and fractures

Faults and fractures can act as effective conduits for ground water flow but can also be barriers to flow, especially to flow across the fault plane. The location of the Tropic Shale ridge that is located in the central portion of the permit area and is likely associated with the Sink Valley Fault provides a hydrologic barrier to groundwater flow originating from the eastern upland area. A readily observable pattern is shown on infrared aerial photography maps that concentrations of water represented in the varying forms of vegetation. These patterns show up as pink areas on the infrared maps. The Tropic Shale ridge clearly is showing that the alluvial groundwater is intercepted by the shale ridge and deflected toward the south. Infrared aerial and aerial photography maps of the Coal Hollow permit and adjacent area are included as Plates 2 and 3 in Appendix A. Only one spring originating in the Dakota Formation fault/fracture system about 1 mile south of the permit area is known to exist and this spring discharges negligible amounts of groundwater.

Groundwater Flow Characteristics

Once recharge enters the ground, the rate and direction of ground-water flow is governed mainly by gravity and geology. Since the source of the groundwater originates in the Paunsaugunt Plateau to the east, groundwater migrates toward the permit area from the massive alluvial fan sediments that are considered the primary transport mechanism of supplying groundwater to the springs, seeps and valleys in and around the permit area.

Ground water tends to flow more readily through shallower systems where weathering and fracturing produce hydraulic conductivities that are generally larger than in deeper systems. Much of the ground-water flow continues both laterally and downward through these shallower, local systems until it intercepts the surface and is discharged at a spring or seep, enters a stream

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as baseflow, is transpired by vegetation, or simply evaporates to the atmosphere. Because of the lithic characteristics of the Tropic Shale and Dakota Formation's groundwater is primarily confined to the alluvium and not expected to infiltrate into deeper underlying strata (i.e. Navajo Sandstone).

Tritium and radiogenic carbon values are typically used to date the groundwater residence time within an aquifer system. This information is useful in determining the age of groundwater and how often a groundwater system recharges. Tritium in the atmosphere is the result of atomic weapons testing that has occurred over the past 100 years. Tritium present in groundwater indicates that groundwater has made contact with the atmosphere and suggests it is of relatively recent age. Radiocarbon measurements of groundwater indicate how long groundwater has become isolated from soil-zone gasses and near-surface groundwater.

Tritium testing of groundwater and surface water from springs, wells, and streams in the Coal Hollow Mine permit/adjacent area was found to primarily be of modern ages. The Petersen report concluded that travel time of groundwater in Sink Valley was less than 50 years. All alluvial groundwater in Sink Valley indicates that recharge rates have occurred in modern times. The only exception to this was groundwater found in the Dakota Formation, which was determined to be isolated from the surface for at least the past 50 years and a groundwater residence time of approximately 1,000 years. The results of this testing indicate that the shallow groundwater system is relatively dynamic from the Paunsaugunt Plateau recharge area to discharge points located in Sink Valley.

There are numerous seeps and springs within the CIA. Discharge volumes are summarized in Table 1 below. Petersen Hydrologic LLC identified 38 seeps and springs in and adjacent to the permit area in their 2008 baseline survey. Most of the springs and seeps in and adjacent to the permit area have been identified within the alluvial groundwater systems in Sink Valley. Springs SP-3 and SP-5 are located in upland areas southeast of the permit area. These springs are considered to be part of the groundwater recharge source area within the Paunsaugunt Plateau and will not be affected by mining activities. Two springs that discharge in the lower Sink Valley Wash area, SP-4 and SP-34. The discharge from these springs is thought to be from either alluvium or faulting in the valley. The discharge from these springs is negligible with less than 1 gallon per minute being reported. Neither of these springs have any water rights associated with them. Spring SP-37 is utilized for stock water and wildlife and is located at the eastern edge of Sink Valley. This spring discharges at less than 1 gallon per minute. Three springs are used for seasonal domestic water supply for the three residential properties in the adjacent area. SP-8 (Swapp Ranch House), SP-33 (Johnson cabin) and SP-35 (Sorensen Ranch House) each have variable discharge rates. The highest yielding spring is the spring located at the Swapp Ranch House with an average gpm of 14.31. Multiple springs to the west of and along the northeast/southwest trending boundary of the permit area are used for stockwater and support wildlife. Many of these springs may be dislocated when mining development commences.

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Bank seepage occurs along Lower Robinson Creek in Section 19, T. 39 S., R. 5 W. The Petersen report concluded that is from the alluvial groundwater where the potentiometric surface of the groundwater intersects the stream channel. Based on data from the springs that have been monitored, spring discharge is distributed roughly as follows:

<u>Lithologic Unit</u>	<u>Number of Springs Included in Survey</u>	<u>Number of Springs Monitored</u>	<u>Total Average Monitored Discharge</u>
Alluvium	35	27	1.54 gpm
Sorenson Spring (Alluv.)	-	-	0.02 gpm
Johnson Spring (Alluv.)	-	-	6.20 gpm
Dames Spring (Alluv.)	-	-	14.31 gpm
Tropic Shale Formation	0	0	n/a
Dakota Formation	3	3	0.36 gpm

Hydraulic Conductivity and Permeability

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 and after the sediments were lithified. Lateral and vertical variations in these characteristics can create internal low-permeability zones or barriers, so that a unit that to the eye appears to be uniform and to have aquifer characteristics can actually be incapable of storing or transporting water in any significant amount.

The initial field investigation conducted in and adjacent to the permit area was designed to:

- 1) Better define the vertical and lateral extent of permeable, coarse-grained sediments in the alluvial groundwater system;
- 2) Characterize the water bearing and water transmitting properties of alluvial sediments and;
- 3) to evaluate the degree of hydraulic communication between the coarse-grained portion of the alluvial system in Sink Valley and the clayey alluvial sediments in the proposed mining areas.

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The tasks performed as part of the initial field investigation included: A total of 30 monitoring wells were drilled in and adjacent to the permit area. A 28-hour pump test was conducted at well Y-61 located within the coarse alluvial sediments east of the permit area in the northwest portion of Section 29, T. 39 S., R. 5 W. Finally, slug testing was performed on 20 monitoring wells to determine approximate hydraulic conductivity values within the various formations.

Groundwater inflow values were determined based on the results of slug tests and calculated using Darcy's Law:

$$Q = KIA$$

Where Q = groundwater discharge rate
 K = hydraulic conductivity
 I = hydraulic gradient
 A = cross-sectional area

The data from the slug tests indicate that hydraulic conductivity in monitoring wells in the Lower Robinson Creek area and in the Dakota Formation above the coal seam was negligible, with transmissivity of groundwater being less than one gallon per minute. Significant transmissivity rates in the tests performed in wells in the Sink Valley area are summarized in the table below.

Well ID	Formation	Conductivity Value (Maximum) cm/second
Y-61	Coarse alluvium (artesian system)	6.0×10^{-2}
C7-20'	Shallow Sink Valley clayey alluvium	8.3×10^{-4}
C2-28'	Mid to Lower Sink Valley sandy, silty, clayey alluvium	5.3×10^{-3}
SS-75'	Lower Sink Valley coal burned area	$>10^{-2}$
Y-98	Upper Robinson Ck drainage	3.2×10^{-2}
Y-38	Smirl Coal Seam	6.3×10^{-5}

Groundwater inflow rates into mine openings were estimated based on these data. The report concludes that groundwater inflow rates into the northwest corner of Section 29, 39 S., R. 5 W., which is considered the artesian alluvial groundwater system (C2 area), inflow rates are estimated at less than 10 gallons per minute. The report emphasized that these numbers were general estimates and if mine openings were to intersect a substantial thickness of coarse-grained material, that inflow rates could be much greater. The greatest hydraulic conductivity value was found in the burned out coal zone at the southern end of the permit area and encountered at a

depth of 75 feet in borehole SS. The conductivity value presented was $>10^{-2}$ and listed as high with data indicating mine inflow rates of 220 gpm over 100 linear feet. Rates of alluvial groundwater flow intercepted by the Coal Hollow project are expected to be variable due to the heterogeneity of the deposits. ACD estimates that groundwater on the order of a few tens of gallons per minute to several hundred gpm could be expected to be encountered.

Section 728.333 and Appendix 7-9 address specific protocols that the mine plans to implement in order to manage large, unexpected inflows of groundwater into the mine pits. Large cross-sectional areas of water-bearing strata will not be exposed to the mine pits because allowing the pits to flood would be prohibitive to coal extraction activities. Data show hydraulic conductivity values are highest in the area of a section of burned out coal located in the southern corner of the permit area. This area was documented at a depth of 75 feet in borehole SS. This area could experience high levels of groundwater inflow if it is encountered. According to page 7-28 of the MRP, the mine intends to avoid this highly permeable area by delineating the competent coal seam from the burned out section in order to design mining opening that will avoid exposing the burned (highly permeable) coal section.

Water Quality

The alluvial sediments in the Coal Hollow Mine permit area primarily consist of low permeable clays, silts, and sands derived mainly derived from the Tropic Shale that do not appear to readily transmit water. Deeper, coarser alluvia, especially on the east side of Sink Valley Wash are derived from Cretaceous and Tertiary strata exposed along the canyons of the Paunsaugunt Plateau east of Sink Valley Wash. Because appreciable amounts of groundwater originating from the Tropic Shale are not anticipated to flow out of the mine pit areas, minimal to no impacts to important water quality parameters in receiving surface and groundwater resources are expected to occur. Similar to the Tropic Shale, the coal-bearing Dakota Formation is not anticipated to have any adverse affects to water quality parameters. The Dakota was found to contain low-permeable shales and interbedded sandstone lenses which data has shown to be a poor transmitter of groundwater.

Since the alluvial sediments have been demonstrated to be the primary unit of importance in the permit and adjacent area for the transport of groundwater, water quality parameters could be adversely affected when mine workings intercept flow. One of the most important water quality parameters is Total Dissolved Solids (TDS), which is a measure of the amount of dissolved sediment in the ground and surface water systems.

Under the Standards of Quality for Waters of the State of Utah (UAC R-317-2.13), waters in Kanab Creek and its tributaries - from irrigation diversion at the confluence with Reservoir Canyon to headwaters - are classified as, 2B, 3A and 4.

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- 2B - Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing;
- 3A - Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain;
- 4 - Protected for agricultural uses including irrigation of crops and stock watering

Water originating from Water Canyon and Swapp Hollow is good quality from the Paunsaugunt Plateau on the eastern flank of Sink Valley. As surface water travels down the canyons and makes contact with the silty, clayey, sandy sediments from the alluvium and Tropic Shale formation, surface water quality generally degrades and higher levels of TDS are detected. Depending on the duration of contact, water quality degrades downstream to where TDS levels reaching 3,000 mg/L are not uncommon.

Total Dissolved Solids (TDS) in Surface Water Systems

In the Paunsaugunt Plateau, water quality is good in headwater areas and produces some of the freshest water in the region, where rocks contain only small amounts of readily soluble material. TDS concentrations are typically less than 300 mg/L and dominant ions are calcium, magnesium and bicarbonate. TDS concentrations increase at lower elevations, where stream waters flow along more saline sediments such as the alluvium and the Tropic Shale. Overall, surface water quality in the Kolob-Alton coal field region is considered fresh to moderately saline with TDS values ranging from 250 – up to 10,000 mg/L (Price, 1980). Surface water TDS values in Sink Valley typically range from 250 – 1,000 based on heavy flow to low flow conditions that vary by the season. TDS levels are naturally highest in Kanab Creek and Sink Valley drainages, mainly due to the general degradation of water quality as it travels and continues to make contact with sediment. TDS concentrations in the surface water drainages range from 500 – 3,000 mg/L.

TDS in Groundwater Systems

Overall, groundwater quality in the Kolob-Alton coal field region is considered fresh to slightly saline with TDS values ranging typically from <1,000 to 3,000 mg/L (Price, 1981). The freshest groundwater originates in the high plateau areas as well as at the headwaters of Kanab Creek. In these areas, TDS values are typically less than 500 mg/L. More saline water is found in the Tropic Shale with TDS concentrations in groundwater typically ranging anywhere from 500 to 10,000 mg/L. TDS groundwater values within Sink Valley have been reported to range from 500-3,000 mg/L.

Aquatic Species

Streams in and adjacent to the Coal Hollow Mine flow in response to rainfall and snowmelt. Although there are episodes with high flow volumes, the channels are typically dry for several months out of each year and flow is too inconsistent to provide any aquatic habitats for fish. Amphibians and macroinvertebrates may survive in reaches of Kanab Creek west of the Coal Hollow Mine, but Lower Robinson Creek and Sink Hollow Wash do not support aquatic habitats.

Limited aquatic resources are found within the Kanab Creek drainage. Aquatic species, reptiles and mollusks, have been documented in the Kanab Creek drainage to include both native and nonnative fish species.

Fish Species	Native (Y) or Non-Native (N)	General Habitat
Speckled dace	Y	Wide variety of water conditions and habitats, marshy wetlands to large streams
Mountain Sucker	Y	Riffles in clear, cold creeks and rivers in mountains
Rainbow Trout	N	Wide range of habitat including large, deep lakes, rivers and small streams.

Relatively few wetlands have been documented in the Kanab Creek/Virgin River Drainage Basin. Small seep or pothole-type wetlands act as water reserves and provide baseflows that can support aquatic communities during low-water periods. Potholes, small ponds and marshy areas provide subsurface flow that supplements direct water sources like springs and run-off. These wet areas also provide important habitat for invertebrate and amphibian populations. Waterfowl habitat areas are limited to a few "potholes and marches" created by seepage from farm ponds.

The Kanab Creek drainage does not support significant habitat for sport fisheries. Flows are considered too small to provide adequate habitat for fish. Limited aquatic habitat is possible in the upper stream reaches, which would include the Alton/Sink Valley area.

Surface Water Baseline Conditions

Surface runoff from the permit and adjacent area are directed to two principal drainage basins in the region. In the lower half of the permit area and the eastern half of Sink Valley, surface water drainage is directed to the Sink Valley Wash Drainage. Surface waters in the remainder of the permit area drains to a smaller basin known as the Lower Robinson Creek subdrainage, which is a part of the larger Upper Kanab Creek Drainage basin. The Sink Valley

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Wash is a tributary to Kanab Creek where the confluence of the two water bodies is located approximately 6 miles south of the permit area. Runoff in the Alton-Kolob region is generated from precipitation that falls directly on the area and snowmelt. The contributing area of Dry and Water Canyons and Swapp Hollow is approximately 5,080 acres. The area of Sink Valley is about 730 acres. Price (1982) gave mean averages in the Sink Valley area from 1 to 8 inches per year (Price 1982), but data from the Alton, Utah weather station indicate average annual precipitation of 16.38 inches per year (Appendix 7-6). ACD has maintained a weather station at the Coal Hollow permit area since 2006, and data from this station are in Appendix 7-6 of the Coal Hollow Mine MRP.

Dry Canyon

This drainage delineates the north and northeastern-most boundary of the CIA and represents the headwaters of Lower Robinson Creek. The surface and groundwater that originates in Dry Canyon follows a southwesterly gradient. Any runoff from heavy precipitation events from this canyon is directed west toward Lower Robinson Creek. The alluvial sediments originating from this canyon and Water Canyon form the geomorphic features of the alluvial fan structure found along the eastern flank of Sink Valley. Because this canyon is upgradient of proposed mining operations, surface and groundwater originating from this canyon will not be affected by any mine operations. For surface water baseline sampling purposes, the sampling point from this canyon is referred to as RID-1 – Robinson Creek.

Water Canyon

The surface and groundwater that originates in Water Canyon follows a southwesterly gradient. Surface runoff from Water Canyon is shown on topographic maps as intermittent. However, surface water monitoring has not detected flow since the baseline water monitoring program began in 2005. Runoff from Water Canyon is directed toward Robinson Creek. Because this canyon is upgradient of proposed mining operations, surface and groundwater originating from this canyon will not be affected by any mine operations. For surface water baseline sampling purposes, the sampling point from this canyon is referred to as SW-7 – Swapp Hollow (Adjacent).

Swapp Hollow

This drainage delineates the eastern-most boundary of the CIA. Surface water originating from Swapp Hollow Canyon may have at one time drained into a channel that existed in Sink Valley, which is now buried beneath the alluvial fan. Currently, there is no continuous stream channel in Sink Valley. However, landform features of dried up channels can be seen in 2009 aerial photographs.

The surface water monitoring point midway up the canyon consistently reports flow. The data from the baseline monitoring period beginning in 2005 have reported flows ranging from 2.0

gpm through 290 gpm. Because this canyon is upgradient of proposed mining operations, surface and groundwater originating from this canyon will not be affected by any mine operations. For surface water baseline sampling purposes, the sampling point from this canyon is referred to as SW-8 – Swapp Hollow.

Sink Valley

Remnants of an old stream channel appear in Sink Valley. The Division has observed that this channel, shown on the USGS Alton Topographic Quad and evident on the ground, is a feature superimposed on the alluvial fan: it has not created a floodplain; it originates near the head of the fan in Section 21 Canyon, where sheetwash collects into rills and channels, and is augmented by flow from Swapp Hollow and several smaller drainages

The channel appears discontinuous when viewing current aerial photographs. The only surface water monitoring point in Sink Valley (SW-6) is located adjacent to the southeast corner of the permit boundary near a spring. Surface flow from this point has only been detected twice since the beginning of the baseline monitoring period in 2005 during the spring season. Although appreciable amounts of groundwater are found in zones of coarse alluvium within Sink Valley, surface water expression is infrequent. Surface water runoff near monitoring point SW-6 (adjacent to the southeast boundary of the permit area) does have potential to increase upon the inception of mining activities due to the diversion of water being directed southward (i.e. downgradient) from the mine pits.

Lower Sink Valley Wash

Lower Sink Valley begins in the northeast corner of Section 6, T. 40 S., R. 5 W where the county road crosses the drainage and the channel looking south becomes significantly incised. There are only two surface water monitoring points in Lower Sink Valley Wash: SW-9 and SW-10. Similar to surface water conditions in Sink Valley, surface water has only been measured twice - in March 2006 and March 2008 - since the beginning of the baseline monitoring period in 2005, although data from the 1980s in the Division's database show episodic flow as great as 763 gpm. No development and no active water rights exist in this area. These surface water monitoring points do have potential to be impacted by upgradient mining activities in the form of increased runoff. However, the closest monitoring point in Lower Sink Valley Wash is 1.5 miles downstream of the permit area boundary. The effects of mining, if any, this far downstream are not yet known, but will require close monitoring.

Kanab Creek

Kanab Creek is a tributary of the Colorado River that originates at the base of the Paunsaugunt Plateau at Reservoir Canyon east of Alton, Utah and flows 29.7 miles south through the town of Kanab, Utah to the Utah-Arizona state line. Perennial headwaters reach a maximum

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of 8,300 feet elevation, while Kanab Creek exits the state at 4,700 feet. There are no lakes or reservoirs in the drainage catalogued by the Utah Division of Wildlife Resources (Hadley, 2007).

On a regional scale, Kanab Creek flows to the south and is a part of the Colorado River Basin and ultimately discharges to the Colorado River. The Colorado River Basin drains approximately 246,000 square miles, including parts of seven western U.S. states (Wyoming, Colorado, Utah, New Mexico, Nevada, Arizona, California) and Mexico. Three-fourths of the Colorado basin is federal land comprised of national forests, national parks, and Indian reservations (Water Encyclopedia). Surface water in Kanab Creek is primarily used for stock watering and crop irrigation in irrigable areas further west of the permit area.

Robinson Creek

In the Robinson Creek drainage, water in the form of precipitation or snow melt originates in the upper reaches of the stream from Water Canyon and other canyons east of the permit area on the Paunsaugunt Plateau. Robinson Creek exhibits geomorphic features of a highly incised natural channel that is often dry but likely receives water from torrential rainstorms.

The data show that stream flow significantly drops off as it continues downstream to where Lower Robinson Creek drains to Kanab Creek. The Kanab Creek drainage shows consistent spring and fall seasonal flow along all the sampling points on the creek. During spring runoff season, stream flow does steadily decrease as it travels downstream.

Water Canyon and Swapp Hollow Canyon are represented by surface water sampling points SW-7 and SW-8, respectively. Interestingly, no stream flow data has been detected in Water Canyon during the baseline monitoring period. Conversely, data from Swapp Hollow Canyon do show consistent stream flow data throughout the year. Surface water points SW-6, SW-9, and SW-10 represent sampling locations along Sink Valley and Sink Valley Wash. Baseline stream flow data show that flow is detected only during spring runoff season. These three points will be the surface water points that have potential to see effects to surface water runoff from mining activities, especially if groundwater flow is to be redirected away from the mining pits.

Baseline surface water monitoring at the Coal Hollow mine site began in June 2005 and has been collected on a quarterly basis ever since. Surface water collection points are shown on Drawing 7-2 of the Coal Hollow Mine MRP. The principal drainage systems in the permit and adjacent area are: Lower Robinson Creek, Kanab Creek, Water Canyon, Swapp Hollow, and Sink Valley. Table 3 below indicates the minimum and maximum flows recorded since 2005 along with mean flow data where available. As can be seen on Table 3, the principal drainages are grouped together with the upstream to downstream locations grouped left to right.

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**TABLE 3
 SEASONAL SURFACE WATER FLOW DATA**

RID-1 Robinson Creek				SW-4 Robinson Creek				SW-101 Robinson Creek				SW-5 Robinson Creek			
Flow in gpm				Flow in gpm				Flow in gpm				Flow in gpm			
Month	Min	Max	Avg.	Month	Min	Max	Avg.	Month	Min	Max	Avg.	Month	Min	Max	Avg.
March	-	13	-	March	-	-	-	March	21	777	399	March	-	-	-
April	-	-	-	April	-	-	-	April	-	-	-	April	-	-	-
May	3.5	48.6	24	May	-	539	-	May	-	734	-	May	5	410	207
June	-	-	-	June	-	-	-	June	-	-	-	June	-	-	-
July	-	2.8	1.4	July	-	-	-	July	-	-	-	July	-	-	-
August	-	-	-	August	-	-	-	August	-	-	-	August	-	-	-
September	7	60	33	September	-	-	-	September	-	-	-	September	-	5	-
October	-	-	-	October	-	-	-	October	-	-	-	October	-	-	-
November	0	64.7	24	November	-	-	-	November	-	-	-	November	-	-	-
December	-	-	-	December	-	-	-	December	-	-	-	December	-	-	-

SW-1 Kanab Creek				SW-3 Kanab Creek				Lamb Canal - Kanab Creek				SW-2 Kanab Creek			
Flow in gpm				Flow in gpm				Flow in gpm				Flow in gpm			
Month	Min	Max	Avg.	Month	Min	Max	Avg.	Month	Min	Max	Avg.	Month	Min	Max	Avg.
March	0	2770	1471	March	191	4170	2351	March	-	372	-	March	-	21	-
April	-	-	-	April	-	-	-	April	-	-	-	April	-	-	-
May	158	1830	994	May	37	1850	530	May	14.6	1560	450	May	3.4	934	264
June	-	-	-	June	-	-	-	June	-	-	-	June	-	-	-
July	-	-	-	July	-	37	-	July	0	0	0	July	-	8	-
August	-	-	-	August	-	-	-	August	0	0	0	August	-	-	-
September	68	161	115	September	85	119	104	September	0	300	106	September	5.4	36	24.53
October	-	-	-	October	-	-	-	October	-	-	-	October	-	-	-
November	300	893	632	November	320	1970	900	November	0	0	0	November	-	430	-
December	-	-	-	December	-	-	-	December	-	-	-	December	-	-	-

SW-7 Swapp Hollow Adjacent				SW-8 Swapp Hollow				SW-6 Sink Valley Wash				SW-9 Sink Valley Wash				SW-10 Unnamed Tributary to Sink Valley			
Flow in gpm				Flow in gpm				Flow in gpm				Flow in gpm				Flow in gpm			
Month	Min	Max	Avg.	Month	Min	Max	Avg.	Month	Min	Max	Avg.	Month	Min	Max	Avg.	Month	Min	Max	Avg.
March	-	-	-	March	-	34	-	March	58	1370	714	March	11	182	96.5	March	15	247	131
April	-	-	-	April	-	-	-	April	-	-	-	April	-	-	-	April	-	-	-
May	-	-	-	May	11	290	87	May	-	-	-	May	-	-	-	May	-	-	-
June	-	-	-	June	-	-	-	June	-	-	-	June	-	-	-	June	-	-	-
July	-	-	-	July	-	2.05	-	July	-	-	-	July	-	-	-	July	-	-	-
August	-	-	-	August	-	-	-	August	-	-	-	August	-	-	-	August	-	-	-
September	-	-	-	September	10	69	43	September	-	-	-	September	-	-	-	September	-	-	-
October	-	-	-	October	-	-	-	October	-	-	-	October	-	-	-	October	-	-	-
November	-	-	-	November	13	71	39	November	-	-	-	November	-	-	-	November	-	-	-
December	-	-	-	December	-	-	-	December	-	-	-	December	-	-	-	December	-	-	-

Baseline TDS data in Surface Water

Another water quality parameter that has significant effects to the quality of surface water is TDS concentration. TDS is an indicator of how much sediment load a water body is carrying: the lower the TDS concentration in surface water, the fresher the water. As previously mentioned, data published by the U.S. Geological Survey (Price 1980) indicated that TDS data in the drainage basins of Kanab Creek and Sink Valley typically range from 500 – 3,000 mg/L. Table 4 shows concentrations of TDS in each of the drainages relevant to the permit and adjacent area. The drainages are grouped together in rows with the upgradient to downgradient sampling locations shown from left to right. TDS levels originating from the upland areas of the Robinson Creek drainage show TDS levels under 300 mg/L, as what was reported by USGS data back in the 1980s.

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TABLE 4
 Total Dissolved Solids in Surface Water

RID-1 Robinson Creek				SW-4 Robinson Creek				SW-101 Robinson Creek				SW-5 Robinson Creek			
TDS in mg/L				TDS in mg/L				TDS in mg/L				TDS in mg/L			
Month	Min	Max	Avg.	Month	Min	Max	Avg.	Month	Min	Max	Avg.	Month	Min	Max	Avg.
March	-	254	-	March	-	-	-	March	644	3012	1828	March	-	-	-
April	-	-	-	April	-	-	-	April	-	-	-	April	-	-	-
May	186	265	225	May	-	283	-	May	-	309	-	May	469	1205	837
June	-	-	-	June	-	-	-	June	-	-	-	June	-	-	-
July	-	203	-	July	-	-	-	July	-	-	-	July	-	-	-
August	-	-	-	August	-	-	-	August	-	-	-	August	-	-	-
September	-	245	-	September	-	-	-	September	-	-	-	September	-	1081	-
October	-	-	-	October	-	-	-	October	-	-	-	October	-	-	-
November	250	273	262	November	-	-	-	November	-	-	-	November	-	-	-
December	-	-	-	December	-	-	-	December	-	-	-	December	-	-	-

SW-1 Kanab Creek				SW-3 Kanab Creek				SW-2 Kanab Creek			
TDS in mg/L				TDS in mg/L				TDS in mg/L			
Month	Min	Max	Avg.	Month	Min	Max	Avg.	Month	Min	Max	Avg.
March	530	1238	884	March	418	1167	713	March	-	1511	-
April	-	-	-	April	-	-	-	April	-	-	-
May	578	815	697	May	644	1372	1146	May	853	1672	1300
June	-	-	-	June	-	-	-	June	-	-	-
July	-	-	-	July	-	1358	-	July	-	1771	-
August	-	-	-	August	-	-	-	August	-	-	-
September	1095	1293	1227	September	85	119	104	September	1434	1725	1595
October	-	-	-	October	-	-	-	October	-	-	-
November	442	1085	660	November	1206	1281	1248	November	-	1513	-
December	-	-	-	December	-	-	-	December	-	-	-

SW-8 Swapp Hollow				SW-6 Sink Valley Wash				SW-9 Sink Valley Wash				SW-10 Unnamed Tributary to Sink			
TDS in mg/L				TDS in mg/L				TDS in mg/L				TDS in mg/L			
Month	Min	Max	Avg.	Month	Min	Max	Avg.	Month	Min	Max	Avg.	Month	Min	Max	Avg.
March	-	324	-	March	1028	3575	2301.5	March	360	1270	815	March	-	236	-
April	-	-	-	April	-	-	-	April	-	-	-	April	-	-	-
May	305	366	344	May	-	-	-	May	-	-	-	May	-	-	-
June	-	-	-	June	-	-	-	June	-	-	-	June	-	-	-
July	238	274	256	July	-	-	-	July	-	-	-	July	-	-	-
August	-	-	-	August	-	-	-	August	-	-	-	August	-	-	-
September	298	353	327	September	-	-	-	September	-	-	-	September	-	-	-
October	-	-	-	October	-	-	-	October	-	-	-	October	-	-	-
November	321	377	345	November	-	-	-	November	-	-	-	November	-	-	-
December	-	-	-	December	-	-	-	December	-	-	-	December	-	-	-

Downstream data from Lower Robinson Creek do show increased levels of TDS in the drainage within the permit boundary and at the confluence of Lower Robinson Creek and Kanab Creek. Limited data show SW concentrations of TDS reaching slightly above 3,000 mg/L in Robinson Creek. It is anticipated that with the construction of Coal Hollow Mine surface facilities near Lower Robinson Creek, there would be a potential for increased contributions of sediment to Lower Robinson Creek and therefore sediment control practices in accordance with the Utah Coal Rules would need to be closely monitored in this area.

TDS concentrations in Kanab Creek from monitoring points SW-1 and SW-3 averaged

approximately 1,200 mg/L. Concentrations of TDS increased slightly in downstream sample SW-2, with limited data showing a maximum concentration of 1,771 mg/L. The upgradient stream sample locations, SW-1 and SW-3 would not be effected by the inception of mining activities. However, SW-2 is downgradient of the confluence of Lower Robinson Creek and has the potential to see increases to sediment loads from mining activities.

TDS concentrations in the Swapp Hollow drainage show concentrations consistent with a fresh water classification.

Perched Water-Bearing Zones

There appears to be a perched aquifer effect adjacent to the Coal Hollow Mine. Petersen Hydrologic reported that perched groundwater conditions exist locally in the alluvial groundwater system in the Lower Robinson Creek subdrainage (Section 11.1, Appendix 7-1). As spring and stream flow moves down the canyons it infiltrates into the matrix at the head of the alluvial fan. In its downward movement it comes in contact with finer lentils materials then moves horizontal until it comes to the surface. This feature is seen in the wet areas (A and B) and spring discharges described by the Coal Hollow Mine MRP.

Anderson (1991) indicated two aquifers on his cross section. The pump test at Y-61 produced drawdown in wells screened in the same deeper, coarser materials that Y-61 was pumping from, but flows in springs at the surface were also reduced. The alluvial groundwater system is probably not homogeneous and anisotropic, but rather is a series of more permeable and less permeable materials with varying degrees of interconnectivity.

These systems may not always be perched in the strict sense, because they may be underlain or even enveloped by saturated low-permeability rock, but large contrasts in hydraulic conductivity effectively isolate them.

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IV. IDENTIFY HYDROLOGIC CONCERNS

GROUND WATER

Groundwater systems in the permit and adjacent area have been identified within four formations: Navajo Sandstone, Dakota Formation, Tropic Shale and the overlying alluvium. The Navajo Sandstone has been ruled out as having any impacts to the hydrologic balance of the permit and adjacent area since it does not outcrop in the area, is separated from the Smirl Coal Seam by several hundred feet of low permeability strata, and will not be encountered during surface mining activities. The Dakota and Tropic formations are considered poor transmitters of groundwater in the permit/adjacent area and are not considered a significant source of groundwater that could affect the hydrologic balance. The alluvial groundwater system supports springs, seeps and provides the groundwater source for several wells within the permit/adjacent area and is considered the formation of primary importance to the hydrologic balance.

Page 7-25 of the Coal Hollow MRP identifies three potential mechanisms of producing hydrologic consequences of surface mining activities in the Coal Hollow Permit Area. They are:

1. Where water-bearing strata in the proposed mining areas are mined through, groundwater systems within these strata will obviously be directly intercepted,
2. Where groundwater flow paths through mine openings are interrupted, groundwater flow in down-gradient areas could be diminished, and
3. Where mine openings intercept permeable strata, groundwater resources in up-gradient areas could potentially be diminished if appreciable quantities of groundwater were to be drained from up-gradient areas.

Thirty springs and seeps are being monitored within and adjacent to the Coal Hollow permit and adjacent area. Average flows from baseline monitoring of springs within and adjacent to the permit area are presented in the table below.

SPRING ID	LOCATION	FLOW (in gpm)
BLM-1	Kanab Creek	3.4
SP-4	Lower Sink Valley Wash – Dakota Fm Fracture	0.7
SP-6	Alluvium - seep in Sink Valley	0
SP-8	Alluvial spring at Dames Ranch	16
SP-14	Alluvium - Sink Valley	3.9
SP-16	(Teal Spring) - Alluvium -	0.9

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	Sink Valley	
SP-19	(Sorenson Pond)- Alluvium - Sink Valley	0.23
SP-22	Alluvium - Sink Valley	0.27
SP-23	Alluvium - Sink Valley	0.8
SP-33	Alluvium - Johnson Property Spring	14
SP-40	Sorensen Spring	0.51

Springs on the east side of the permit boundary area in Sink Valley such as the Sorensen Spring (SP-40) and Sorenson Pond (SP-19) along with several others on the east side of the permit boundary in Section 29 are upgradient of the mine and will not likely be effected by mining activities. Springs that will be effected by mining activities when the mine pits are constructed will be the springs within the permit area along the northeast to southwest permit boundary: these include SP-14, SP-22, and SP-23. Currently, these springs are used for stockwatering. The mine plan in the MRP states that groundwater flow that feeds these springs will be intercepted by an engineered barrier to be installed further to the west of these springs. The photo below show one of these springs within the permit boundary. The view is to the south with the fence line noted in the background.

Most of the springs show an average annual flow of less than one gallon per minute. Springs with significant flow include the springs located near the residential properties that are used for domestic purposes. These springs include SP-8 near the Dames property and SP-33 near the Johnson property. Neither of these springs is likely to show any effects from mining activities since their groundwater recharge source is to the east and consequently upgradient of mining activities.

Ground Water Intercepted by Mining

Groundwater resources in the relatively impermeable Tropic Shale are considered meager and therefore unlikely that appreciable amounts of groundwater would be intercepted within this formation. Similarly, groundwater resources within the Dakota Formation are also considered meager. The coal seam within the Dakota Formation will be extracted but the underlying strata will not be disturbed. Consequently, adverse impacts to direct interception of groundwater with these two formations are not considered to be significant.

Alluvial groundwater systems in the permit area will be directly intercepted by mining activities. The areas of permeable strata that are to be excavated for mining activities have the potential to drain groundwater resources in the upgradient areas. Hydraulic conductivity data available from the artesian alluvial groundwater system found in the coarsest alluvium (well C2 area) indicate a "worst case" scenario discharge rate from mine inflows is estimated to be less

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than 10 gallons per minute. The permeability of backfill materials that will be placed into the mine pits during operations also needs to be considered in a groundwater permeability analysis. The potential for the migration of appreciable quantities of groundwater through fill material is considered low because the material will be clay rich in nature and the material has low permeability characteristics (Coal Hollow Mine MRP Appendix 7-10). In the event that appreciable amounts of groundwater inflows into the mine pits do occur, ACD has proposed to install a permanent, engineered low-permeability barrier adjacent to the undisturbed alluvial sediments along the eastern edge of the permit boundary. The objective of this barrier is to prevent significant inflows of groundwater into the mine pits and minimize long term impacts to subirrigation and soil moisture that could affect the hydrologic balance. The design details of this engineered barrier can be found in the Coal Hollow MRP, Appendix 7-10.

If mining operations do encounter groundwater in the mine workings, the water would need to be discharged to the surface drainages. Mine water will ultimately be discharged to the Sink Valley Wash drainage.

Diminution of Down-Gradient Ground Water Resources

When areas to be mined intercept groundwater flow paths, there is the potential that diminution of down-gradient groundwater resources could occur. As previously mentioned, groundwater resources in the Tropic Shale and Dakota Formation formations transmit meager amounts of groundwater and do not provide measureable baseflow to streams down-gradient of mining areas.

Alluvial groundwater systems in Sink Valley tend to show the highest rates of hydraulic conductivity along the eastern flanks of Sink Valley in areas where the coarsest alluvial deposits are mapped. A preferential pathway through the deep coarse-grained alluvial sediments originates in this area. In contrast, the total flux of groundwater migration through finer, clayey and silty sediments on the western portions of Sink Valley is considerably less. Because of the presence of the Tropic Shale ridge barrier, a potential consequence of this barrier being excavated is that the overall direction of groundwater gradient could shift to a more west/southwesterly direction as opposed to the current flow path which is directed more to the south. As a result, the springs located in Section 32, T. 39 S., R. 5 W. may see a decrease in flow due to any possible redirecting of groundwater resources. The most productive spring in this potentially affected area is the Johnson Spring (SW-33). Currently, under baseline conditions this spring averages 14 gallons per minute annually. Mining operations have the potential to impact this spring and produce hydrologic consequences.

Draining of Up-Gradient Groundwater Resources

Based on information from water monitoring wells, including slug tests and a pumping and recovery test of Y-61, and analysis of the geology and hydrology of the proposed permit and

adjacent area, the Coal Hollow Mine is designed to minimize potential diminution of flow from the alluvial springs in the Coal Hollow Mine permit and adjacent area.

The pump at Y-61 was stopped at the end of the 28-hour pumping test, and spring discharge rates and water levels in alluvial monitoring wells recovered to approximate pre-test levels. Figure 18 in Appendix 7-1 of the MRP shows the drawdown and recovery response of four wells (C2-40, C3-40, C4-30, and SS-30) and three springs (SP-20, SP-8, and SP-14). The observation springs were 750 to 1,400 and the wells 1,800 to 4,400 feet from the pumping well. Drawing 7-14 illustrates the drawdown at C2-40 and two other wells, Y-102 and Y-59, which were within 1,000 of Y-61; drawdowns at more distant wells are too small to show at the scale on that drawing.

The relationship of the alluvial ground-water table to wells and springs in and adjacent to the NW1/4 of Section 29 is crucial in understanding the PHC of the proposed mining operation. Figure 18 in Appendix 7-1 indicates that during the pump test on Y-61, water levels actually increased at C2-40 and SS-30 and flow increased at SP-8 after 4 hours of pumping.

If inflows to the mine pits become excessive as mining progresses, ACD commits to use techniques such as bentonite- or clay-filled cutoff walls to minimize inflows (Appendix 7-9, Coal Hollow Mine MRP). Temporary reductions in flow from alluvial aquifers may occur but are likely to be short-lived as the pits will remain open for only 60 to 120 days.

Water replacement is discussed in Section 727. Long-term diminution of flow will be replaced with water from a well that has not been drilled yet. The town of Alton has entered into an agreement to transfer a point of diversion for water rights to 50 acre-feet of water, which ACD plans to use to satisfy the water replacement requirements: a copy of the agreement with the town of Alton is in Appendix 7-8 of the Coal Hollow Mine MRP. The planned new water well will be constructed on lands currently leased by Alton Coal Development, LLC. This well will be constructed prior to the beginning overburden removal for pits 13, 14, and 15.

Based on information from water monitoring wells, including slug tests and a pumping and recovery test of Y-61, and analysis of the geology and hydrology of the Coal Hollow Mine permit and adjacent area, ACD has concluded that the proposed mine plan is designed to minimize potential diminution of flow from the alluvial springs in the permit and adjacent area.

The MRP for ACD's Coal Hollow Mine notes that after the pump at Y-61 was stopped at the end of the 28-hour pumping test, spring discharge rates and water levels in alluvial monitoring wells recovered to approximate pre-test levels. Figure 18 in Appendix 7-1 shows the drawdown and recovery response of four wells (C2-40, C3-40, C4-30, and SS-30) and three springs (SP-20, SP-8, and SP-14). The observation springs were 750 to 1,400 and the wells 1,800 to 4,400 feet from the pumping well. Drawing 7-14 in Chapter 7 illustrates the drawdown at C2-40, Y-102, and Y-59, three observation wells within 1,000 of Y-61; Figure 18 of Appendix

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7-1 shows the smaller drawdown response at C2, C3, C4, and SS, observation wells along the eastern margin of the proposed mine; and contour lines on Figure 17 of Appendix 7-7 show the extent of the measurable drawdown in the observation wells.

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SURFACE WATER

Increased discharge, especially runoff from disturbed areas, could alter flow volumes, water quality, and runoff and flood patterns in creeks. Mining in the Alton area is not expected to increase discharge of surface or ground water beyond current levels. Creeks and drainage areas discussed are shown on Figure 19, Appendix 7-1 of the Coal Hollow Mine MRP.

AQUATIC HABITAT

Macroinvertebrates are excellent indicators of stream quality and can be used to evaluate suitability of a stream to support fish and other aquatic life. However, streams in and adjacent to the Coal Hollow Mine flow in response to rainfall and snowmelt. Although there are episodes with high flow volumes, the channels are typically dry for several months out of each year. Amphibians and macroinvertebrates may survive in reaches of Kanab Creek east of the Coal Hollow Mine, but flow in Lower Robinson Creek and Sink Hollow Wash is too inconsistent to support aquatic habitats.

Water withdrawals within the upper Colorado River Basin impact habitats of four endangered fish species in the Colorado River and its tributaries: the Colorado squawfish, razorback sucker, bonytail chub, and humpback chub. Water withdrawals from the Colorado River Basin above Lake Powell are restricted, and water withdrawals in excess of the limit could

trigger consultation requirements with the U.S. Fish and Wildlife Service (USFWS). The Coal Hollow Mine and other possible future mines covered by this Alton/Sink Valley CIA do not flow to the Upper Colorado River Basin and are not subject to these restrictions.

V. IDENTIFY RELEVANT STANDARDS AGAINST WHICH PREDICTED IMPACTS CAN BE COMPARED

The UPDES permit for the Coal Hollow mine provides some standards for water quality in the area. Utah water quality standards exist for numerous parameters other than those discussed below, but at this time there is neither evidence to indicate nor reason to believe that those parameters are of concern in the Alton/Sink Valley CIA. However, additional parameters recommended for routine monitoring in UDOGM directive Tech-004 are included in the water-monitoring plans of the Coal Hollow operation.

Flow: There is no standard for flow in the Utah water quality standards. Flow is very sporadic in Lower Sink Valley. The only measured flow in Lower Sink Valley during the pre-mining baseline monitoring period was during the springtime runoff season. Similarly, surface water measurements in Robinson Creek during the baseline period showed only occasional flow.

The UPDES General Permit for Coal Mining contains no limit on flow. Discharge is to be measured monthly, and the duration of intermittent discharge is to be reported along with flow. 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.

R645-301-731.530 and -731.800 require prompt replacement of State-appropriated water that is contaminated, diminished, or interrupted. Baseline hydrologic and geologic information is to be used to determine the impact of mining activities upon ground- and surface-water supplies.

Oil and Grease: There is no State water quality standard for oil and grease, but the limit in the UPDES General Permit for Coal Mining is 10 mg/L. Any observation of visual sheen requires a sample be taken immediately.

A 10 mg/L oil and grease limit does not protect fish and benthic organisms from soluble oils such as those used in longwall hydraulic systems, and UDWR has recommended soluble oils be limited to 1 mg/L (Darrell H. Nish, Acting Director UDWR, letter dated April 17, 1989 to Dianne R. Nielsen, Director UDOGM). Hydraulic longwall systems will not be present in the Coal Hollow Mine.

pH: Allowable pH ranges are 6.5 to 9.0 under State water quality standards for all Classes, and also under the UPDES General Permit for Coal Mining.

Total Dissolved Solids (TDS) concentrations: TDS is commonly used to indicate general

water quality with respect to inorganic constituents. Kanab Creek and its tributaries are categorized as Class 2B, 3A and 4 waterbodies. 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).

Total Suspended Solids (TSS) and Settleable Solids: There is no State water quality standard for solids in the water, but an increase in turbidity is limited to 10 NTU for Class 2A, 2B, 3A, and 3B waters. The UPDES General Permit for Coal Mining has the following allowable limits on TSS: 30-day average, 25 mg/L; 7-day average, 35 mg/L; daily maximum, 70 mg/L. TSS is to be determined by a monthly grab sample.

Under the current UPDES General Permit for Coal Mining, 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 may comply with a settleable solids standard of 0.5 ml/L daily maximum rather than the TSS standard, although TSS and the other UPDES parameters are 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: UPDES General Permit for Coal Mining limit on daily maximum for total iron is 1.0 mg/L as determined by a monthly grab sample. State water quality standards (UDWQ 2009) allow a maximum of 1,000 µg/L (1 mg/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 Utah 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. However, streams in and adjacent to the Coal Hollow Mine flow in response to rainfall and snowmelt. Although there are episodes with high flow volumes, the channels are typically dry for several months out of each year. Amphibians and macroinvertebrates may survive in reaches of Kanab Creek east of the Coal Hollow Mine, but flow in Lower Robinson Creek and Sink Hollow Wash is too inconsistent to support aquatic habitats.

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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 quantifiable reduction of the capability of an area to support fish and wildlife communities, or would cause other quantifiable adverse change to the hydrologic balance outside the permit area. The basis for determining material damage may 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.

The direct effect of mining on the hydrology of the area is mainly focused on managing the limited amount of water that is available for present uses. This means that the quantity, quality and distribution of the water must be maintained at minimum present levels. The specific objectives of this CHIA used to evaluate material damage are:

1. Determine any changes in the quality of water that reaches the off-permit stream systems
2. Evaluate the sediment load to the stream system during and after mining and reclamation

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. Based on the data from the area, there is a minimal presence of aquatic habitat in this area. Wildlife habitat most likely to be affected by the proposed Coal Hollow Mine has been determined to be sage grouse. There is no farming in the CIA; however, there is livestock grazing and an AVF in Kanab Creek west of the permit area. In accordance with R645.302.323, *"the proposed operations would not materially damage the quantity and quality of water in surface and underground water systems that supply those alluvial valley floors or portions of alluvial valley floors which are outside the permit area of an existing or proposed coal mining and reclamation operation"*.

Therefore, water-quality and quantity criteria are intended to identify changes in the present discharge regime that might be indicators of economic loss to the water users and grazing-right owners, of significant alteration to the channel size or gradient, or of loss of capacity to support existing fish and wildlife communities within the CIA. 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 and TDS.

Low-Flow Discharge Rate

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 measurements reduced the standard deviation to 16 - 17 % and 15 years of data reduced it to about 15 %. This relationship indicates that a change in low-flow rates of less than 15 to 20 % probably would not be detectable. A 20 % decrease in the low-flow rate will provide a threshold indicator that decreased flows are persisting and that an evaluation for material damage is needed. However, because flow in many streams is intermittent, material damage due to loss of flow is very unlikely, and the intermittent nature of the flow will also make any such loss almost impossible to detect. Any such apparent change in discharge would need to be correlated against precipitation and a drought index such as the PHDI.

Aside from torrential precipitation events, currently Lower Robinson Creek sees minimal surface water flows in its stream channel. With the advent of surface mining, this area may see an increase in surface water via sheet flow along the surface as mining of the disturbed areas may produce some flows following a southwesterly gradient into Lower Robinson Creek. Monitoring of surface water flow levels at Lower Robinson Creek both at the mine site and downstream sample locations will provide a means to evaluate effects of the surface water flows resulting from disturbed areas on the receiving streams. Additionally, water from disturbed areas will be monitored at the discharge from the sedimentation ponds.

Total Dissolved Solids (TDS)

The concentration of dissolved solids is commonly used to indicate general water quality with respect to inorganic constituents. Wildlife and livestock use is the designated post-mining land use for the CIA, so 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 stockwatering (Class 4) is 1,200 mg/L. However, baseline conditions in the Coal Hollow permit and adjacent area have shown in both scientific literature from the USGS field investigations and in the baseline surface water data collected, that TDS concentrations can exceed levels over 3,000 mg/L in the stream channels - especially when surface water makes contact with silty, clayey or sandy sediments. As a result, material damage criteria for excessive TDS concentrations that persistently exceed 3,000 mg/L in springs, UPDES discharges, or receiving streams, it will be an indication that evaluation for potential material damage is needed.

Parameters for Ground Water Quantity and Quality

The potential material-damage concerns of 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

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enterprises;

- Will not degrade domestic supplies;
- Would not cause structural damage to aquifers; and
- Will maintain adequate capacity for wildlife and the limited aquatic communities that exist in the area.

To assess the potential for material damage to these elements of the ground-water hydrologic system, the following indicator parameters were selected for evaluation: seasonal flow from springs and TDS concentration in spring and mine-discharge water.

Ground-water concerns will be monitored at numerous springs, wells, and UPDES discharge points. Locations are identified on Drawing 7-10 of the Coal Hollow Mine MRP. If inflow to a mine is significant or persistent, UDOGM can require monitoring of mine inflow.

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, or 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 the water 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. Wildlife and livestock use ground water discharging from seeps and springs, and those are the designated postmining users most likely to be impacted. Baseline conditions in the Coal Hollow permit and adjacent area have shown in both scientific literature from USGS field investigations and in the baseline groundwater data collected that TDS concentrations from the upland areas range from 100-500 mg/L while baseline groundwater TDS concentrations in Sink Valley typically range from 500-3,000 mg/L. There are no state-established groundwater quality standards for TDS. If TDS concentrations persistently exceed 3,000 mg/L it will be an indication that evaluation for material damage is needed.

VI. ESTIMATE PROBABLE FUTURE IMPACTS OF MINING ACTIVITY WITH RESPECT TO THE PARAMETERS IDENTIFIED IN V.

GROUND WATER

Dewatering related to mining has the greatest potential for impacting ground-water resources in the CIA.

Dewatering

Large-scale dewatering of the alluvial groundwater system, such that appreciable compaction of the aquifer skeleton could occur, is not anticipated (Section 724.500). Increased rates of dewatering may in the future result in depletion of ground-water storage in some beds above the coal seams. Upon cessation of mining, evaporation and water discharge, if there has been any, will be discontinued. Ground-water conditions similar to those that existed before mining will probably be established.

Estimates of groundwater inflow rates suggest that large, unmanageable amounts of alluvial groundwater will likely not be encountered; however, special mining protocols found in Appendix 7-9 of the MRP will be used when mining east of well C2 (Pits 13, 14, and 15) in order to minimize the potential for interception of large groundwater inflows.

When the pits are backfilled, it is likely that the average hydraulic conductivity of the placed run-of-mine backfill material will be low because of the pervasiveness of low-permeability, clay-rich materials in the overburden and the anisotropic nature of the placed fill material. Consequently, the potential for the migration of appreciable quantities of groundwater through the fill is considered low. In addition, to minimize the potential for long-term impacts to the alluvial groundwater system that could occur from long-term draining of alluvial groundwater into the pit backfill area, a permanent engineered low-permeability barrier will be emplaced adjacent to the undisturbed alluvial sediments along the eastern edge of Pit 15. Information and design details for this low-permeability barrier are in Appendix 7-10 of the Coal Hollow Mine MRP. Mr. Alan O. Taylor of Taylor Geo-Engineering, LLC performed an evaluation of the permanent barrier, and the Taylor Geo-Engineering report indicates that the proposed 50-foot wide barrier will prevent any appreciable drainage of alluvial groundwater from the coarse-grained alluvial groundwater system - centered east of the permit area - into the backfilled pit areas. Laboratory analysis of the Tropic Shale material from which the barrier will be constructed indicates that the compacted shale material will perform adequately to successfully contain the alluvial groundwater. Using this technique, the pit areas will be reclaimed to restore

the approximate pre-existing groundwater levels in Sink Valley and minimize the potential for impacts to subirrigation and soil moisture in the lands upgradient of mining areas.

SURFACE WATER

Changes in flow volume and total dissolved sediments in water quality have the greatest potential for impacting water resources in the CIA. Sites that were used for baseline monitoring of the Coal Hollow Mine are on Drawing 7-2 of the MRP. Sites to be monitored during mine operation are on Drawing 7-10.

Water Quality

Uncontrolled runoff from the disturbed lands and spoil pile could increase sediment concentrations and alter the distribution and concentration of dissolved solids in the receiving streams. Sediment control measures such as sedimentation ponds are to be used to protect receiving streams from impacts from the mine's disturbed areas.

Kanab Creek, Lower Robinson Creek, and Sink Valley Wash are monitored above and below the proposed Coal Hollow Mine, and monitoring will continue through mining and reclamation. Discharges from sedimentation ponds will be monitored under the Coal Hollow Mine's UPDES permit. There is no plan to discharge water directly from the Coal Hollow Mine, but should the need arise, ACD has made a commitment to obtain a UPDES permit (MRP Section 724.200).

Based on analyses for the acid- and toxic-forming potential of the overburden and Smirl Coal Seam at the Coal Hollow Mine permit area (Appendices 6-1 and 6-2)x 6-2), it is apparent that acid-forming and toxic-forming materials that could result in the contamination of surface-water or groundwater supplies in the Coal Hollow Mine permit and adjacent area are generally not present. Both groundwaters and earth materials are moderately alkaline.

CIA Sediment Control

Four sedimentation ponds and associated diversion ditches will be the primary sediment control method at the Coal Hollow Mine. Miscellaneous controls such as silt fence, straw bales, and berms are also proposed during construction and for specific areas, such as where impoundments or diversions are not suitable to the surrounding terrain.

Water Quantity

Discharges from sedimentation ponds will be monitored under Coal Hollow Mine's UPDES permit. There is no plan to discharge water directly from the mine, but should the need arise, ACD has made a commitment to obtain a UPDES permit (MRP Section 724.200).

STATEMENT OF FINDINGS

Estimates of groundwater inflow rates suggest that large, unmanageable amounts of alluvial groundwater will likely not be encountered; however, special mining protocols found in Appendix 7-9 of the MRP will be used when mining east of well C2 (Pits 13, 14, and 15) in order to minimize the potential for interception of large groundwater inflows.

When the pits are backfilled, it is likely that the average hydraulic conductivity of the placed run-of-mine backfill material will be low because of the pervasiveness of low-permeability, clay-rich materials in the mine overburden and the anisotropic nature of the placed fill material. Consequently, the potential for the migration of appreciable quantities of groundwater through the fill is considered low. In addition, to minimize the potential for long-term impacts to the alluvial groundwater system that could occur from long-term draining of alluvial groundwater into the pit backfill area, a permanent, engineered low-permeability barrier will be emplaced adjacent to the undisturbed alluvial sediments along the eastern edge of the pit 15. Information and design details for this low-permeability barrier are in Appendix 7-10 of the Coal Hollow Mine MRP. Mr. Alan O. Taylor of Taylor Geo-Engineering, LLC performed an evaluation of the permanent barrier, and the Taylor Geo-Engineering report indicates that the proposed 50-foot wide barrier will prevent any appreciable drainage of alluvial groundwater from the coarse-grained alluvial groundwater system centered east of the permit area into the backfilled pit areas. Laboratory analysis of the Tropic Shale material from which the barrier will be constructed indicates that the compacted shale material will perform adequately to successfully contain the alluvial groundwater. Using this technique, the pit areas will be reclaimed to restore the approximate pre-existing groundwater levels in Sink Valley and minimize the potential for impacts to subirrigation and soil moisture in the lands upgradient of mining areas.

The clays, claystones, silts, siltstones, and shales that dominate the overburden have low hydraulic conductivity and consequently groundwater seepage through backfill in reclaimed mine pits and excess spoils storage areas will not be large.

VII. ASSESS PROBABLE MATERIAL DAMAGE

FIVE-YEAR PERMIT TERM

Coal Hollow Mine

Planned operational monitoring will document any measurable changes in the surface- and ground-water systems. Surface disturbances and UPDES permitted discharges are not expected to degrade surface- or ground-water quality. There is no AVF in the Coal Hollow Mine permit area or adjacent area to be impacted. Sediment control measures should continue to effectively prevent diminution of water quality in the receiving drainages.

The operations plan for the Coal Hollow Mine indicates that the operator should be able to control water inflow.

BLM LBA area

The Division will need to do further evaluation of areas along Kanab Creek for the presence of AVFs and potential impacts from mining before a mining permit can be issued for the future LBA area. The Division will also update the CHIA based on the findings of that determination.

FUTURE MINING

If it is demonstrated that mining has caused or will cause a diminution, contamination, or interruption of an appropriated water right or a material impact either within or outside of the permit area, ACD will be required by the Division to address means of minimizing the impact and replacing any appropriated water rights. Evaluation of Coal Hollow Mine PHC and the preparation of this CHIA do not indicate that there is any evidence that such impacts will result from the proposed mining in the Alton/Sink Valley CIA, and as a consequence, there is no reason to require operators to propose alternatives for disposing of the displaced water or other possible actions as part of the PAP.

Increased rates of dewatering may in the future result in depletion of ground-water storage in some beds above the coal seams. Upon cessation of mining, mine water discharge, if there has been any, will be discontinued. Ground-water conditions similar to those that existed before mining will probably be established as the mine workings flood.

Drainage from surface disturbance due to coal mining and reclamation operations will be managed through appropriate sediment controls. Excess spoil areas will be adequately covered with topsoil and all disturbed areas will be stabilized and revegetated to prevent surface water contamination.

STATEMENT OF FINDINGS

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 in of the Coal Hollow Mine have been designed to prevent material damage to the hydrologic balance outside the permit area. The Division has found no probability of material damage to the hydrologic balance from all anticipated mining operations in the CIA.

O:\025005.COL\CHIA\CHIACoal Hollow.doc

VIII. REFERENCES

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- Doelling, H. H. 1972, Central Utah Coal Fields: Sevier-Sanpete, Wasatch Plateau, Book Cliffs and Kane: Utah Geological and Mineral Survey, Monograph Series. No. 3.
- Hadley, Michael J. and Ottenbacher, Michael J, 2007, Kanab Creek, Paria River, Kaiparowitz Plateau Drainage Management Plan, Utah Dept. Wildlife Resources, Publication # 08-001.
- Long Resource Consultants, January 2008, Order 2 Soil Survey.
- Lines, G. C. and Plantz, G. C., 1981, Hydrologic Monitoring of the Coal Fields of Central Utah, August 1978 - September 1979, USGS Water-Resources Investigations Open-File Report 81-138, 56 p.
- National Climatic Data Center, Palmer Drought Index from September 2008 to August 2009: URL: <http://www.ncdc.noaa.gov/oa/climate/research/prelim/drought/pdiimage.html>
- Office of Surface Mining - US Department of the Interior, Code of Federal Regulations, Title 30--Mineral Resources
- Office of Surface Mining - US Department of the Interior, 1983, Alluvial Valley Floor Identification and Study Guidelines.
- Petersen Hydrologic LLC, 2009, Supplemental Information for Utah Division of Oil, Gas and mining, Alluvial Valley Floor Finding for the Proposed Coal Hollow Mine.
- Petersen Hydrologic LLC, 2007, Investigation of Groundwater and Surface-Water Systems in the 630-Acre Proposed Coal Hollow Mine Permit and Adjacent Area; Probable Hydrologic Consequences of Coal Mining; Recommended Monitoring Plan; Potential Alluvial Valley Floor Information; Kane County, Utah.
- Price, D. and Plantz, G. G., 1987, Hydrologic Monitoring of Selected Streams in Coal Fields of Central and Southern Utah--summary of data collected, August 1978-September 1984: USGS Water Resources Investigations Report 86-4017, 102 p.

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- Utah Department of Natural Resources, Division of Water Rights, 1981, Groundwater Conditions in the Upper Virgin River and Kanab Creek Basins Area, Utah, Technical Publication No. 70.
- Utah Division of Water Resources, 1993, Utah State Water Plan – Kanab Creek/Virgin River Basin.
- UDWQ, Utah Department of Water Quality, 2009, Standards for Quality for Waters of the State - R317-2 UAC, Utah Department of Environmental Quality.
- USGS, 1985, Hydrologic Reconnaissance of the Kolob, Alton and Kaiparowits Plateau Coal Fields, South-Central Utah, G.G. Plantz.
- Water Encyclopedia URL: <http://www.waterencyclopedia.com/>

ACRONYMS

ABBREVIATIONS

AML	Abandoned Mine Lands
AVF	Alluvial Valley Floor
BLM	Bureau of Land Management
CIA	Cumulative Impact Area
CHIA	Cumulative Hydrologic Impact Area
CVSSD	Castle Valley Special Service District
DWR	Utah Division of Wildlife Resources
EA	Environmental Assessment
NEWUSSD	North Kane Water Users Special Service District
MRP	Mining and Reclamation Plan
MSHA	Mine Safety and Health Administration
PAP	Permit Application Package
PHC	Probable Hydrologic Consequences
PHDI	Palmer Hydrologic Drought Index
SMCRA	Surface Mining Control and Reclamation Act of 1977
UDOGM	Utah Division of Oil, Gas and Mining
UDWR	Utah Division of Water Resources
UDWQ	Utah Division of Water Quality
UPDES	Utah Pollution Discharge Elimination System
UP&L	Utah Power and Light
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

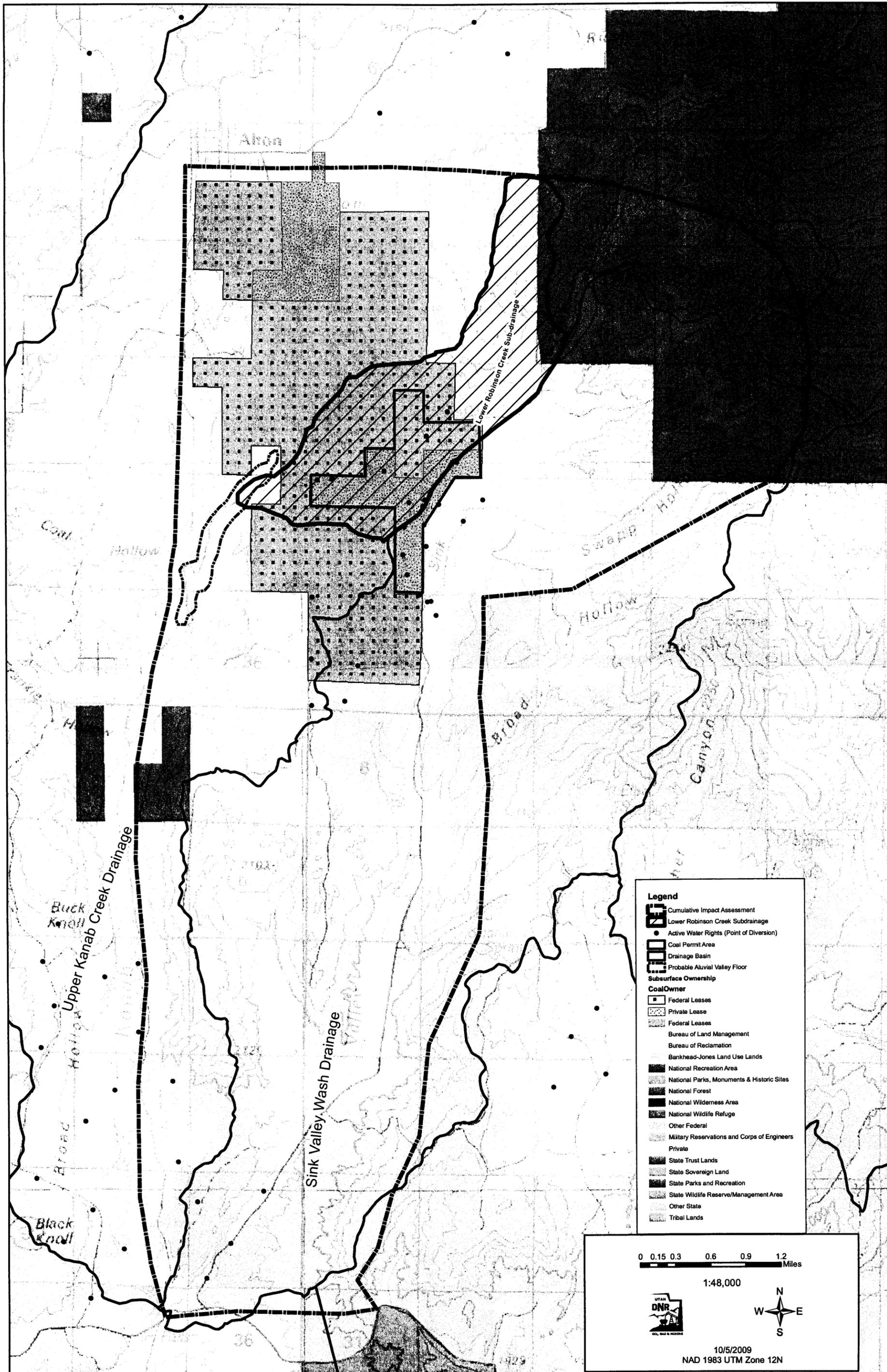
APPENDIX A

APPENDIX A

PLATES

- Plate 1** CIA Boundary and Coal Hollow Permit Area with Federal Leases
- Plate 2** Infrared Aerial Photography Map
- Plate 3** Aerial Photography Map

Proposed Alton Coal Permit Area



Legend

- Cumulative Impact Assessment
- Lower Robinson Creek Subdrainage
- Active Water Rights (Point of Diversion)
- Coal Permit Area
- Drainage Basin
- Probable Alluvial Valley Floor
- Subsurface Ownership
- Coal Owner**
 - Federal Leases
 - Private Lease
 - Federal Leases
 - Bureau of Land Management
 - Bureau of Reclamation
 - Bankhead-Jones Land Use Lands
 - National Recreation Area
 - National Parks, Monuments & Historic Sites
 - National Forest
 - National Wilderness Area
 - National Wildlife Refuge
 - Other Federal
 - Military Reservations and Corps of Engineers
 - Private
 - State Trust Lands
 - State Sovereign Land
 - State Parks and Recreation
 - State Wildlife Reserve/Management Area
 - Other State
 - Tribal Lands

0 0.15 0.3 0.6 0.9 1.2 Miles

1:48,000

10/5/2009
NAD 1983 UTM Zone 12N

Proposed Alton Coal Permit Area



Proposed Alton Coal Permit Area



Upper Kanab Creek Drainage

Sink Valley Wash Drainage

Lower Robinson Creek Sub-drainage

Legend

- Cumulative Impact Assessment
- Lower Robinson Creek Subdrainage
- Active Water Rights (Point of Diversion)
- Coal Permit Area
- Drainage Basin
- Probable Alluvial Valley Floor
- Subsurface Ownership

Coal Owner

- Federal Leases
- Private Lease

0 0.15 0.3 0.6 0.9 1.2 Miles

1:48,000



10/5/2009
NAD 1983 UTM Zone 12N



JON M. HUNTSMAN, JR.
Governor

GARY R. HERBERT
Lieutenant Governor

State of Utah

DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER
Executive Director

Division of Oil, Gas and Mining

JOHN R. BAZA
Division Director

October 15, 2009

TO: Internal File

FROM: Daron R. Haddock, Permit Supervisor 

RE: 510 (c) Recommendation for Alton Coal Development, LLC, Coal Hollow Mine, C/025/0005

As of this writing of this memo, there are no NOV's or CO's which are not corrected or in the process of being corrected. There are no finalized civil penalties, which are outstanding and overdue in the name of Alton Coal Development, LLC. Alton Coal Development, LLC does not demonstrate a pattern of willful violations, nor have they been subject to any bond forfeitures for any operation in the state of Utah.

Attached is the findings evaluation from the Applicant Violator System (AVS), dated October 15, 2009.

Attachment
O:\025005.COL\FINAL\PERMIT\2009\510C.DOC



Entity Evaluation

Entity Number 247248
Entity Name Alton Coal Development LLC
Date of Evaluation 10/15/2009 9:05:29 AM
Requested Individual suzanne.steab

CAUTION: The Applicant/Violator System (AVS) is an informational database. Permit eligibility determinations are made by the regulatory authority with jurisdiction over the permit application not by the AVS. Results which display outstanding violations may not include critical information about settlements or other conditions that affect permit eligibility. Consult the AVS Office at 800-643-9748 for verification of information prior to making decisions on these results.

There were no violations retrieved by the system

Evaluation OFT

Entities: 7

- 247248 Alton Coal Development LLC - ()
- 036531 Robert C Nead Jr - (Shareholder)
- 092013 Stonie Barker Jr - (Shareholder)
- 247281 Chris R. McCourt - (Manager)
- 247281 Chris R. McCourt - (Shareholder)
- 247290 James J Wayland - (Shareholder)
- 249664 Alexander D. Mirrow - (Member)
- 249665 Anthony P. Gargiulo - (Member)

Narrative

Affidavit of Publication

STATE OF UTAH)
(SS.
COUNTY OF KANE)

COPY OF NOTICE

I, Dennis A. Brunner, being duly sworn, depose and say that I am General Manager of the SOUTHERN UTAH NEWS, a weekly newspaper of general circulation for Kane County, Utah and Coconino County, Arizona, and published every Wednesday at Kanab, Utah, and the notice attached hereto,

was published in said newspaper for: **FOUR**
consecutive weeks, the first publication on: **3/26/08**
and the last on: **4/16/08**

that said notice was published in the regular and entire issue of every number of the paper during the period and times of publication, and that the same was published in the newspaper proper and not in a supplement.

2008

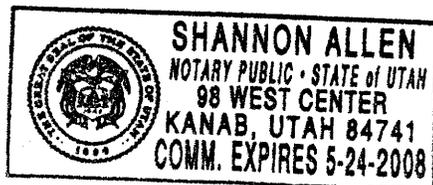
Dennis Brunner

Subscribed and sworn to before me April 30, 2008

Shannon Allen, Notary Public

Residing in Kanab, Utah.

My commission expires: 5-24-08



**Legal Notice
Public Notice for
Permit Application**

Notice is hereby given that Alton Coal Development, LLC is applying for a permit to conduct mining operations at the Coal Hollow Mine in Kane County, South Central Utah. The business address for Alton Coal Development is:

Alton Coal Development, LLC
463 North 100 West, Suite 1
Cedar City, UT 84720

Alton Coal Development has filed with the Utah Division of Oil, Gas & Mining a Mining and Reclamation Plan (MRP) application number C/025/0005. This Application has been filed for the Coal Hollow Mine, a surface coal mining operation. The Coal Hollow Mine is located approximately 35 miles north of Kanab, Utah (the Kane County seat) and approximately 4 miles south of the town of Alton, Utah.

Project Area Legal Description

All certain real property situated in Township 39 South, Range 5 West, SLB&M, Kane County, Utah, more particularly described as follows:

DESCRIPTION: TOWNSHIP 39 SOUTH-RANGE 05 WEST, SLB&M Section 30: All of Section Lot #1 (NW1/4 NW 1/4); NE1/4 NW1/4; N1/2 NE1/4;

ALSO: BEGINNING 3.50 chains West of the East Quarter corner of Said Section 30, and running South 34° 34' West 22.64 chains to the 1/16 section line; thence West 2.64 chains to the Southwest corner of NE1/4 SE1/4 of Said Section 30; thence North 40.00 chains; thence East 20.00 chains; thence South 14.69 chains; thence southwesterly to the point of beginning...containing 217.64 acres, more or less.

DESCRIPTION: TOWNSHIP 39 SOUTH-RANGE 05 WEST, SLB&M Section 30: BEGINNING at a point 5.31 chains North of the E1/4 corner of Said Section 30, and running thence South 45.31 chains; thence West 20.00 chains; thence North 20.00 chains; thence East 2.64 chains; thence North 34° 34' East 22.64 chains to the 1/16 section line; thence North 33° 22' East to the point of beginning...containing 61.96 acres, more or less.

DESCRIPTION: TOWNSHIP 39 SOUTH-RANGE 05 WEST, SLB&M Section 29: BEGINNING at the Northwest corner of Said Section 29, and running thence South 34.69 chains; thence North 33° 22' East 35.50 chains; thence North 40° West 0.58 chains; thence North 37° 30' East 12.30 chains; thence West 22.23 chains to the point of beginning...containing 36.04 acres, more or less.

DESCRIPTION: TOWNSHIP 39 SOUTH-RANGE 05 WEST, SLB&M Section 19: SW1/4SE1/4, E1/2SE1/4, SE1/4NE1/4...containing 160.0 acres, more or less

DESCRIPTION: TOWNSHIP 39 SOUTH-RANGE 05 WEST, SLB&M Section 20: SW1/4...containing 160.0 acres, more or less County Road 136 currently intersects the Coal Hollow

Mine Project Area. Approximately two miles of this road will be temporarily relocated to allow for mining operations. This relocated section begins approximately three miles south of the Town of Alton and will reconnect with the original road approximately five miles south of the Town. This relocation will occur in year one of mining operations and is expected to be reestablished to the approximate original location in a time frame ranging from year four to year five of the mining operation.

The permit application area is located on the Alton, Utah, U.S. Geological Survey 7.5 minute quadrangle map. The application was filed and this notice is prepared and published to comply with the Surface Mining Control and Reclamation Act of 1977 and State and Federal regulations promulgated pursuant to said act.

A copy of Alton Coal Development's permit application will be filed for public inspection at:

Kane County Recorder Office
76 North Main
Kanab, Utah 84741; and

The State of Utah
Department of Natural Resources
Division of Oil, Gas & Mining
1549 West Temple, Suite 1210
Salt Lake City, Utah 84116

Written comments, objections or requests for informal conferences on the application may be submitted to the Division of Oil, Gas and Mining at the following mailing address:

Department of Natural Resources
Division of Oil, Gas & Mining
P.O. Box 145801
Salt Lake City, UT 84114-5801

See map on right

Published in the *Southern Utah News* on March 26, April 2, 9 & 16, 2008. Written comments or objections must be submitted within 30 days following the final publication of this advertisement.

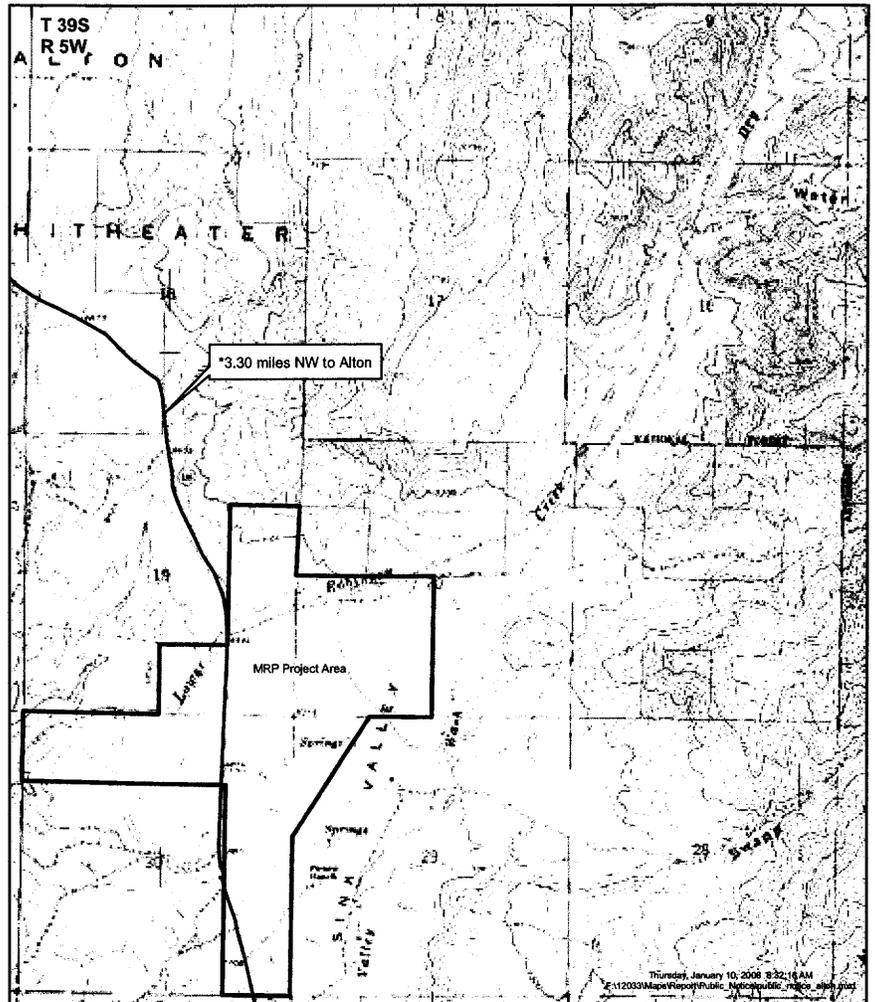
NOTICE TO WATER USERS

The State Engineer received the following Application(s) in Kane County (Locations in SLB&M).

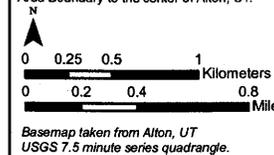
For more information or to receive a copy of filings, visit <http://waterrights.utah.gov> or call 1-866-882-4426.

Persons objecting to an application must file a CLEARLY READABLE protest stating FILING NUMBER, REASONS FOR OBJECTION, PROTESTANTS' NAME AND RETURN ADDRESS, and any request for a hearing. Protest must be filed with the State Engineer, Box 146300, Salt Lake City, UT 84114-6300 on or before APRIL 22, 2008.

These are informal proceedings as per Rule R655-6-2 of the Division of Water Rights. (The Period of Use is generally year-round except irrigation

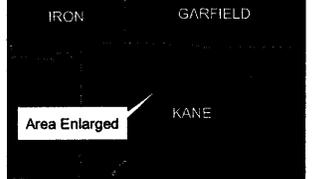


*Approximate distance from the MRP Project Area Boundary to the center of Alton, UT.



Basemap taken from Alton, UT USGS 7.5 minute series quadrangle.

- County Road 136
- MRP Project Area
- Bureau of Land Management
- Private
- US Forest Service



which is generally from Apr 1 to Oct 31 each year.)

CHANGE APPLICATION(S) 81-4713(a34159): Zion Mountain Land Holdings, LLC propose(s) using 39.999 ac-ft. from groundwater (7 miles NW of Mt. Carmel Juntn) for IRRIGATION.

Jerry D. Olds, P.E.
STATE ENGINEER

Published in the *Southern Utah News* on MARCH 26 & APRIL 2, 2008.

**LEGAL NOTICE
NOTICE OF LIEN SALE**

40' Gooseneck Superior Trailer

Vessel located at:
475 Independence
Big Water, UT 84741

Owner in default:
Bryan Edlund
134 W. 8th
Leadville, CO 80461

Sale to be held on April 12, 2008 at 8:00 a.m. MDT at 475 Independence, Big Water, UT 84741

Published in the *Southern Utah News* on March 26 and April 2, 2008.

PUBLIC NOTICE

Petition for annexation have been filed in the office of the Kanab City Recorder for the purpose of requesting annexation of parcels of land belonging to WSC Partners LLC located at approximately NW 1/4 & SN1/4 of Section 4, T44S, R6 W S.L. B. M., more specifically described as follows: BEGINNING AT THE WEST QUARTER CORNER OF SECTION 4, TOWNSHIP 44 SOUTH, RANGE 6 WEST, OF THE SALT LAKE BASE AND MERIDIAN; THENCE N00°32'54"E, ALONG THE SECTION LINE AND ALONG THE EAST LINE OF THE KANAB CREEK RANCHOS SUBDIVISION, (UNITS 4,6, AND 7)

See LEGALS, Page 19

**The deadline for legal advertising
is Friday at 1p.m.**

Affidavit of Publication

STATE OF UTAH)
(SS.
COUNTY OF KANE)

COPY OF NOTICE

I, Dennis A. Brunner, being duly sworn, depose and say that I am General Manager of the SOUTHERN UTAH NEWS, a weekly newspaper of general circulation for Kane County, Utah and Coconino County, Arizona, and published every Wednesday at Kanab, Utah, and the notice attached hereto,

was published in said newspaper for: **ONE**
consecutive weeks, the first publication on: **3/25/09**
and the last on: **3/25/09**

that said notice was published in the regular and entire issue of every number of the paper during the period and times of publication, and that the same was published in the newspaper proper and not in a supplement.

Dennis Brunner

Subscribed and sworn to before me 3-27-09

Shado Colson, Notary Public

Residing in Kanab, Utah.

My commission expires: 10-30-2011



PUBLIC NOTICE

**BEFORE THE DIVISION OF OIL,
GAS AND MINING DEPARTMENT
OF NATURAL RESOURCES STATE
OF UTAH**

**IN THE MATTER OF ALTON COAL
DEVELOPMENT LLC, COAL
HOLLOW MINE, KANE COUNTY,
UTAH**

**NOTICE OF ROAD RELOCATION
AND TEMPORARY CLOSURE**

**THE STATE OF UTAH TO ALL PER-
SONS INTERESTED IN THE ABOVE
ENTITLED MATTER.**

Notice is hereby given that the Division of Oil, Gas and Mining (Division) is taking public comment and providing an opportunity for a public hearing on the temporary relocation of the Sink Valley Road (Kane County Road K3900) and the temporary closure of the Robinson Creek Road (K3993) as proposed by Alton Coal Development, LLC., in the Coal Hollow Mine application. County Road K3993 will be closed for the 'life of mine.' Approximately 2 miles of Road K3900 will be temporarily relocated for the 'life of mine,' beginning about 2 miles south of the Town of Alton. (See map on right). Information on the road relocation can be accessed on the internet following the instructions given at <https://fs.ogm.utah.gov/COALFILES.html> and linking to: C0250005/2008/IN-COMING/12182008. Angela Nance, (801) 538-5264 or Suzanne Steab, (801) 538-5265, can be contacted if assistance is needed to access these files.

This opportunity for public hearing is in accordance with the Utah Code Ann. 8 40-10-24(4) (1953, as amended), Utah Admin. R645-103-234, and Informal Conference Findings and Order Cause No. C/025/005 dated July 18, 2008.

Public comments and request for a public hearing on the road relocation and temporary closure may be submitted to the Division of Oil, Gas and Mining at the following address: Division of Oil, Gas & Mining, Coal Regulatory Program, P.O. Box 145801, Salt Lake City, Utah 84114-5801. Written comments or requests for public hearing must be submitted within 30 days following the publication of the advertisement.

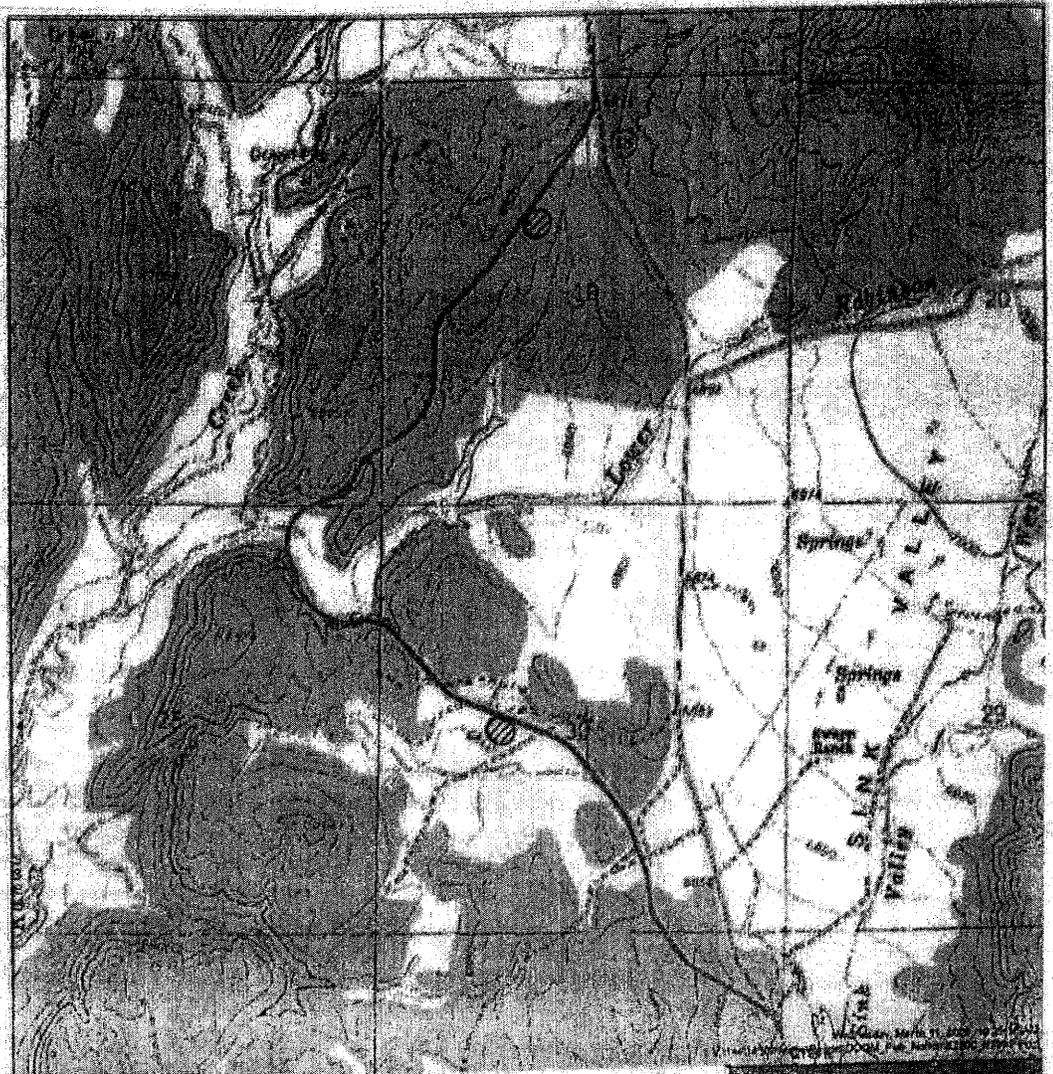
STATE OF UTAH DIVISION OF
OIL, GAS AND MINING

State of Utah

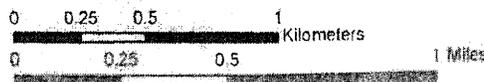
Published in the *Southern Utah News*
on March 25, 2009.

2.5 Miles

**The deadline for
legal advertising
is Friday at 1 p.m.**



- K3900 Realignment
- ROW
- TUA
- Cut/Fill Slope Area
- K3900 Current Alignment
- K3993 - Kane County





CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
10/15/2009

PRODUCER (435) 637-7803 FAX: (435) 637-7811
James Banasky Insurance Inc.
 6 West Main Street
 PO Box 728
 Price UT 84501
INSURED
 Alton Coal Development, LLC
 463 N 100 W STE 1
 Cedar City UT 84721

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURERS AFFORDING COVERAGE		NAIC #
INSURER A:	CHUBB Insurance	
INSURER B:	American Liberty	
INSURER C:		
INSURER D:		
INSURER E:		

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR ADD'L LTR INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YYYY)	POLICY EXPIRATION DATE (MM/DD/YYYY)	LIMITS
A	GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY CLAIMS MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC	SS86-33-72 DAL	5/19/2009	5/19/2010	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 1,000,000 MED EXP (Any one person) \$ 10,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 1,000,000
A	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS HIRED AUTOS NON-OWNED AUTOS	(09) 7354-18-34	5/19/2009	5/19/2010	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$
	GARAGE LIABILITY ANY AUTO				AUTO ONLY - EA ACCIDENT \$ OTHER THAN EA ACC \$ AUTO ONLY: AGG \$
	EXCESS / UMBRELLA LIABILITY <input type="checkbox"/> OCCUR <input type="checkbox"/> CLAIMS MADE DEDUCTIBLE \$ RETENTION \$				EACH OCCURRENCE \$ AGGREGATE \$ \$ \$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under SPECIAL PROVISIONS below	WC10623509	2/13/2009	2/13/2010	WC STATU-TORY LIMITS <input checked="" type="checkbox"/> OTH-ER \$ E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000
	OTHER				

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS

CERTIFICATE HOLDER

(801) 359-3940
 Utah Division of Oil, Gas and Mining
 P.O. Box 145801
 Salt Lake City, UT 84114

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ~~MAIL~~ **MAIL** 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, ~~BY FIRST CLASS MAIL~~ **BY FIRST CLASS MAIL** ~~OR BY REGISTERED MAIL~~ **OR BY REGISTERED MAIL** ~~OR BY CERTIFIED MAIL~~ **OR BY CERTIFIED MAIL** ~~OR BY ANY OTHER MEANS~~ **OR BY ANY OTHER MEANS** ~~WHICH PROVIDES PROOF OF DELIVERY~~ **WHICH PROVIDES PROOF OF DELIVERY**

AUTHORIZED REPRESENTATIVE *[Signature]*