

# TECHNICAL MEMORANDUM

## Utah Coal Regulatory Program

December 27, 2005

TO: Internal File

THRU: Wayne Hedberg, Permit Supervisor, Task Manager

FROM: Peter H. Hess, Environmental Scientist III/Engineering, Team Lead

RE: 2005 Midterm Review, Canyon Fuel Company, LLC., Dugout Canyon, C/007/039, Task ID #2348

### **SUMMARY:**

The Division initiated a mid-term review of the Canyon Fuel Company Dugout Canyon Mine mining and reclamation plan on October 13, 2005 by informing the Permittee of the process required under R645-303-211. Seven areas of the MRP have been selected by the Division as part of the evaluation process; these include the following:

- 1) A review to ensure that the Plan has been updated to reflect changes in the Utah Coal Regulatory Program, which have occurred subsequent to permit approval. This includes compliance with the USFWS Windy Gap Process, which is an evaluation of water usage by the mining operation, and its potential effect on four T&E fish species in the Colorado River basin.
- 2) A review of the plan to ensure that all amendments approved by the regulatory agency have been incorporated.
- 3) A review of the amount of reclamation bond necessary to reclaim the disturbed area(s) associated with the mining operation, and that the amount is escalated to the appropriate year dollars.
- 4) A review of the MRP commitments for subsidence control/monitoring plans and reporting requirements.

As part of the mid-term review process, the Division conducted a site visit to the main facilities area and the under construction Pace Canyon fan portal on November 29, 2005.

This memo will address the requirements of the mid-term permit review process as they relate to R645-301-500, Engineering.

The Division has designated this project as Task ID #2348.

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**TECHNICAL ANALYSIS:**

**ENVIRONMENTAL RESOURCE INFORMATION**

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

**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:**

**Existing Structures and Facilities Maps**

Plate 5-2, SURFACE FACILITIES, depicts a plan view of the main mine facilities located in Dugout Canyon. Plate PC5-2 (APPENDIX 5-10, Volume 2, Chapter 5) describes the fan and portal facilities located in Pace Canyon. Both maps were updated during 2005, and both are certified by a Utah registered professional engineer.

Appendix 7-9, WATER WELL PAD, contains FIGURE 7-9-1, which depicts a plan view of the Gilson water well area. This is located up-Canyon from the main Mine facilities area, along a road that will remain post-mining. This drawing is also certified by a Utah registered professional engineer.

**Existing Surface Configuration Maps**

Plate 5-4, EXISTING SURFACE TOPOGRAPHY, shows the surface topography of the area in which the Dugout Mine surface facilities was developed as it existed post-mining / pre-SMCRA. When mines were initially developed in this Canyon, there were no requirements in place to make a Permittee obtain existing surface configuration maps. Therefore, Plate 5-4 is accepted as the surface configuration of the area even before the first mines were developed. Plate 5-4 is P.E. certified by a Utah professional engineer.

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Plate PC5-4, Pace Canyon Existing Surface Topography, depicts the surface configuration in the area, which had been previously disturbed by mining although the disturbance occurred pre-SMCRA. The Plate also shows the location of two coal mine waste storage locations which were created during coal extraction activities at the Snow Mine (1940's). This Plate is P.E. certified by a Utah registered professional engineer.

### **Mine Workings Maps**

Mine workings are depicted as “*2004 Production RC*” (Rock Canyon seam) and “*2004 Production GIL*” (Gilson seam) and are submitted as part of the 2004 Annual Report. These maps clearly identify where coal has been extracted during the 2004 production year. “*2004 Production GIL*” also shows outlines for the old mine workings (pre-SMCRA) in the Rock Canyon and Gilson seams, as well as an outline for the old Snow Mine workings. “*2004 Production RC*” depicts the outline of the old mine workings in the Rock Canyon seam. Both maps are P.E. certified by Mr. Dave Spillman, Utah registered professional engineer.

Plate 5-1, PREVIOUSLY MINED AREAS, shows the old mine workings in both the Rock Canyon seam and the Gilson seam as they once existed adjacent to and beneath Dugout Canyon. This map is P.E. certified by Richard B. White, Utah registered professional engineer (September 1998 certification).

### **Permit Area Boundary Maps**

PLATE 1-4, DUGOUT CANYON MINE PERMIT AREA, depicts the permit boundary where authorized coal extraction activities are permitted under C/007/039. PLATE 1-4 shows the location of the disturbed areas for the main mine facilities, the waste rock disposal area, and the Pace Canyon fan portal area. The locations of degasification wells G-1, G-2, G-3, G-4, G-5, G-6, G-7, G-8, G-9, and G-10 are depicted. This plate was incorporated into the MRP in September of 2005, and same is P.E. certified by a Utah registered professional engineer.

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

Plate 1-1, SURFACE OWNERSHIP, Dugout Canyon Mine, which currently exists within the mining and reclamation plan was last updated and incorporated on or about June 24, 2005. This map is P.E. certified by a Utah registered professional engineer.

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Plate 1-2, COAL OWNERSHIP, Dugout Canyon Mine, was last updated / incorporated on or about June 24, 2005, with the addition and approval of 2,560 acres of coal owned and managed by the State of Utah, School and Institutional Trust Lands Administration (See Task ID# 2181, approval date June 24, 2005). This map is P.E. certified by Mr. David G. Spillman, Utah registered professional engineer, and Manager of Technical Services for the Permittee.

### **Findings:**

This section meets the minimum requirements of the R645 Coal Mining Rules.

## **OPERATION PLAN**

### **MINING OPERATIONS AND FACILITIES**

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

### **Analysis:**

Due to concerns aired by the U.S. Department of Labor, Mine Safety and Health Administration relative to the underground ventilation system at the Dugout Canyon Mine, the Permittee found it necessary to design and permit an additional ventilation fan installation in Pace Canyon. The initial application was received in January of 2004. Final approval to proceed with the construction activities was received on May 20, 2005 (Task ID #2193).

The Pace Canyon fan portal installation includes a drift opening from the Gilson coal seam to the surface, as well as a vertical airshaft, which intercepts the return air courses of the Dugout Canyon Mine. The fan installation includes a diesel engine and twin standby generators for backup power. An escape way established at the intake portal provides egress from the Mine in the event of an emergency.

**APPENDIX 5-10** (Volume 2, Chapter 5 of the MRP) contains a picture of a fan installation that exists at the Soldier Canyon Mine located in Nine Mile Canyon. This picture is very similar to the fan installation at the Pace Canyon facilities, and shows the vertical diffuser that was implemented for noise reduction purposes.

**Plate PC5-2**, Pace Canyon Fan Surface Facilities and Cross-Section Locations, shows the “proposed” features of this surface disturbance and same has been the “blueprint” to construct these facilities.

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As of the date of this document, construction activities continue, but are nearly complete. The Permittee is aware that “as-built” drawings of the surface facilities must be submitted following completion of the construction.

### **Findings:**

The minimum regulatory requirements of this section have been met.

### **EXISTING STRUCTURES:**

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

### **Analysis:**

Section 526.100, Mine Structures and Facilities, (Volume 3, Chapter 5, page 5-32) refers to Section 521.100, which in turn states that two “existing structures” are present within the permit area which were presumably ‘used in connection with or to facilitate coal mining and reclamation operations for which construction began prior to January 21, 1981, (R645-100-200). These are the existing County road and a UP&L power distribution line.’

The description of the location of the existing County road within the permit area is provided in **Section 521.100** of the mining and reclamation plan.

The Pace Canyon road is noted in the 1980 Carbon County Road Maintenance agreement with the BLM. The Pace Canyon road is considered a “public” road until it enters the NE1/4SE1/4 of section 25, T13SR12E. At this point, the road is gated and public access is no longer possible. The gate is located on the extreme NW corner of section 25, thence it crosses onto surface managed by the USDOJ / BLM / SLO. The road continues up through BLM surface, (through the Pace Canyon facility), where it crosses over to Thayne private surface, just past the Pace Canyon fan portal disturbed area.

The Pace Canyon County road has been in existence for many years, and thus, a reference should be made in Section 526.100, Mine Structures and Facilities.

Plates 4-1 and 5-2 depict the location of the existing UP&L distribution line that was improved and activated to provide electrical service to the Mine. The distribution line is owned and maintained by UP&L.

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### Findings:

The plan is deficient in this area. The R645 requirements must be met in accordance with:

**R645-301-526, and 521.100**, the Permittee must modify the statement on Chapter 5, page 5-32 to include a reference to the Pace Canyon County road as a pre-existing structure.

## RELOCATION OR USE OF PUBLIC ROADS

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

### Analysis:

The minimum regulatory requirements of this section have been addressed within the currently approved mining and reclamation plan. The Pace Canyon fan portal disturbance has not changed this approval.

### Findings:

The minimum regulatory requirements of this section have been met.

## AIR POLLUTION CONTROL PLAN

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

### Analysis:

The Permittee has applied for and received a Division of Air Quality approval to permit one diesel engine and two backup generators to supply backup power for the Pace Canyon mine ventilation fan. DAQE-AN1634005-05 was approved by the Utah regulatory agency on October 21, 2005.

### Findings:

The modification to the air quality approval meets the minimum regulatory requirements of R645-301-420.

## **COAL RECOVERY**

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

### **Analysis:**

As part of the approval process for Task ID# 2181, SITLA lease addition (approval date June 24, 2005) it was necessary for the State of Utah, School and Institutional Trust Lands Administration to review and approve a resource recovery and protection plan which is required from the Permittee with subsequent review by the USDOJ / BLM / SLO under contract through SITLA. The SITLA lease addition received DOGM approval on June 24, 2005.

### **Findings:**

The minimum regulatory requirements of this section have been met.

## **SUBSIDENCE CONTROL PLAN**

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

### **Analysis:**

#### **Renewable Resources Survey**

Renewable resource lands within the permit and adjacent areas are shown on Plate 4-1 and are discussed in Section 411 of the M&RP. The surface area where subsidence is predicted is used for livestock grazing and wildlife habitat, with limited timber production on adjacent lands to the east of Dugout Canyon (See Section 411.120). Hydrologic resources in this area are discussed in Chapter 7 of the MRP.

#### **Subsidence Control Plan**

#### Subsidence Control Measures

Subsidence control measures are discussed in Volume 3, Chapter 5, page 5-28 of the approved mining and reclamation plan. As stated in the text, "anticipated" areas of subsidence are depicted on Plate 5-7, PROPOSED MINE SEQUENCE AND PLANNED SUBSIDENCE

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BOUNDARY. The depicted subsidence boundary was determined by using a thirty-degree angle of draw, as required under R645-301-525.542. The text states that the actual angle of draw is anticipated to be less based upon results of mining and subsidence (studies, PHH) in the general area. It is generally accepted that angles of draw in Utah mines vary from 15 to 22 degrees, but can reach 28 degrees in some geologic areas. Therefore, the thirty-degree angle is justified in determining the area of influence where secondary coal extraction can affect surface areas.

Plate 5-7 also depicts areas where the area of potential subsidence impact could actually occur outside of the approved permit area. This is depicted in Section 17, T13S, R13E of State of Utah SITLA lease ML-48435. An area of potential influence is also mentioned relative to Federal lease U7064-027821.

A review of the subsidence monitoring report for 2004 reveals that the entire report consists of a Plate depicting the Gilson seam workings, the locations of the various subsidence monitoring points, and the elevation differences at each monitored point. **There is no discussion included which analyzes the submitted information. Similarly, there is no analysis included relative to the angle of draw study** which was conducted over the area between 1<sup>st</sup> West and West Mains, (secondary coal extraction occurred during 2001 in the Rock Canyon seam). **The Permittee must analyze and submit a determination for the angle of draw for the study in this area, or state where that analysis can be found.**

Also, the Division does not feel that a single angle-of-draw determination can be determined as being adequate throughout a mine's life of operation. Therefore, **the Division requests that the Permittee propose a frequency to determine whether various angles of draw exist within the Mine's permit area.** The collected data can be used to determine the angle of draw that has the most influence within the permit area. This will be useful in predicting affects and areas of impact for future mining.

Plate 5-7 depicts areas where 500-foot barrier pillars are left between longwall panels, as well as areas where the only abutment remaining between the panels consists of the chain pillars left by the development of the gate roads. The Permittee has initiated the leaving of these 500-foot barrier pillars for the purpose of ground control and to minimize sudden energy releases (bounces, or coal bursts) at the longwall face. This has been done to provide an additional measure of protection for CFC underground employees. There is no mention of these 500-foot barriers anywhere in section **525, Subsidence.**

The Permittee needs to provide a discussion relative to the following:

- a) An analysis of the submitted subsidence data, beginning with the 2005 annual subsidence monitoring data.

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- b) An analysis of the angle of draw study depicted on the 2004 annual subsidence plate, or a statement telling the Division where that determination can be found.
- c) The establishment of a frequency to determine whether different angles of draw could exist within the Dugout Canyon Mine permit area for the prediction of future subsidence impacts.
- d) A geotechnical discussion on the design parameters of the gate road chain pillars and their affect (if any) on the subsidence trough between adjacent longwall panels.
- e) A geotechnical discussion on the affects of the gate road chain pillars to the tension/compression zones of the subsidence trough.
- f) A geotechnical discussion on the affect of the 500-foot barrier pillars on the subsidence trough, and the overall affect to the surface caused by these abutments.
- g) A discussion that elaborates on what considerations the mining engineer implements to minimize surface impacts from these abutments throughout the mining area. This should including a discussion relative to longwall panel orientation versus surface features requiring protection, as well as sub-critical, critical, and supercritical panel width considerations.

### Subsidence Monitoring

Subsidence monitoring is discussed in Volume 3, Chapter 5, pages 5-28 through 5-30. The plan discusses the installation methods for the various survey control points located throughout the permit area. The currently approved plan requires one monitoring point per longwall panel. These are monitored once a year, for new areas that have undergone coal extraction. All survey points are checked during this single evaluation. The 2004 field survey for the annual subsidence report was completed by Mr. Bruce T.S. Ware of Ware Surveying and Engineering on August 27, 2004.

The submitted data contains the surface elevation at each monitoring point when the station was installed, as well as the surface elevation at that point when the 2004 annual survey was conducted. Interim elevation changes by year are not reported.

Although one monitoring point per panel is approved by the current plan, there is no justification provided by the Permittee as to why it is felt that continued monitoring of the maximum amount of subsidence is necessary. Monitoring points are generally located inside of the tension/compression zone, but vary in location from these locations, up to and including the center of the longwall face.

The Division feels that the monitoring of the tension / compression zone, and its lengths which parallel the gate roads are of more importance than the continued monitoring of the maximum depth of the subsidence trough. The Division bases this need upon the fact that subsidence impacts are more likely to propagate to the surface in these tension /compression

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areas such that they are visible, and capable of affecting soil resources, surface water flows, or create hazards for wildlife or human beings.

Page 5-29, paragraph four states “subsidence monitoring will be carried out on an annual basis, and will entail direct ground surveys and visual surveys of the permit area. The annual subsidence monument survey conducted of the monument elevations is considered to be the direct ground survey. However, visual surveys of the permit area are probably not being conducted, as no report of same has been received by the Division or submitted within the annual report.

**The Permittee must submit a document describing the visual surveys that have been conducted for each monitoring year, beginning with the 2005 evaluation year.** This document must contain information relative to areas surrounding monitored seeps, springs, streams, or any other surface activities, (as approved on Page 5-29, Chapter 5, paragraph 4, Dugout Canyon Mine MRP). In addition, roads used to access hydrologic monitoring stations will be visually evaluated during monitoring activities. **The Division recommends that road-monitoring locations be permanently established such that a written record evaluating each location can be maintained.** That record will be submitted as part of the annual subsidence monitoring report.

Page 5-30 of the currently approved Mine plan states the following; “in addition to ground surveys, aerial photogrammetric methods will be included in the surveys when the areas become too large to feasibly handle with ground surveys. This method may be added to enhance the ground surveys...”. Visual checks for subsidence will be made during all surface activities, especially during water monitoring activities.”

Surface lands above the Dugout Canyon Mine are generally covered with vegetation and soils, compared to the SUFCO Mine. At SUFCO, surface cracks are easily visible as the Castlegate sandstone is exposed at the surface. Any cracks that are visible at the Dugout Mine are going to have to be very wide, or have a great deal of displacement. Therefore, **the Permittee needs to design a method to monitor subsidence cracks in the tension/compression zone that parallels the gate road entries outlining consecutively mined longwall panels. This must include a method of establishing the location of the tension zone, the method of observation, the method of recording, and the method of reporting significant cracks to the Division.** The Division feels that a significant crack is one in which soil resources could be lost, surface flows could be impacted, or persons or wildlife could be injured.

### **Notification**

Plate 5-7 depicts the “PROPOSED” MINE SEQUENCE AND PLANNED SUBSIDENCE BOUNDARY that shows the anticipated dates when development and secondary coal extraction will occur in specific areas of the coal reserve through 2008. Surface topography of the permit area is also depicted, as are coal leases.

The Permittee should consider submitting the mining projection map **with appropriate surface ownership delineations** to ensure that surface landowners are notified at least six months prior to the Permittee crossing into the reserve beneath their land in accordance with the requirements of R645-301-525.700. The preparation of this map will make it easier for the Permittee to make the required notifications, and prevent possible compliance actions.

### **Findings:**

The current subsidence control plan is inadequate. In accordance with the requirements of **R645-301-525**, the Permittee must submit the following:

- 1) The Permittee must analyze and submit a determination for the angle of draw study depicted on Plate 5-7, PROPOSED MINE SEQUENCE AND PLANNED SUBSIDENCE BOUNDARY.
- 2) There is no discussion of the engineering design of the chain pillars used to develop the gate road entries of the Dugout Canyon Mines longwall panels. Are these to be yielding pillars, or non-yielding pillars? The Permittee needs to submit a geotechnical discussion on the design parameters of these pillars and their affect on the subsidence trough between adjacent longwall panels, including what affects may occur in the tension / compression zone paralleling the gate roads.
- 3) The Permittee has implemented 500-foot barrier pillars between longwall panels to improve ground control and minimize coal bursts at the longwall face. The Permittee needs to submit a geotechnical discussion on the affect of these barriers on the subsidence trough, and the overall affect to the surface caused by these abutments. This discussion should evaluate critical panel width considerations, as well as other considerations that the mining engineer implements to minimize surface impacts from these abutments throughout the mining area.

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- 4) The currently approved plan allows for one subsidence monitoring point per longwall panel. The Permittee needs to submit justification as to why it is felt that the continued monitoring of the maximum depth of the subsidence trough is necessary.
- 5) The approved plan states on Page 5-29 that visual surveys of the permit area are to be conducted on an annual basis. However, no documentation of these visual surveys has ever been submitted with the annual report. Therefore, the Division concludes that these surveys are not being conducted in accordance with the approved plan. **The Permittee must submit a written document describing the visual surveys that have been conducted for each monitoring year, beginning with the 2005 evaluation year. In addition, roads used to access hydrologic monitoring stations will be visually evaluated during monitoring activities. Documentation of these visual road evaluations must be submitted.** The Division recommends that road-monitoring locations be established such that the same location can be monitored over time, or until moved to the road surface over the adjacent panel.
- 6) The Permittee must justify why it is felt that continued monitoring of the maximum amount of subsidence within a subsidence trough is necessary.
- 7) The Permittee needs to design a method to monitor subsidence cracks in the tension /compression zone that parallels the gate road entries outlining consecutively mined longwall panels. This must include a method of establishing the location of the tension zone, the method of observation, the method of recording, and the method of reporting significant cracks to the Division.
- 8) The Permittee must submit documents describing the visual surveys that have been conducted for each monitoring year, beginning with the 2005 evaluation year. These documented visual surveys must be submitted as part of the annual subsidence monitoring report.
- 9) In accordance with **R645-301-525.700**, the Permittee must submit a revised Plate 5-7, which will depict the proposed mine sequence and planned subsidence boundary, as well as in place coal leases, and surface ownership delineations. This map is necessary to ensure that all surface owners receive the required six-month notice in advance of mining as required under the aforementioned R645 coal rule. This Plate must be resubmitted whenever a planned sequence change is made by the Permittee to the underground workings for whatever reason.

## FISH AND WILDLIFE INFORMATION

**Analysis:**

**Protection and Enhancement Plan**

As part of the midterm permit review process, the Division has evaluated the mining and reclamation plan to ensure that it reflects changes in the Utah Coal Regulatory Program. This includes an evaluation of compliance with the U. S. Fish and Wildlife Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin.

The Permittee provided all equations and values leading to the overall sum of water depletions or contributions for all mining operations. The current value of water contributed (335 acre-ft) to the Colorado River System is greater than the total value of water consumed (147 acre-ft) from mining operations. The overall water balance for the Dugout Canyon Mine is a net gain of 188 acre-feet as of December 2005. The Division, therefore, will not informally consult with the USFWS.

The Division is currently developing a new set of criteria for this water balance requirement. The Division will let the Permittee know of the new criteria sometime in the spring of 2006. The Division will request that the Dugout Canyon Mine resubmit the equations relative to the Windy Gap Process sometime in the future after the new criteria have been established. The Division does not expect significant changes to the current information.

**Findings:**

The submitted information meets the current requirements established by the Division.

**SUPPORT FACILITIES AND UTILITY INSTALLATIONS**

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

**Analysis:**

The Pace Canyon Fan Portal installation is a support facility whose purpose is to enhance the underground ventilation system of the Dugout Canyon Mine. The facility contains backup utilities to ensure continuous operation of the Mine fan located here. This facility has already been discussed in this document.

**Findings:**

The minimum regulatory requirements of this section have already been met.

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### SIGNS AND MARKERS

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

#### Analysis:

The Permittee has installed all signs and markers required by R645-301-521, which includes permittee identification signs, disturbed area perimeter markers, stream buffer zone markers, topsoil storage sign markers, etc. All required markers are installed as needed; including the new Pace Canyon fan portal disturbed area. The requirements of R645-301-521 are checked on a monthly basis during regular DOGM inspections.

#### Findings:

The minimum regulatory requirements of this section are being met.

### USE OF EXPLOSIVES

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

#### Analysis:

##### General Requirements

**APPENDIX 5-8**, Dugout Canyon Mine Blasting Plan contains information for surface blast designs that are intended for the demolition of rock and boulders, and trenching for footings. This plan was approved / incorporated on January 5, 1999, by permit amendment 98G.

**APPENDIX 5-9**, Sewer Pipeline Blasting Plan was a surface blasting plan approved by the Division for the purpose of excavating a trench for the pipeline connecting the Dugout Canyon Mine bath house / shop facilities with the leach field located one mile down Canyon from the Mine. This plan was approved / incorporated by the Division on or about September 24, 2001.

**APPENDIX 5-9**, Dugout Canyon Mine Blasting Plan, was submitted to the Division for review on April 25, 2005, as part of the Pace Canyon fan portal application. The blast design is for the development of a vertical shaft twenty feet in diameter. As noted elsewhere in this document, a vertical airshaft was necessary to connect the return air courses of the Mine to the ventilation fan located on the surface. At the time of the application, it was not known what type

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of construction method would be necessary to develop the twenty foot diameter hole, which was to be approximately seventy feet deep. Sandstones of the Blackhawk formation needed to be broken in order to excavate the hole. The Permittee's contractor eventually used a hydraulic ram on a track hoe to break the initial layers of rock. Therefore, blasting activities were never needed to construct the upper section of the shaft. The Division approved this blast design on May 6, 2005, in conjunction with the Pace Canyon fan portal approval.

### **Findings:**

The Permittee has met the minimum regulatory 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:**

#### **Mine Workings Maps**

Mine workings are depicted as "2004 Production RC" (Rock Canyon seam) and "2004 Production GIL" (Gilson seam) and are submitted as part of the 2004 Annual Report. These maps clearly identify where coal has been extracted during the 2004 production year. "2004 Production GIL" also shows outlines for the old mine workings (pre-SMCRA) in the Rock Canyon and Gilson seams, as well as an outline for the old Snow Mine workings. "2004 Production RC" depicts the outline of the old mine workings in the Rock Canyon seam. Both maps are P.E. certified by Mr. Dave Spillman, Utah registered professional engineer.

Plate 5-1, PREVIOUSLY MINED AREAS, shows the old mine workings in both the Rock Canyon seam and the Gilson seam as they once existed adjacent to and beneath Dugout Canyon. This map is P.E. certified by Richard B. White, Utah registered professional engineer (September 1998 certification).

#### **Certification Requirements**

All of the Plates mentioned within this document have received a professional engineer's certification from an engineer licensed to practice in the State of Utah.

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**Findings:**

The minimum regulatory requirements of this section have been met.

## **RECLAMATION 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:**

**Retention**

The road associated with the Pace Canyon fan portal disturbance is unique for several reasons:

- 1) This road existed on BLM surface although access to the construction disturbance is barred by a gate on private surface ownership (Thayn land).
- 2) The Pace Canyon road, up to the private gate on Thayn land, is a Carbon County road.
- 3) The road provides access to the Pace Canyon fan portal area, as well as private land that is located at upper elevations of the Roan Cliffs.
- 4) The Permittee's approved reclamation plan allows for the reclamation of the road, as it exists past the fan portal installation, but also allows for the re-construction of the road in a new location (within the Pace fan portal disturbed area), such that it still provides access to the upper elevations post-mining.

**Findings:**

The approved reclamation plan meets the minimum regulatory requirements of this section.

## **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:**

#### **Reclamation Backfilling And Grading Maps**

Chapter 5, Plates 5-5, 5-5A, 5-6 (1), 5-6 (2), 5-6 (3), 5-6 (4), 5-6 (5), 5-6 (6) depict the plan view of the reclamation topography, earthwork map, and reclamation cross sections which are to be implemented during the reclamation of the Dugout Canyon Mine main facilities area. All plates are P.E. certified by a Utah registered professional engineer.

**PLATE PC5-5 PACE CANYON FAN RECLAMATION TOPOGRAPHY AND CROSS-SECTIONS** depicts longitudinal cross-sections A-A' and C-C' as well as transverse cross-section B-B'. These are the "proposed" cross-sections that will be followed as closely as possible to return the site to a post-mining configuration. There are no major, excessively steep fills depicted for the reclamation process. Plate PC5-5 is P.E. certified by a Utah registered professional engineer.

#### **Reclamation Facilities Maps**

Proposed reclamation topography maps and cross-sections are depicted for each of the following areas:

- 1) **PLATE 5-5, RECLAMATION TOPOGRAPHY;** (main mine facilities area) (Volume 3, Chapter 5).
- 2) **PLATE 5-5A, EARTHWORK MAP;** (main mine facilities area) (Volume 3, Chapter 5).
- 3) **PLATES 5-6 (1 thru 6), RECLAMATION CROSS SECTIONS;** (main mine facilities area) (Volume 3, Chapter 5).
- 4) **PLATE PC5-5, PACE CANYON FAN RECLAMATION TOPOGRAPHY AND CROSS-SECTIONS,** as contained in Chapter 5, APPENDIX 5-9.

These are the main disturbed areas associated with the Mine. The degasification well amendments also contain proposed post-reclamation topography maps. All structures associated with the mining operation will be reclaimed prior to the initiation of earth moving activities. The only structures that will remain will be the high voltage power line and the Carbon County road

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up to the site(s). Access through the disturbed areas will also be retained, as the roads existed prior to the construction of the Mine facilities.

All plates are certified by a Utah registered professional engineer.

### **Final Surface Configuration Maps**

Final surface configuration maps or “as-builts” will be submitted upon the completion of the reclamation activities in each of the disturbed areas.

### **Reclamation Treatments Maps**

Volume 3, Chapter 5, **APPENDIX 5-10**, contains **PLATE PC 5-6, PACE CANYON FAN RECLAMATION TREATMENT MAP**, which depicts the methods which will be used to minimize erosion and enhance re-vegetation of the disturbed area in Pace Canyon.

The current MRP does not contain a reclamation treatment map for the main mine facilities area located in Dugout Canyon. Although construction of the reclamation channels, removal of the sediment pond, and interim sediment control is briefly discussed in Volume 3, Chapter 5, pages 5-67 and 5-68, the methods discussed for sediment control only discuss utilization of silt fences, which are located “perpendicular to the flow direction in accordance with Figure 5-4”. Figure 4 is the standard drawing depicting the accepted method of silt fence construction.

Reclamation treatments maps are required to depict the following:

- 1) Location, extent and depth of materials used for resoiling.
- 2) Location, types and types of treatments for revegetation including soil preparation, soil amendments, mulching, seeding, variations in seed mixtures, and other revegetation treatments.
- 3) Each water diversion, collection, conveyance, treatment, storage, and discharge facility, to be used during reclamation.
- 4) Each facility to be used to protect and enhance
- 5) Fish and wildlife related environmental values.
- 6) Other treatments that are specifically designed or required as part of phased or final reclamation activity must be depicted.

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Thus, the MRP is deficient in that the current approved reclamation plan does not contain a reclamation treatment map for the main facilities area, the waste rock site or the leach field that depicts the aforementioned items.

**Findings:**

The MRP is deficient. In accordance with:

**R645-301-731.720; R645-301-746.221, Slope Protection; and R645-301-746.320**, the Permittee must submit reclamation treatments maps for the proposed reclamation of the following sites; the main facilities area, the waste rock site, and the leach field area.

**RECOMMENDATIONS:**

The Permittee must address the aforementioned deficiencies before a recommendation for approval of this mid-term permit review can be made.