

# TECHNICAL MEMORANDUM

## Utah Coal Regulatory Program

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February 17, 2006

TO: Internal File

THRU: Pamela Grubaugh-Littig, Permit Supervisor  
Peter H. Hess, Environmental Scientist III/Engineering, Team Lead

FROM: David W. Darby, Environmental Scientist III/Geohydrologist

RE: Methane Degasification Well G-11 and G-12, Canyon Fuel Company, Dugout Canyon Mine, C/007/0039, Task ID #2408

### **SUMMARY:**

On December 27, 2005, Canyon Fuel Company submitted an application to permit the drilling of methane degasification borehole G-11 and G-12 at the Dugout Canyon Mine. The purpose of the borehole will be drilled on small pads developed adjacent to Pace Canyon Creek (Figure 3-1), Section 20, T.13 S., R. 13 E. The degassification wells will be used to remove methane gas from the mine workings.

Prior to this application, the operator had proposed plans and received approval for other methane degasification boreholes, drilled from the surface to the Gilson coal seam. The request for the methane degasification wells is based on safety need, to remove the natural gas from the coal seam prior to mining.

### **TECHNICAL ANALYSIS:**

## ENVIRONMENTAL RESOURCE INFORMATION

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

### **GENERAL**

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

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### Analysis:

The Permittee has proposed to meet this requirement by submitting information showing the location of the proposed degasification wells a G-11 and G-12 (Figure 1-1). The degasification well sites will be developed near existing private roads as shown on Figures 1-1 and on Figures in Attachment 5-1. Plans showing how the site will be built to control erosion and prevent runoff impacts, Attachment 5-1. Some information has also been provided for reclamation of the sites.

### Findings:

There are some concerns with the submittal that will be addressed in the following sections.

## PERMIT AREA

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

### Analysis:

The two disturbed areas for the degasification boreholes are shown on figures in Attachment 5-1. (The figures are labeled with similar numerals, which is confusing). The degasification sites lie within the approved permit area. The area of disturbance is not stated, the sites are to be less than an acre. The Permittee should state the size of the disturbed areas in the text and on the maps.

### Findings:

The information in the MRP does not meet the minimum requirements of the regulations for the Permit Area section.

**R645-301-521**, The Permittee should include in the disturbed area all structures related to the site including the water bars. The Permittee should submit disturbed area sizing calculations.

## HYDROLOGIC RESOURCE INFORMATION

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

### Analysis:

### **Sampling and Analysis**

The Permittee has a surface and ground water monitoring plan in place for the permit area to help determine impacts from mining. There are no water resources on the proposed well site to monitor.

### **Ground-water information**

The Permittee has provided maps showing there are no springs on or adjacent to, the well site. Ground water could be contacted during drilling. The Permittee has addressed this issue in the PHC Determination in Section 728.300. Drilling mud may come in contact with groundwater during drilling. Contact with groundwater should be limited to the drilling phase. The drilling mud will coat the radius of the degassification well where drilling pressures are greater than the groundwater pressure. If the groundwater has a higher pressure than the drill mud then very little contamination should take place. Once drilling is completed, the casing will be grouted in the well hole to prevent any groundwater migration between strata. The applicant should report the depth of groundwater if outflow occurs.

### **Baseline Cumulative Impact Area Information**

The degassification wells lies within the mine permit area and within the boundaries of the existing CIA.

### **Modeling**

No groundwater modeling was conducted for this site. Surface water calculations were presented for area runoff flow based on the SCS-TR-55 for Type II storms.

### **Probable Hydrologic Consequences Determination**

#### *Adverse impacts to the hydrologic balance*

The Permittee describes in this section the potential impacts of the drill sites. The drill sites may temporally affect perched lenses of perched groundwater adjacent to the degassification well as a result of using drilling mud. The annulus of the degassification well will be sealed with cement to prevent migration of groundwater between strata. The degassification wells will be sealed when no longer needed. The quality and quantity of surface and groundwater flow. Any impacts (if any) to groundwater will be temporary. Any groundwater contacted may not be an aquifer under the definition of the rules. To be an aquifer the strata has to be able to store water and transmit groundwater in sufficient quantities for a specific use. Groundwater is not used for drinking.

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The Permittee plans to minimize potential surface water impacts by constructing a berm and silt fences around the disturbed area of the drill sites and topsoil piles.

Permittee does not show sizing calculations for the pad or include in the disturbed area all road disturbance and water bars. The permittee has not calculated the amount of runoff that will be generated during the 10 yr-24 hr runoff event and check if the silt fences can treat the runoff.

### *Acid forming or toxic forming materials*

The probable impacts from acidity, total suspended solids and total dissolved solids were assessed in the MRP by the Permittee. Information in Chapter 6 and 7 indicates there are no acid- and toxic-forming materials at the Dugout Canyon Mine to cause adverse impacts from drilling.

### *Ground water and surface-water availability*

The Permittee has evaluated potential adverse effects to the hydrologic balance from the mining operations.

Once mining ceases the mine will be sealed and all wells will be sealed according to State rules and federal regulations. Hydrology structures have been designed to safely pass the peak flow resulting from the 10-year, 6-hr precipitation event, so flooding in the reclaimed areas will be minimized. Interim sediment-control measures and maintenance of the reclaimed areas during the post-mining period will preclude deposition of sediment in downstream channels.

### *Sediment yield from the disturbed area*

The potential impact of mining and reclamation on sediment yield is an increase in sediment in surface waters downstream from disturbed areas. However, sediment-control measures consisting of berms and silt fences will be installed to minimize this impact, while drilling and venting activity is conducted. The sediment controls will remain in place until the site is no longer needed. The degassification wells will be plugged and the site regraded and revegetated. These measures will reduce the amount of erosion and control adverse impacts to the environment.

### *Potential Hydrocarbon Contamination*

Diesel fuel, oils, greases, and other hydrocarbon products will be stored and used at the site for a variety of purposes. Diesel and oil stored in above-ground tanks at the mine

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surface facilities may spill onto the ground during filling of the storage tank, leakage of the storage tank, or filling of vehicle tanks. Similarly, greases and other oils may be spilled during use in surface and underground operations. The probable future extent of the contamination caused by diesel and oil spillage is expected to be very small, because the tanks will be located above ground and spillage during filling of the storage or vehicle tanks will be minimized to avoid loss of an economically valuable product.

A Spill Prevention Control and Countermeasure Plan (SPCC) is in place for the mine disturbed areas. The plan provides for inspection, training, and operation measures to minimize the extent of contamination resulting from the use of hydrocarbons at these sites. This plan is not required to be submitted as part of the MRP; a copy is maintained at the mine site as required by the Utah Division of Water Quality (p. 7-50).

### *Road Salting*

No salting of roads will occur within the permit area so this potential impact is not a concern (p. 7-50).

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

There will be no water monitoring at the degasification borehole sites G-11 and G-12. The Permittee has monitored hydrologic sites throughout the mine's permit area for baseline conditions. The data has been entered into the Utah Coal Water Monitoring database. Overall surface water quality and quantity information was considered sufficient to characterize baseline conditions for the disturbed areas associated with the mine.

### **Findings:**

Information provided in the plan does not meet the minimum requirements of the regulations for this section.

**R645-301-720**, During the course of drilling the Permittee will be required to report all contact of groundwater of high volumes or pressures observed at the degassification wells.

**R645-301-732-100, R645-301-742.200**, The Permittee shall show sizing calculations for the pad or include in the complete disturbed area for all road disturbance and water bars (Attachment 5-1). The Permittee shall calculate the amount of runoff that will be generated during the 10 yr-24 hr runoff event and check if the silt fences can treat the runoff. The permittee shall provide calculations to show the silt fences can treat the runoff prior to discharge.

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

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

**Analysis:**

**Affected Area Boundary Maps**

The Permittee has met the requirements of R645-301-521.141 by supplying the figures in Attachment 5-1. The figures show the boundaries of the drill sites G-11 and G-12.

**Mine Workings Maps**

The Figures in Attachment 5-1 shows the location of surface facilities, their elevations and dimensions.

**Monitoring and Sampling Location Maps**

Elevations and locations of monitoring stations used to gather data on water quality and quantity in preparation of the application are provided in the MRP.

**Subsurface Water Resource Maps**

The subsurface water resources adjacent to the degasification well are identified on Plate 7-1, MRP, Hydrologic Monitoring Stations.

**Surface Water Resource Maps**

Surface waters that will receive discharges from affected areas in the proposed permit are shown on Plate 7-1, MRP.

**Well Maps**

There are no water wells within the proposed degasification well area.

## **Contour Maps**

Figures in Attachment 5-1 show the operational topography for the drill pad. It also shows the topography after reclamation. The figures do not show the relationship of the disturbed area to the stream channel of Pace Canyon Creek.

## **Findings:**

The information provided by the Permittee does not meet the minimum regulatory requirements of the Maps, Plans and Cross Sections for Resource Information.

**R645-301-730**, The figures in Attachment 5-1 should provide contours on the figures that show the stream channel in relation to the proposed degassification well sites.

# **OPERATION PLAN**

## **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:**

### **Ground water monitoring**

Degassification wells G-11 and G-12 will be developed in Pace Canyon in the middle of the escarpment, Sections 20 of T.13 S., R.13 E. There are no springs, streams, ponds or lakes on degassification well sites. There are perched springs in adjacent canyons Plate 7-1 of the MRP, mostly on top of the escarpment. These springs will not be impacted by the drilling. The permittee has a water monitoring plan in place to detect water quality and quantity changes during mining. The degassification well will be intersecting the Northhorn, Price River Castlegate and Blackhawk Formations. The springs sources are recharged are from the Flagstaff and upper Northhorn Formations.

The Applicant has submitted a Figure 1 in Attachment 5-1 for G-11. The figure shows the drainage plan. Pace Canyon Creek is adjacent to the degassification wells and will receive filtered runoff after it passes through the silt fences from degassification well G-11. A pond is

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identified below one of the silt fences. A water bar located on the road above will also direct flow to the pond. It appears that sheet flow from the disturbed area will be directed toward the pond and down the road to another water bar where flow will leave the site untreated.

The Applicant has submitted a Figure 1 in Attachment 5-1 for G-12. The figure shows the drainage plan. Pace Canyon Creek is adjacent to the degassification well and will receive filtered runoff after it passes through the silt fences.

### **Surface Water Monitoring**

The Permittee continues to conduct the water-monitoring program for the permit area. There is no surface water monitoring sites on or next to the proposed degassification well pads. The channels adjacent to the escarpment are ephemeral.

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

Analyses presented in Chapters 6 and 7 of the MRP indicate that acid and toxic-forming materials are not present within the permit area. Parameters defining acid and toxic-forming materials will periodically be monitored as described in Chapter 6. In the event that acid or toxic-forming materials are identified, they will be disposed of in appropriate waste-rock disposal facilities as described in Chapter 5 of the MRP.

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

The Permittee has proposed to treat runoff and sediment by placing a containment berm around the disturbed area. Any flow from the site will be treated via silt fence or straw bale. The volumes of runoff to be contained in the in the bermed (disturbed) area is based on the 10 yr-24 hr storm event of 2.0 inches and a D soil group. The permittee submitted calculations for the topsoil stockpiles, but not the drill pad area. Using a conservative curve number of 89, the calculated runoff volume for is topsoil stockpile G-11 is 166 cubic feet and 334.5 cubic feet for topsoil stockpile G-12. A berm will surround the drill pad to divert flow away from the drill pad and contain and divert disturbed area runoff to the silt fences on the site.

### **Diversions: General**

During initial drilling, the sites will be graded to ensure that storm runoff will flow towards the berms surrounding the drilling pad area. The berm will direct runoff to the lowest point within the pad area where a silt fence and/or straw bales will be used to treat runoff. The silt fence and/or straw bales will be inspected periodically to maintain functionality. Berms will be used to around the topsoil stockpile to contain runoff on site. The Permittee has

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provided designs for a containment berm around the topsoil stockpiles. The designs are shown in Attachment 7-1. The Permittee should provide information for the size of the berm around the drill pad sites.

A culvert will be installed above drill pad G-12 to direct flows from an adjacent drainage under the canyon road to Pace Canyon creek. The Permittee has provided calculations for the culvert. The calculations appear to be complete.

### **Stream Buffer Zones**

The Permittee states in Section 521.200 that stream buffer zone markers will be placed at G-11 and G-12. However, in Section 731.600 the Permittee states that since there is no perennial a buffer zone is not necessary. The size of the drainage adjacent to Degassification well G-12 is less than a square mile so the drainage is not intermittent (by definition) either. However, since the drill pads are adjacent to Pace Canyon Creek, whose drainage area is greater than a square mile (making it an intermittent stream channel, by definition). A buffer zone is required unless waived by the Division.

The Division will grant a waiver for a 100 ft buffer zone if the Permittee places markers adjacent to the roadway identifying a protected area so disturbance, after construction is controlled. The Permittee has shown in Chapter 5, figures in Attachment 5-1, that sedimentation structures will be used to minimize impacts to the stream. The Permittee will be required to keep equipment out of the creek and place some markers adjacent to the roadway to identify the area as a buffer zone.

### **Sediment Control Measures**

Measures to control sediment include the use of berms, water bars, a culvert, and silt fences. Information has been requested under the Hydrologic Resources Information section.

### **Siltation Structures: Exemptions**

ASCA's or alternate sediment control areas are disturbed areas that do not drain to a catch basin or sediment pond. Runoff from these areas is treated using silt fences and straw bales. The Permittee has not identified the Degassification sites G-11 and G-12 as ASCA's.

### **Discharge Structures**

No discharge structures will exist for this site.

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**Hydrologic Balance Protection**

The information provided by the Permittee indicates that the only water that will be consumed for this operation will be for the drilling aspect. There will not be any mine water discharge from this degasification well.

**Findings:**

Information provided in the plan does not meet the minimum requirements of the regulations for this section. See deficiencies under the Environmental Resource Information Sections.

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

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

**Analysis:**

**Affected Area Maps**

The Permittee has supplied several maps and figures that depict the boundaries of the proposed well site.

**Monitoring and Sampling Location Maps**

Monitoring sites are shown on Plate 7-1 of the MRP.

**Certification Requirements**

Cross sections, maps, and plans have been prepared by, or under the direction of a qualified, registered professional engineer.

**Findings:**

The information provided by the Permittee does not meet the minimum regulatory requirements of the Maps, Plans and Cross Sections for Resource Information. In previous sections, the Permittee was asked to resubmit figures providing a complete disturbed area to include all disturbed areas and topographic line data.

# **RECLAMATION PLAN**

## **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:**

A reclamation plan for the well sites is presented in Section 540. When no longer needed the degassification well sites will be reclaimed. The methane venting will cease and the Permittee will seal the wells permanently from bottom to top in accordance with the regulations. No structures will remain. A timetable for reclamation is presented in Figures 5-15.

### **Findings:**

The Permittee has supplied sufficient information to meet the minimum regulatory requirements.

## **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 natural drainage pattern will be restored to approximate original contour. A permanent water swale will replace the culvert above G-12. Designs are shown in attachment 5-1.

### **Findings:**

Information provided in the application meets the minimum requirements of the R645 coal rules.

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**CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT  
(CHIA)**

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

**Analysis:**

The degasification well site is within the current cumulative impact area. The CHIA will be updated to include the well site. No additional impacts are expected from construction of the well site.

**Findings:**

The Division will update the CHIA to include the area of surface disturbance.

**RECOMMENDATIONS:**

The hydrologic section of this submittal is not recommended for approval until all deficiencies listed in the findings are addressed.