

# TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

August 3, 2006

TO: Internal File

THRU: Wayne Hedberg, Permit Supervisor, Task Manager  
Peter H. Hess, Environmental Scientist/Engineering, Team Lead *DWH*

FROM: David W. Darby, Environmental Scientist/Hydrogeologist *[Signature]*

RE: 2005 Midterm Permit Review, Canyon Fuel Company, LLC., Dugout Canyon Mine, C/007/0039, Task ID #2528

## TECHNICAL ANALYSIS:

## 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:

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

##### *Dugout Canyon Mine*

Water quality standards and effluent limitations are being met through a variety of runoff treatment controls, which include a sediment trap and sedimentation pond and diversion structures to separate disturbed area runoff from disturbed areas. The Permittee has obtained a Utah Pollution Discharge Elimination System (UPDES) permit UT0025593, permitted by the Utah Division of Water Quality. Three discharge sites are located at the Dugout Canyon Mine facilities; two are for the mine discharges, outfall numbers 001 and 003. They are located on the upper end of the disturbed area, where they both discharge directly into the creek. The third site

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is located at the sedimentation pond discharge (outfall numbers 002). Mine water is discharged at an average rate of about 190 gpm. Mine water is not continuous, it is mechanically controlled and a function of the amount of water encountered in the mine and amount of water used or evaporated.

Effluent limitations and monitoring requirements are identified in the UPDES Permit in Appendix 7-6 of the MRP. Canyon Fuel Company is submitting all UPDES information to the DOGM Water Quality Database.

*Pace Canyon Fan Portal*

The Pace Canyon surface facilities are currently under construction. Sediment control at the site is being achieved using alternate sediment control measures, which include contemporaneous reclamation, using clean gravel on pads and roads, silt fences and a sedimentation pond (the Permittee likes to call it a sedimentation trap). The sediment pond has a containment capacity of 5000 cu-ft (0.115 ac-ft). The Permittee discharges from the same UPDES permit UT0025593, site 005.

During the midterm evaluation at Pace Canyon Fan Portal, a small, disturbed area above the newly installed side channel culvert had no runoff control. This situation was overlooked by the Permittee because work activity was ongoing in the area, and the area was small. No damage or offsite runoff had occurred. The Permittee was directed to install a silt fence to ensure no sediment will reach the undisturbed drainage and culvert. No violation was issued.

*Refuse Pile*

The Refuse Pile sedimentation pond is designed for total containment. It contained water from a recent storm event. There are no plans to change the pond; it is over designed compared to the disturbed area. The discharge site at the refuse pile is Site 004 from the same UPDES permit UT0025593.

**Diversions: General**

*Dugout Canyon Mine*

The review team observed the disturbed area diversions at the Dugout Canyon Mine facilities during the field visit. All diversions appeared to be functioning. Undisturbed diversions are identified on Plate 7-5 of the MRP. Disturbed area water shed boundary and alternate sediment control areas are shown on Plate 7-8 of the MRP. The mine's diversion ditches are listed in Diversion Ditch designs are summarized in Table 7-9. The disturbed area diversions on the south side of the mine facilities collect high concentrations of coal fines and

other debris, because the loadout activities are conducted there. The Permittee has installed a sediment trap to collect the heavy concentrations of coal fines. The sediment trap is a small concrete pool with a ramp to allow easy removal of sediment and coal fines with a front-end loader. Diversions flowing toward the north side of the Dugout facilities flow to the sedimentation pond. According to the MRP, all diversions have been designed, located, constructed, maintained, and used to prevent, to the extent possible, additional contributions of suspended solids to stream flow outside the permit area.

#### *Pace Canyon Fan Portal*

The site is still under construction. Silt fences are erected adjacent to Pace Canyon Creek and capture sediment before it reaches the channel. The Permittee still has to shape the surface and install the diversions. When completed, the diversions will drain to the sediment pond.

#### *Refuse Pile*

The review team visited the refuse pile in response to an amendment submitted by Canyon Fuel Company. The Permittee will submit plans to redesign the undisturbed drainage above the refuse pile.

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

Dugout Canyon creek is the only intermittent stream diverted within the permit area. The Culvert appeared intact during the midterm review and the two concrete headwalls in the main channel and in the south channel also appeared intact. Vicky Miller pointed out previous problems with the South culvert plugging during high runoff events. To prevent future problems from clogging the Canyon Fuel Company designed a heavily reinforced debris rack for each headwall. Hydrologic designs for the area are presented in Appendix 7-10. Culvert designs for Dugout Canyon are provided in Appendix 7-9.

No perennial or intermittent streams are diverted at the Pace Canyon Mine or the refuse pile.

#### **Stream Buffer Zones**

#### *Dugout Canyon Mine*

The stream in Dugout Canyon is contained in a culvert under the surface facilities. Stream buffer zone markers have been placed above the disturbed area of the surface facilities and below the sedimentation pond where the stream exits the culvert.

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*Pace Canyon Mine*

Stream buffer zone markers were installed along Pace Canyon Creek and adjacent to the side drainage above the new culvert.

*Refuse Pile*

There are no stream buffer zone markers at the Refuse Pile site.

**Sediment Control Measures**

Sediment control measures are designed to prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area. The Permittee is required to meet State and Federal effluent limitations and minimize erosion to the extent possible. As stated in previous sections, the structures used for the run-off control plan for the permit area include disturbed and undisturbed area diversion channels, sedimentation ponds, containment berms, silt fences, and road diversion culverts.

*Dugout Canyon Mine*

A series of sediment control structures control and contain sediment at the Dugout Canyon Mine surface facilities to prevent off site impacts. Undisturbed runoff is kept from entering the disturbed area of the surface facilities via diversion ditches and culverts. Contaminated runoff from the disturbed areas is captured and directed to the sediment pond or the sediment trap to be treated before it leaves the minesite. The sediment trap removes a high percentage of coal fines and sediment from the loadout area prior to discharging to the sedimentation pond. The calculations and design of sediment control structures presented in Appendices 7-8 through 7-12, these sediment control measures are designed using industry standards and what is generally considered the best technology currently available (BTCA). During the field visit, the sediment trap and sedimentation pond appeared very functional.

The Permittee recently submitted an amendment to remove decant valve, because of maintenance problems. The amendment was approved. A pump will be used to dewater the pond instead. It is an acceptable method and water quality will have to meet the UPDES standards prior to being discharged.

Design calculations for the sedimentation pond is provided in Appendix 7-8 of the MRP.

*Pace Canyon Fan Portal*

Undisturbed runoff is diverted away from the disturbed area by undisturbed by-pass ditches and a water bar on the county road. Plans were approved to route the ephemeral side drainage through a culvert. Total containment berms encircle the two topsoil piles. Total containment berms encircle the two topsoil piles and will hold all of the runoff from a 10-yr, 24 hr precipitation event. Runoff will report to the sedimentation pond (trap) when construction is complete. Silt fences are being used to trap sediment before it leaves the disturbed area. Design calculations for the sedimentation pond are provided in Appendix 7-12 of the MRP.

*Refuse Pile*

Undisturbed runoff is diverted around the refuse pile site. Plate RA7-1 shows the diversions on the refuse pile site. A berm encircles the refuse pile, collects runoff and transmits it to the sedimentation pond. Total containment berms encircle the two topsoil piles and will hold all of the runoff from a 10-yr, 24 hr precipitation event.

**Alternative Sediment Control Areas (ASCAs)**

*Dugout Canyon Mine*

The Permittee has submitted Plates 7-8, in the Dugout Canyon Mine MRP; this Plate identifies the alternate sediment control areas (ASCAs). Two ASCAs have been implemented in the field, and represent the Best Technology Currently Available (BTCA) in controlling sediment in areas that do not report to the sedimentation pond. One ASCA is on and below the face of the sediment pond and the other is the road above the surface facilities.

*Pace Canyon Fan Portal*

As mentioned, the Fan Portal is still under construction. Plans provide in the MRP, Appendix 7-12 show the disturbed contained within a berm to keep it contained and away from the road. The road is a county road. The outslope of the road is riprapped and reinforced with a rock wall. The Permittee has placed a silt fence below those structures to trap sediment. The silt fences will remain throughout mining.

*Refuse Pile*

Modifications are still being made to the refuse pile. The current plans (Plate 7-1) show a topsoil stock pile and subsoil pile, which the Permittee states will be encircled by a berm. There is not a berm shown on Plate RA7-1. A berm is shown that will encircle the refuse pile and then

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direct the flow to ditches DD-3a and DD-3b that carry the flow to the sedimentation pond. All berms and diversions appeared intact during the midterm site visit.

**Siltation Structures: Sedimentation Ponds**

*Dugout Canyon Mine*

Siltation structures in the main facilities area consist of a concrete sediment trap and a sediment pond. The concrete sediment trap is designed to remove in excess of 65% of all solids from the disturbed area runoff before the water enters the main sedimentation pond. The sediment trap, constructed in series with the main pond, was implemented in order to reduce the sediment load to the sedimentation pond as well as reduce the cleaning. The sedimentation pond will fully contain the runoff from the 10-year/24-hour storm event and will adequately pass the 25-year/6-hour precipitation event through the emergency spillway. During the midterm site visit, the sedimentation pond was observed. The pond appeared intact and sound.

*Pace Canyon Fan Portal*

Canyon Fuel Company plans to use alternate sediment control measures to control sediment control at the Pace Canyon Fan Portal. It will achieve control by using contemporaneous reclamation, clean gravel placed on pads and roads, silt fences, and a sediment trap (which is just a small sedimentation pond). The sediment trap is intended as an extra measure of protection for sediment control. Hydrology calculations and sedimentation pond sizing calculations are provided in Appendix 7-12 of the Pace Canyon Fan Portal Amendment. The sediment trap is designed to hold all of the 10-yr, 24-hr storm event or 0.71 inches. The sediment trap's spillway is designed to pass the 25-yr, 6-hr storm event. The spillway consists of an 18-inch CMP for a maximum outlet velocity of 7.2 fps. During the midterm site visit, the sedimentation pond was observed. The pond appeared intact and sound.

*Refuse Pile*

The sedimentation pond located at the refuse pile is a total containment pond. Pond sizing calculations are provided Appendix 7-12. During the midterm site visit, the sedimentation pond was observed. The pond appeared intact and sound.

**Findings:**

The MRP contains commitments to use BTCA to prevent additional contributions of suspended solids to stream flows outside of the permit area.

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There was only one problem found during the site visit that required upgrading. As mentioned, the area in Pace Canyon above the new side channel culvert needed a silt fence to protect the undisturbed drainage from excavation work. The Permittee committed to install the silt fence at the time of the midterm visit. This was not a major problem and can be resolved by a review from the inspector.

**RECOMMENDATIONS:**

The hydrology portion of the midterm review is complete and recommended for approval.

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