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State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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November 14, 2002

TO: Internal File

THRU: Mike J. Suflita, Environmental Scientist III/Team Lead

FROM: Priscilla W. Burton, Environmental Scientist III/Soils

RE: James Canyon Road, Canyon Fuel Company, LLC, Skyline Mine, C/007/005-AM01K-2

SUMMARY:

In-mine flooding created an urgent need for dewatering wells in James Canyon. Two wells were drilled in August of 2001 in James Canyon for this purpose (page 2-63a). In October 2001, the Permittee provided the Division with sketchy submittals for the emergency construction and implementation of the dewatering well site (AM01H and IB01I). Although the information was not complete, the Division approved of the activity in letters dated September 28, 2001 (AM01H) and October 23, 2001 (IB01I). An "as built," submittal containing information for the burial of cable and pipeline and development of the well site, 9.65 acres in all was received on November 15, 2001.

The as-built information updated sections in Chapter Two of the Skyline Mining and Reclamation Plan to include:

- Permanent burial of a sixteen-inch diameter poly pipe for a distance of 3,000 feet from a well site in James Canyon (within the permit area) down to Electric Lake. The buried pipeline discharges groundwater to Electric Lake. The trail in which the pipe is buried has been reclaimed and at final reclamation, the only disturbance will be to plug both ends of the pipe with cement (see also AM01H).

- Permanent burial of power cables along the Forest Service Road, FDR-018, from the Questar Gas building to the permit boundary in James Canyon (2.95 acres) and down James Canyon Road to the well site (0.3 acres) as shown on DWG. No.: 1.6-3, Skyline Mines Permit Area (see also IB01I-1).

- Construction and reclamation of the drill site.

A follow-up application was received on July 8, 2002 responding to deficiencies in the application as noted in the Technical Analysis dated April 1, 2002. The Division itemized deficiencies with the second application in a Technical Analysis dated October 10, 2002.

A third application was received on October 28, 2002. This review covers outstanding issues such as the effect of mine water discharge on the alluvial valley floor downstream of the mine site in Pleasant Valley and reclamation and stabilization of surface areas at the James Canyon drill site.

TECHNICAL ANAYLSIS:

ENVIRONMENTAL RESOURCE INFORMATION

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

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:

In a telephone conversation on October 5, 2001, with Gary Taylor, Environmental Coordinator for the Skyline Mine, I verified that for the stretch of Forest Service road outside of the mine's disturbed area boundary and to the James Canyon well site:

1. There was no topsoil.
2. There was no topsoil salvage.
3. There was no topsoil redistribution.

Consequently, soil survey information provided in Appendix 2 of Chapter 2 is for the half-mile section of reclaimed road in James Canyon where the 16-inch poly pipe has been buried and for the well site. Mr. Dan Larsen, Soil Scientist, with EIS Environmental and Engineering Consultants, Helper, Utah, September 2001, has provided a soil description and field notes for the well site location, and brief notes for the rest of the reclaimed road, supported by hand-dug excavations. Laboratory analysis was conducted on five composite samples collected from soil representing each of the identified soil types and the stockpiled topsoil and subsoil at the well site.

The survey indicates that soils supporting the Aspen/Grass/Forb vegetation type (A) had a topsoil layer that was 16 – 24 inches in depth, very dark brown color and a texture of sandy loam or loam with a granular structure. The subsoil had 15 – 30 percent rock fragments in the fravel and cobble size and was brown to yellowish brown in color, 20 – 40 inches thick. Below this, a dark grayish-brown to brown clay loam soil with blocky structure was encountered. These are Pachic Palecryolls and Pachic Haplocryolls.

Soils supporting sagebrush (S) were found at the lower elevations and were generally loam soils with a brown topsoil horizon of 6 – 12 inches in thickness. The soils were formed from sandstone and shale with deeper subsoils (to forty inches) forming in the colluvial deposits. Generally, these soils are more shallow than the soils that support aspen growth.

An inclusion of calcareous tufa (T) was identified for a 100 feet along the pipeline route, near a spring, approximately ¼ southwest of the drill pad. The Tufa soils had the following characteristics: a 7 – 12 inch dark brown surface layer overlying white subsoil grading to rock at about 20 – 24 inches.

Productivity information for James Canyon is found in Section 2.12 Land Use Attachment 3 Eccles and Mud Creek Work Plan. A grass/forbe community at the head of coal canyon was evaluated by Robert Thompson, Botanist, U. S. Forest Service. The site had a high production rate of 2,910 lbs/acre and was classified as Fair condition.

Findings:

The information provided is adequate for the Environmental Soil Resources Information 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 Division's March 1984 Technical Analysis written for the Valley Camp Mine (ACT/007/001) provides a summation of the history of the alluvial valley floor determination. In 1984, the Division stated that Whisky Canyon and Pleasant Valley above the Utah No. 2 facilities (White Oak Load Out) were observed by the Office of Surface Mining in August of 1983 to be too narrow for flood irrigation or subirrigation agricultural activities. Also in 1984, it was noted that the pastures below the Utah No. 2 Mine (White Oak Loadout) are flood irrigated and the grasses on the valley bottom may be subirrigated. In the Valley Camp MRP, Map R645-301-411.100 Premining Land Use Map shows the land use down stream of the Belina Mine

Complex. Shown on this map, are two pastures along Mud Creek in Pleasant valley below the Utah No. 2 Mine (now called the White Oak Load Out).

Since August 2001, the Skyline Mine has been discharging approximately 10,000 to 15,000 gpm (approximately 20 - 25 cfs) into Eccles Creek. The discharge rate has currently stabilized at 9,200 gpm (20 cfs, July 2002 Addendum to the PHC). These waters flow down Eccles Creek and then to Mud Creek. Mud Creek flows through Pleasant Valley, an alluvial valley floor.

The historical record of flow in Mud Creek is graphed in Figure 2.12.C, as recorded at the USGS station just downstream of the confluence with Winter Quarter's Creek. Ordinarily, high flows of approximately 100 – 150 cfs occur for a short duration during the months of May and June. Flows quickly subside after snow melt back to the baseline flow of approximately 6 – 12 cfs. According to Section 2.12, the highest daily mean flow during the period from 1974 – 2002 was 384 cfs during the month of May 1984. The lowest daily mean flow was 1.6 cfs during January 1980. The mine water discharge is constantly contributing an additional 20 cfs to the baseline flow. i.e. 2 to 3 times the normal base flow. Mine water discharge will decline over the next two years to approximately 2,800 gpm (5cfs) (Appendix F of the October 2002 Addendum to the PHC).

Measurements of flows taken on November 26, 2001 (Appendix D) recorded 18.4 cfs in Mud creek after the confluence with Eccles Creek (station MW1) and 24.44 cfs after the confluence with Winter Quarters Creek (station MW3). The gain in flow downstream is attributed to contributions from springs and side streams (2 – 3 cfs) and re-emerging base flow from the alluvium of 3 – 4 cfs (Section 2.12 and Appendix D July 2002 Addendum to the PHC).

The mine waters being discharged had an average Total Dissolved Solids (TDS) level of 600 mg/L in July of 2000. With continued pumping, the concentration of TDS has decreased to less than 400 mg/L as of March 2002. Above the mine, the average concentration of TDS is 300 mg/L (July 2002 Addendum to the PHC).

Cross sections of the channel were measured at six different stations shown on Figure 2.12B Valley Cross Section Location Map and Attachment 1 Land Use of Section 2.12. The piezometric surface was measured at four of those stations. In the vicinity of Green Canyon, the groundwater is four feet below the surface (Station 7300). In the area of Station 14480, on Mr. Radakovich's property (Figure 2.12.D Farm Location Map), the groundwater level is eight feet below the surface, reflecting the incised nature of the stream channel in this section of Mud Creek. The ground water rises back up to four feet below the surface at Station 17340 on Mr Jensen's property.

Station 17340 is located at the site of an irrigation diversion. As a result, the depth to groundwater at a point 400 feet distant from the stream is closer to the surface than that along the stream channel, due to irrigation return flow as well as stream channel entrenchment.

Land along Mud Creek is owned by four landowners (Drawing 1.6-1 Surface Ownership and Table 2.12.3). The land is used for grazing. Figure 2.12 D of Section 2.12 provides a location map for the pastures along Mud Creek. Ray Jensen, Range Specialist for the Bureau of Land Management (BLM) describes the area as sub-irrigated, grazed land with an historical yield of 4000-6000 pounds/acre. The predominant vegetation type is grass. The number of animals grazed on the pastures by each land owner is variable with time. Table 2.12.4 shows the number of animals grazing on each parcel in July 2002.

The Permittee has evaluated the value of the pasture ground in terms of the replacement cost for feed (Section 2.12). At a consumption rate of 0.5 Tons/mo and a cost of $100/Ton hay, the replacement cost is #50/animal/month. The replacement of feed is not likely however, since the Permittee has shown that grazing will not be impeded due to high flows along Mud Creek and reduction in the area available for grazing is limited to the immediate vicinity of the channel banks which may become instable and collapse as they are eroded by the high water.

Mud Creek stream channel vegetation was assessed in December 2001 by Dr. Patrick Collins of Mt. Nebo Scientific (Appendix A of Appendix D July 2002 Addendum to the PHC). A level II investigation was conducted using the methods of the USDA Forest Service. Two reaches were located on Mud Creek. Just below the confluence of Eccles and Mud Creeks at Reach #4 (corresponding to MW1), the riparian community was approximately 91 feet wide and consisted of willows, sedge and rush grasses. Using a qualitative measure, approximately 80% of the bank in Reach #4 were vegetated and stable. Downstream, at Reach #5 (corresponding to MW3), the width of the riparian community broadened to 120 feet and consisted mostly of willows growing in both riparian and wetland communities. Approximately 60% of the bank was vegetated and stable. Channel vegetation was not assessed between MW1 and MW3, a distance of approximately 4 stream miles. "Observations of this section between MW1 and MW3 from the road are that willows and grasses that extend to the edge of the active channel in reaches up and downstream area generally absent from this section" (February 27, 2002 EarthFax report in Appendix D of July 2002 Addendum to the PHC).

The gradient of Mud Creek is approximately 0.0091 ft/ft with a sinuosity ratio of 1.6 (as stated on page 2-133d of Section 2.12) The figure was derived from aerial photographs (personal communication Rich White, Earth Fax Engineering, November 15, 2002). The channel flattens on approach to Scofield Reservoir with an average gradient of 0.02 to 0.1 ft/ft. Channel subsoils are silty sands and clayey silts, classified by the 1988 Carbon County Soil Survey as Silas and Silas Brycan series. The results of laboratory analysis on the physical properties of the soils in the creek are found in Appendix B of Appendix D of the July 2002 Addendum to the PHC. The roughness coefficient (Mannings "n") is a low value around 0.03 or 0.04 (Appendix D of the July 2002 Addendum to the PHC), indicating a soft channel bed. Cross sections of the channel describe a channel bed that is 96% cobbles and gravels and side slopes that are 100% sand, silt and clay (Appendix E of Appendix D of the July 2002 Addendum to the PHC). Low flow terraces are limited in extent and the channel is slightly incised. There is no broad flood plain.

The current stream flows do not approach natural bankfull discharge (Table 5 of Appendix D July 2002 Addendum to the PHC). The erosional stability of the Mud Creek channel beds and banks was evaluated and found to fall within the allowable-velocity using the techniques of evaluation described by the Soil Conservation Service (Table 3 of Appendix D July 2002 Addendum to the PHC).

A stability evaluation of the channel concluded that well vegetated slopes (grasses and willows) can handle the increased flow with out erosion (Appendix D of the July 2002 Addendum to the PHC). There are channel banks of Mud Creek that are not well vegetated and the Division would encourage landowners of these lands to avail themselves of programs that would provide assistance to armor the bank and divert flow to allow the eroding banks an opportunity to reclaim. The Permittee expressed a willingness to help in this effort (see field visit report and associated photographs dated October 29, 2002). The Division is facilitating a meeting with the Natural Resources Conservation Service and the landowner for this purpose. The July 2002 Addendum to the PHC (page PHC A-21) commits to armoring stream channel banks, planting of stream bank stabilizing vegetation or redirection of some flows should monitoring reveal that deterioration of stream chemistry or stream morphology or vegetative community is related to mine water discharge.

In conclusion, the Division recognizes that the impact to Mud Creek from the increased flows, is not the interruption of agricultural activity, but could be the acceleration of instability in the channel banks and increased erosion of the stream channel in reaches of the channel that are not well vegetated. The area impacted would be very small in relation to the acreage being pastured and would be negligible to the total production of the pastures.

Scofield Reservoir is a drinking water source for Price, a top cold water fishery in the State and has been listed as an impaired water body by the EPA. Of special concern is the concentration of total phosphorus in the reservoir (Appendix E of the July 2002 Addendum to the PHC). A significant source of phosphorus pollution in the Scofield Reservoir is the sediments entering the reservoir delivered by Mud Creek. Using the information in the Division's Water Quality Database for TSS and flow at sample locations C6 on Eccles Creek, VC9 on Mud Creek and VC1 on Mud Creek, the average sediment yield carried by Eccles and Mud Creek prior to 1999 was 2,710 Tons/yr. The average sediment yield carried by Eccles and Mud Creek between 1999 and 2002 has been 2,908 Tons/yr. This translates to an increase of 7% annually.

Consequently, the contributions of mine water to the increased phosphorus loading will be evaluated in the monitoring plan proposed by the Permittee (Section 2.12 Attachment 3). Monitoring at two sites on Eccles and five sites on Mud Creek will include: total flow, TDS, TSS, and total phosphorous, stream morphology. (Station locations are shown on Figure 1 Location of Reference Sites Attachment 3 Land Use of Section 2.12.) Stations will be monitored four times a year (seasonally) and for a period of one year following a reduction in discharge to a rate of 350 gpm or less. Sediment yield loading from flows in Mud Creek will be computed from the TSS and flow data collected. Annual evaluations of the stream will be summarized in a

report to be submitted to the Division with the Skyline Mine Annual Report. The monitoring plan will also evaluate the changes in stream morphology and vegetation at the stations over the same time period. The Study Plan prepared by Dr. Patrick Collins on July 4, 2002 entitled "Continuing Studies of the Effects of Increased Flows on Riparian Communities at Eccles Canyon Creek & Mud Creek," is included in Attachment 3 of Section 2.12. This Level III assessment of the riparian communities of Eccles and Mud Creeks will be conducted for two years beginning in 2002 and being completed in 2003, with fieldwork being conducted in July and August.

Findings:

In accordance with R645-302-323.122, the Division finds that the Skyline Mine operations have not materially damaged the underground water systems in Pleasant Valley, which is outside the permit area of the existing coal mining and reclamation operation. The Division finds that there has been no significant impact to productivity of the pasturelands in Pleasant Valley. The Division finds that the quality of the mine water discharge in terms of Total Dissolved Solids has improved with the quantity of water discharged. No conclusive information on the Phosphorus contributions of sediments carried by the Mud Creek waters is available at this time.

In accordance with R645-302- 324.300, The Division has required continued monitoring of the vegetation, erosion of banks, flows and chemical quality of the waters at established locations on Mud Creek.

OPERATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

Drill Site

Drawing #1.6-3 shows the site location. Plate #3.4-1 shows the location of the well site and topsoil storage pile along the road.

Development of the well site is described on page 3-63 (a). The site includes a drill pad (100' X 200'), sediment pond, undisturbed drainage ditch and 18 inch culvert. Two water wells were drilled, JC-1 and JC-2. Topsoil was removed to a depth of two inches (on the average) from the drill pad area (page 2-120 (f).

The soil survey (Appendix 2) reported that in the vicinity of the well site, the access road and the pipeline burial roadway, the topsoil was between 16 and 24 inches in depth (Aspen soil). However, only an average of two inches was salvaged from the drill pad and access road, yielding a total of 126 cubic yards of topsoil that is stored at the intersection of James Canyon Road and the Monument Peak Road (Drawing 3.4-1). The Permittee indicates that drill pad and access road were constructed on a previously disturbed road cut (page 2-120f) and therefore salvage of more than two inches was not possible. This information is not supported by the consultants report found in Appendix 2 and repeated on page 2-120 g. But, if this information were accurate, then R645-301-232.300 would have allowed salvage of six inches of topsoil/subsoil where topsoil was inadequate.

The reclamation plan describes the replacement of two inches of salvaged topsoil to the site (Section 4-20, page 4-30 (a)).

Pipeline

The 16-inch polypipe is buried for a distance of about a half mile along the James Canyon road from the drill site to the dewatering site at Electric Lake in Section 35, T.13S, R6E.

For polypipe burial, the plan indicates that the top few inches of soil on the flat portions of the road (page 2-120 j) were salvaged and the subsoil was removed to a depth of three feet and replaced.

The pipeline was reclaimed in September 2002 (page 4-30(b)), no mulch was incorporated into the surface.

Power Cable

The power cable is buried in the road in James Canyon in the SW1/4 SE1/4 of Section 25, T13 South R6 East. The present configuration of the road is 19 feet wide with ditches on both sides. The ditches have 1:1 side slopes. There is four inches of road base on the roads (IB01I-1). The power line was buried 30 – 40 inches deep, in an eight inch wide trench (page 2-120 j). Power cable was laid in the bottom of the trench and the trench was backfilled.

The buried power line runs from the power pole for a distance of 4,400 feet along the James Canyon road (page 3-63a)) to the well site (a total distance of approximately 1.2 miles). DWG 1.6-3 indicates that a portion of the James Canyon road was not initially in the permit area, but was incorporated into the permit area as a result of this activity.

Stipulations were placed on the power cable installation and burial by the U.S. Forest Service in a letter to Mary Ann Wright of the Division, dated October 15, 2001, signed by Elaine Zieroth, Forest Supervisor. For the portion of the power cable burial falling within the mine permit boundary, the following soils issues were stipulated by the Forest Service:

- Typical details showing the depth of burial and trench relative to the road
- Plan for protecting the topsoil berm an the outer edge of the road and
- Seeding of the topsoil berm and cutslope of the road prior to winter.

The submittal describes the trench on pages 3-28 (b) through 3-28 (e). Page 4-30 states, "soil was removed from the road surface and pushed to the side for use as a temporary berm." The topsoil was stored in a berm approximately two feet four inches high (as shown in cross-sections on pages 3-63 c –f) along the outslope of the road. As described on page 2-120 (f) and 2-63 (b), the outslope of the road was protected from erosion by reseeding with the seed mix shown on page 2-63 (e). During reclamation of the road (page 4.30a) the berm will become the topsoil, so protection during operations is quite critical.

Findings:

The information retroactively provides the Operations Topsoil and Subsoil handling information for the James Canyon pipeline emergency construction, where two inches of topsoil was salvaged from the drill pad and none from the pipeline burial. The soil survey (Appendix 2) reported that in the vicinity of the well site, the access road and the pipeline burial roadway, the topsoil was between 16 and 24 inches in depth (Aspen soil). If conditions were not as described in the soil survey, the Permittee should have salvaged six inches of topsoil and subsoil at a minimum according to R645-301-232.300.

RECLAMATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

Analysis:

Redistribution

The reclamation plan for the James Canyon Road and Drill Pad is outlined on page 4-30a:

- The topsoil (berm) will be "set aside."
- The gravel road surface will be pushed to the inside of the road cut.
- The road outslope of the road will be pulled up onto the road.

The average depth of topsoil and subsoil replacement is as follows (page 4-30 (a) & (b):

Drill pad = 2.0 inches

Pipeline = 0

Powerline = use road berm

Staging area (topsoil pile location) = use subsoil on outslope

There is very little topsoil being replaced at the site, although the area was rich with topsoil prior to disturbance (see Appendix A-2).

The reclamation plan is described on page 4-30(a & b). The road will be ripped to a depth of four feet to reduce compaction. The plan calls for pushing the gravel on the surface of the road to the cut slope side; filling the cut with outslope material; and topping the surface with the soil stored in the road berm.

The Division requested that there be no compaction in the upper four feet of the root zone. The Permittee has indicated that compaction will be kept to a minimum during soil placement on the road and that the site will be gouged to 18 inches depth (page 4-30(a). The reclamation plan should include ripping the road surface prior to restoring the contour.

Since two inches of topsoil was salvaged from the site reported to have between 16 and 24 inches in depth, reclamation of the drill pad and access road will be enhanced with supplemental organic matter, such as Biosol. The type of organic amendment will be determined in cooperation with bothe the U.S. Forest Service and the Division prior to reclamation of James Canyon.

Findings:

Information provided with the submittal is adequate to ensure an adequate rooting zone

STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

Analysis:

Page 2-120 (j) states that the James Canyon road was roughened from the drill site down to Electric Lake with gouges made by a track hoe. Along the pipeline, water bars were re-constructed and silt fences were positioned at the outflow of each water bar (page 3-63 b). The grading was completed by September 14, 2001 and the site was seeded sometime in November 2001 (page 4-30 (b)). The seed mixture is found on page 2-63(e).

Reclamation of the access road and drill pad will also include surface roughening to 18 inches and placement of logs and rocks on the surface. Water bars will not be left on this portion of the road (as per Section 4-20, attached email communication from Carter Reed USDA Forest Service to Chris Hansen Canyon Fuel Company, dated July 3, 2002).

The James Canyon road disturbance is in ASCA #35 and #36 (page 3-72 C). As such, silt fences will be maintained three times a year until vegetation is adequate to control erosion (page 3-64).

Findings:

Information provided meets the minimum requirements of Reclamation Plan Stabilization requirements of the Regulations.

RECOMMENDATION:

The submittal is recommended for approval and incorporation into the MRP.

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