

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

December 27, 2005

TO: Internal File

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

FROM: David W. Darby, Environmental Scientist III/Hydrologist
Peter H. Hess, Environmental Scientist III/Engineering, Team Lead

RE: Mid-Term Review, Canyon Fuel Company, LLC., Dugout Canyon Mine, 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.

Three disturbed areas were observed during the midterm review site visit: the refuse pile, the Pace Canyon surface facilities, and the main Mine surface facilities. No disposal is currently taking place on the refuse pile, although it is considered active. The Permittee has submitted plans to expand the refuse pile. This includes a revision of the proposed final surface configuration calculations and drawings such that it effectively blends with the surrounding, undisturbed topography. The Permittee is also redesigning the undisturbed drainage to direct it around the refuse pile. Mining activities are being conducted at the Dugout Canyon Mine facilities. Pace Canyon remains in the construction phase, although those activities are near completion.

Seven areas of the MRP have been selected by the Division as part of the evaluation process. These include the following:

1. An AVS check to ensure that Ownership and Control information is current and correct.
2. 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. One area of emphasis is to ensure compliance with the U. S. Fish and Wildlife Windy Gap Process.

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3. A review of the plan to ensure that the requirements of all permit conditions, division orders, notice of violation abatement plans, and permittee initiated plan changes are appropriately incorporated into the plan document.
4. A review of the applicable portions of the permit to ensure that the plan contains commitments for application of the best technology currently available (BTCA) to prevent additional contributions of suspended solids to stream flows outside of the permit area.
5. A review of the bond to ensure that it is in order and that the cost estimate is accurate and is escalated to the appropriate year dollars.
6. A review of the MRP commitments for the subsidence control/monitoring plans and reporting requirements.
7. The Division may conduct a technical site visit in conjunction with the assigned compliance inspector to document the status and effectiveness of operational, reclamation, and contemporaneous reclamation practices.

On November 29, 2005, the Division conducted a site visit at the Pace Canyon fan portal and Dugout Canyon mine facilities area.

This memo will address hydrology issues related to Items 2 and 4.

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 main facilities area

Water quality standards and effluent limitations are being met through a variety of runoff treatment controls which include three sediment traps, and two sediment ponds as well as diversion structures to route disturbed area runoff through these treatment facilities. The Permittee has a Utah Pollutant Discharge Elimination System (UPDES) permit UT0025593, issued by the Utah Division of Water Quality. Three outfalls are located at the Dugout Canyon Mine facilities; two are for mine water discharges, (001A and 003A). They are located on the upper end of the disturbed area, where they both discharge directly into Dugout Creek. The third outfall is the sediment pond discharge (002A). Mine water is discharged at an average rate of approximately 190 gpm. The Mine water discharge is not continuous. It is mechanically controlled, and the pumping is a function of the amount of water encountered from the old workings versus the amount of water used or evaporated.

The Dugout Canyon Mine waste rock disposal facility also has one UPDES outfall, which is the open spillway discharge from the sediment pond to the ephemeral drainage located just outside the disturbed area perimeter.

The current UPDES permit also has two outfalls permitted for the Pace Canyon fan portal facilities. One outfall is the discharge pipe from the sediment trap (UPDES 006A) located on the southern end of the disturbance. The other outfall is a mine water discharge point (005A).

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 as well as other appropriate government agencies.

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 trap / pond. The sediment pond (UPDES 005A) has a containment capacity of 5,000 cubic-feet (0.115 ac-ft).

During the midterm evaluation of the Pace Canyon fan portal construction area, a small, area adjacent to the inlet of undisturbed by-pass culvert PCUC-2 had no treatment method in place. The area had been discussed by Permittee employees prior to the DOGM on-site visit, but the installation of treatment had not been completed. No damage or offsite runoff had occurred. The Permittee was directed to install a silt fence, or straw bales to treat any disturbed area runoff reporting to the undisturbed culvert.

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Refuse Pile

The refuse pile sediment pond is designed for total containment of the design event. It contained water from a recent storm event. There are no plans to increase the ponds treatment capacity as it is over designed for the amount of runoff reporting from the disturbed area. As mentioned above, the outfall is designated as UPDES 004A.

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. The disturbed area water shed boundaries 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 (See Table 7-9). The disturbed area diversions on the southeast side of the mine facilities collect high concentrations of fines and other debris, because the loadout activities are conducted there. The Permittee has installed two sediment traps to collect the heavy concentrations of coal fines. The sediment traps are small concrete containments with lateral ramps to allow for the easy removal of sediment. The sediment traps operate in series with the final effluent reporting to the Mine site sediment pond. The two sediment traps are not depicted on Plate 7-5, but are depicted on Plate 5-2. As the sediment traps are relative to hydrology, they need to be depicted on Plate 7-5. Diversions flowing on the northwest side of the Dugout facilities flow directly to this same pond. Many of the disturbed area diversions in the main facilities area are concrete lined. 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 Creek is the only intermittent stream diverted within the permit area. The main undisturbed by-pass culvert (UC-5, See PLATE 7-5) appeared intact during the midterm review. The two concrete headwalls (inlet of UC-5, and outlet of UC-4) also appeared intact. Previous problems have occurred with the trash rack located at the inlet of UC-4, (debris blockage during high runoff events). 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 fan portal or the refuse pile.

Stream Buffer Zones

Dugout Canyon Mine

The stream in Dugout Canyon is contained in an undisturbed bypass culvert under the surface facilities. Stream buffer zone markers have been placed at the disturbed area perimeter above the surface facilities and below the Mine site sediment pond where the stream exits the culvert.

Pace Canyon Mine

Stream buffer zone markers are in place along Pace Canyon Creek and adjacent to the side drainage at the undisturbed under-road culvert designated as PCUC-3 (See PLATE PC7-5, Chapter 7, Dugout Canyon MRP).

Refuse Pile

There are no stream buffer zone markers at the refuse pile site, as the drainage that may receive flow from the open channel spillway of the refuse pile sediment pond is ephemeral. To date, the refuse pile sediment pond has never discharged.

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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, sediment ponds, containment berms, water bars, 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. Sediment laden runoff from the disturbed areas is captured and directed to sediment ponds or sediment traps for treatment prior to leaving the disturbed area. The sediment traps in the main facilities area remove a high percentage of coal fines and sediment from the loadout area prior to discharging to the sedimentation pond. The design calculations for the sediment control structures are 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, all of the sediment control structures appeared to be capable of functioning as designed.

The Permittee recently submitted an amendment to remove a decant valve from the Mine site sediment pond primary spillway. Concerns of ice breaking the valve allowing a pre-mature discharge of unacceptable water was the reason for wanting to remove the valve. If it becomes necessary to remove water from this pond for whatever reason, a pump will be used to dewater the pond. The water quality of the pumped volume will have to meet UPDES standards prior to being discharged from the disturbed area.

Design calculations for the sediment pond are provided in Appendix 7-8 of the MRP.

Pace Canyon Fan Portal

Undisturbed flows collected by the adjacent watersheds are diverted through the fan portal disturbed area by undisturbed by-pass culverts and four water bars that will be located on the BLM road. Plans were approved to route the ephemeral side drainages through culverts PCUC-2, and PCUC-3. Total containment berms encircle the two topsoil piles and will hold all of the runoff from a 10-year, 24-hour precipitation event. Runoff from the operations pad will report to the sediment pond / trap when construction is complete. Silt fences between the relocated access road and Pace Creek remove sediment from the flow volumes before they leave

the disturbed area. Design calculations for the sediment pond / trap 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. Designed containment berms encircle the topsoil and subsoil piles; all of the runoff from a 10-year, 24-hour precipitation event will be treated via containment and evaporation.

Alternative Sediment Control Areas (ASCAs)

Dugout Canyon Mine

Plate 7-8, contained in the Dugout Canyon Mine MRP, identifies the areas utilizing alternate sediment control (ASCAs). Two ASCAs have been implemented in the field, and represent the Best Technology Currently Available (BTCA) in controlling sediment discharge from areas that do not report to an impoundment. One ASCA is located on the dam and outslope of the Mine site sediment pond. The others are located along the water tank access road above the main facilities area.

Pace Canyon Fan Portal

As previously mentioned, the fan portal disturbed area is still under construction. Plans provided in the MRP, Appendix 7-12, show that the disturbed area operations pad is contained within a berm to keep its intercepted runoff separate from the road. The road is a BLM road. The outslope of the road is stabilized with a rock wall. The Permittee has placed a silt fence below that structure to treat runoff reporting to it during the construction process. The silt fences will be evaluated after the vegetation in that area has had a chance to refurbish itself. The DOGM inspection process will determine if the fences must be kept in place for treatment, or may be removed.

Refuse Pile

Modifications are still being made to the refuse pile. Plate 7-1, as contained in the MRP, shows a topsoil stock pile and a subsoil pile. The Permittee states that these will be encircled by a berm. Plate RA7-1 does not clearly depict the location of these piles, however a watershed boundary is depicted. It is assumed that this watershed boundary is the same as the berm mentioned within the text. A berm is shown about the refuse pile which directs flow to ditches

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DD-2 and DD-3. These ditches report to ditch DD-4 that carries the collected flow to the sediment pond. All berms and diversions appeared intact during the midterm site visit.

RA PLATE 7-1 does not appear to be an “as-built” drawing, as the exact locations of the topsoil and subsoil piles are not depicted. The Permittee has submitted a proposed “as-built” of the refuse pile area as part of the Task ID #2156, Refuse Pile Expansion submittal. As of the date of this review, Task ID #2156 is still under review.

Siltation Structures: Sedimentation Ponds

Dugout Canyon Mine

Siltation structures in the main facilities area consist of two concrete sediment traps and a sediment pond. The concrete sediment traps are designed to remove in excess of 65% of all solids from the disturbed area runoff before the water enters the Mine site sediment pond. The sediment traps are constructed in series in disturbed ditches DD-3 and DD-4. The routed flow then reports to the main pond. These traps were implemented in order to reduce the sediment load reporting to the pond. Thus, the required cleaning frequency is reduced. The sediment pond will fully contain the runoff from the 10-year/24-hour storm event and will safely pass the 25-year/6-hour precipitation event through the emergency spillway. During the midterm site visit, the sediment pond was observed. The pond appeared intact and sound.

Pace Canyon Fan Portal

Canyon Fuel Company has implemented alternate sediment control measures to minimize erosion and sediment loading at the Pace Canyon fan portal. The methods to implement these goals will be achieved by using contemporaneous reclamation, placing clean gravel on operational areas / roads, maintaining silt fences, and routing pre-treated runoff to a sediment trap / pond. The sediment trap is the final treatment for disturbed area runoff that will report to Pace Creek. Hydrology calculations and sediment pond sizing calculations are provided in Appendix 7-12 of the MRP. The sediment trap is designed to contain the 10-year, 24-hour storm event (0.71 inches). The sediment trap’s primary spillway (PCDC-1) is designed to pass the 25-year, 6-hour storm event. The spillway consists of an 18-inch corrugated metal pipe for a maximum outlet velocity of 7.2 fps. As observed during the November 29th site visit, the construction of the sediment pond had not been completed. The oil skimmer on the PCDC-1 riser still needed to be installed.

Refuse Pile

The sediment pond located at the refuse disposal site is a total containment pond. Pond sizing calculations are provided in Appendix 7-12. This pond contained water and appeared to be functioning as designed during the midterm site visit evaluation.

Findings:

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

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 problem can be resolved through the inspection process.

R645-301-731.720, Disturbed Area Diversions; the Permittee needs to submit a revised Plate 7-5 depicting the locations of the two sediment traps in ditches DD-3 and DD-4, Dugout Canyon Mine main facilities area.

RECOMMENDATIONS:

The Permittee must address the deficiency relative to **R645-301-731.720**