



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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July 8, 1992

TO: Daron Haddock, Permit Supervisor
FROM: James D. Smith *JDS*
RE: Mid-Term Technical Deficiency Review of Permit,
Valley Camp of Utah, Inc, Belina Mines,
ACT/007/001, Folder #2, Carbon County, Utah

SUMMARY:

Valley Camp of Utah, Inc. has submitted information to satisfy the requirements of R645-301 for permit renewal. This is a technical deficiency review of information submitted to satisfy the requirements of R645-301-600. Geology. and portions of R645-301-700. Hydrology.

R645- Natural Resources; Oil, Gas and Mining; Coal.

R645-301-600. Geology.

R645-301-622.100.

Proposal:

The Permittee considers the drill hole logs shown in Figures R614-301-622.100a through 622.100g as confidential information.

Analysis:

According to R645-300-124 only information on physical and chemical properties of the coal may be made confidential, subject to restrictions and procedures given in the Rules. Information on coal seams, test borings, core sampling, or soil samples will be made available to any person with an interest that is or may be adversely affected, as such a person is defined in the rules.

Deficiencies:

1. The Applicant shall remove the statements about confidentiality of the bore hole logs from the MRP. The Permittee may request that certain information in other

parts of the MRP be held confidential, but the procedures in R645-300-124 should be followed.

623 and 624. Geologic Information ...Determining all potentially acid- or toxic-forming strata ...reclamation ...subsidence control plan ...borings or drill cores ...lithologic characteristics ...ground water ...thickness and engineering properties of clays.

Proposal:

The Permittee states on page 6 there is no data on the rock units above, between, and below the coal seams at the Belina Mines. Limited sampling and analysis of substitute topsoil material have been done at the mine pad and loadout areas and results are given in Table R614-301-623.100. Section R614-301-624.320 identifies to these analyses as representative of the coal seam and floor and roof strata. The Permittee also refers to information on rock sampling and testing found in the MRP of the adjacent Skyline Mine to partially satisfy data requirements.

Based on available data, the Permittee concludes there are no strata involved in the coal mining activity that are potentially acid- or toxic-forming. The Permittee also concludes, based on information from the Skyline MRP, that strata below the minable coals are of variable lithology, with clay content ranging from 5% to 100%, and that the roof strata are slightly alkaline and of low sulfur content.

The Permittee states on page 13 that analyses of coal seams, which are or have been mined, are given in Section R614-301-623.100. To better document the acid- and toxic-forming potential of the coal at the Belina Mines, the Permittee commits on page 6 to have the coal that is shipped from the Valcam Loadout sampled and analyzed biannually.

On page 9 of the MRP the location of drill hole 74-24-4 is given as SW quarter of the SW quarter of Section 24, T13S, R6W, SLBM and Map R614-301-622.200f is given as the cross section where the log from that bore hole is displayed. The Flat Canyon coal seam and overlying Aberdeen Sandstone are described based on this bore hole.

Analysis:

Soil analysis summaries in Table R614-301-623.100a do not include selenium or ABP. The original data sheets in Appendix R614-301-623.100 have analysis results for selenium and ABP for TH-1, TH-2, and TH-5 and ABP for UT-1, UT-2, and UT-3. A letter dated September 16, 1986 from James S.

Leatherwood, a soils reclamation specialist, indicates materials from these two sites are suitable for use as substitute topsoil. Analysis results for the other two locations, BP-1 and BP-2, show extremely high boron, copper, and sodium levels and erratic calcium values; perhaps these extreme values indicate either analytical error or use of an analytical procedure that yields results not comparable to those from the other six samples. Mr. Leatherwood's letter does not remark on these last two sample locations.

The Permittee refers to the Skyline Mine MRP for the analyses of acid- and toxic-forming materials in rock and coal and of thickness and engineering properties for strata immediately above and below the coal seams to be mined. The Skyline MRP (PAP) was found deficient on data covering these same points during the last permit renewal. Following are comments from the last Technical Deficiency Review of the Skyline Mine MRP.

In 1979, 24 roof and floor core samples from exploratory borings were analyzed for potential acid-forming material. Samples were taken for the roof and floor of each of the three seams to be mined. The samples were analyzed using methods different from those currently recommended by the Division. ... Clay content of floor rock has been determined non-analytically as ranging from less than 5% to 100%. Clay content and other properties for roof rock are not mentioned.

Analyses for potential acid-forming materials are 12 years old, taken from material obtained from exploratory boreholes. Neither the laboratory nor the analytical methods are identified. Analysis was not done for toxic-forming materials. Locations where cores used in the analyses were taken are not given. ...

As mains and entries are advanced in preparation for coal extraction, it is common practice to sample roof and floor material for determination of geotechnical and geochemical properties. Analyses of such samples that have been obtained over the past 12 years should be included in the PAP and used to update the determination for potential toxic- and acid forming materials and for pillar strength and subsidence determinations. Elevations and locations of samples should be on a map and other information, such as water inflows, lithology, and geotechnical properties should be mapped, tabulated, or discussed at an appropriate place in the PAP.

Non-analytical methods for determining clay content, thickness, and engineering properties of roof and floor rock are not described, and the techniques for incorporating these data into the subsidence and pillar strength determinations are not given in Section 4 of the PAP.

Recent analyses of waste rock have been done with methods following the Division's "Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining". Waste rock analysis done on 5/5/87 show that potentially acid forming rock was encountered in the mine. Samples analyzed on 5/5/87, 7/20/70, and 8/27/91 have elevated boron levels.

No analyses of coal are located in Sections R614-301-

623.100 or R614-301-624.330 of the MRP and none are found in the annual reports.

Bore hole 75-24-4 is shown in the SE Section 24, T13S, R6W on Map R614-301-622.100a, not in the SW as stated in the MRP. The log is displayed on Map R614-301-622.200g, not R614-301-622.200f. The bore hole is not shown as penetrating to the Star Point Sandstone and the Flat Canyon coal is not shown resting on the Star Point Sandstone as described in the text.

Deficiency:

1. The Permittee shall make an appraisal of the extreme values for boron, copper, and sodium in samples BP-1 and BP-2. Technical data submitted in the MRP shall be accompanied by descriptions of the methodology used to collect and analyze the data.

2. The Permittee shall use current data from analyses of roof and floor samples in making a determination of potential toxic- and acid-forming materials and shall incorporate this information into the determination of the PHC.

3. The Permittee shall use current data in determining the thickness and engineering properties of clays of soft rock such as clay shale in strata immediately above and below each coal seam to be mined. Technical data submitted in the MRP shall be accompanied by descriptions of the methodology used to collect and analyze the data.

4. The Permittee shall analyze coal from the Valcam Loadout for acid- and toxic-forming materials in 1992 and report the results in the 1992 Annual Report.

5. The Permittee shall correct the text and maps as necessary to indicate the accurate location of bore hole 75-24-4 and of the bore hole log cross section. The stratigraphic relationship of the Flat Canyon coal seam and associated strata to the Star Point Sandstone, described on page 9 and shown on Map R614-301-622.200g, needs to be clarified.

R645-301-632. Subsidence Monitoring

Proposal:

Subsidence monitoring is done by annual pedestrian survey to document the surface evidences and effects of subsidence. The Permittee states on page 17 that no surface effects of subsidence have been found over areas where pillars have not been pulled nor where overburden above the

mined coal is greater than 350 to 400 feet thick. On page 31 of Section R614-301-700 this is stated more specifically as no such effects were observed in the August 1983 survey.

Analysis:

Comparison of the subsidence monitoring map, Map R614-301-728.100a, with the overburden thickness map, R614-301-622.200a, shows sinkholes and cracks caused by subsidence have been found above mined areas accessed from the 2nd and 3rd East and 3rd West Mains where overburden thickness is 500 to 900 feet.

Deficiency:

1. The Permittee shall correct or clarify statements in the MRP that no surface effects of subsidence have been found where overburden thickness is greater than 350 to 400 feet.

R645-301-700. Hydrology.

R645-301-722.100. Location and extent of subsurface water

Proposal:

Areal and vertical distribution of aquifers is presented in Sections R614-301-600 and R614-301-722.100. The contour map of the potentiometric surface, Map R614-301-722.100c, is based on 1980 data. Current data are not available due to well abandonment and inaccessibility to any remaining wells. Portrayal of seasonal differences in head in different aquifers cannot be shown as there is insufficient data. There is no ground water data for the Valcam Loadout Facility.

Most ground water information comes from seeps and springs, which were inventoried in 1978-79 and in 1990. Seep and spring locations are on Map R614-301-722.100b. Seep and spring information indicates a 33% decrease in flow between 1979 and 1990, which is attributed to declining precipitation; however the majority of the seeps and springs are still perennial.

Analysis:

The potentiometric map has not been updated to show the effects of ground water flow into the mines and of seasonal variation. Areal and vertical extent of aquifers and location of ground water at the Valcam Loadout is not included in the MRP. Map R614-301-722.100b does not show

any seeps or springs around the Valcam Loadout.

Decreased flow of seeps and springs is attributed to decreased precipitation, but there is no precipitation data to support this conclusion. See the related discussion and deficiency in Section R645-301-724.400 below.

Deficiency:

1. The Permittee shall determine areal and vertical distribution of aquifers and the location and extent of ground water at the coal loadout and shall show this information on appropriate maps and cross sections. This should include at a minimum a spring and seep inventory for this area, and installation of ground water monitoring wells or piezometers if needed to obtain the information.

2. The Permittee shall update potentiometric surface maps to show long term impacts due to mine water inflow or other long term factors and, if data are sufficient, seasonal variations.

R645-301-722.400. Location and depth, if available, of water wells

Proposal:

Locations of the two culinary water wells in use are shown on Map R614-301-724.100a. Two other culinary wells were drilled but have been sealed. There are five piezometers on the adjacent Skyline Mine property that provide some indication of aquifer and ground water characteristics in the Valley Camp permit area.

Analysis:

Locations of the two active culinary wells are shown: locations for the abandoned wells are not shown. Depths and other information on the water wells, such as water levels, production rates, and borehole logs are not in the MRP. Even though two of the wells are sealed, there should still be data available about their construction and hydrogeologic setting. Utah Fuel also has two water wells in Eccles Canyon that are not identified on any map or documented in the MRP.

No well logs, depths, or other information are given for the five piezometers on the Skyline property.

Deficiency:

1. If available, depth of both the active and abandoned culinary water wells, including Utah Fuel's,

should be shown on a map or cross section or given at an appropriate place in the MRP. Any other information on the ground water or hydrogeologic environment should also be given. Similar information should be provided for the five Skyline piezometers, if it is available.

R645-301-724. Baseline Information.

Proposal:

The Permittee obtained water rights information from the State Division of Water Rights in 1990. The printout is in Appendix R614-301-722.100c and the information is displayed on Map R614-301-724.100a. Usage is summarized on Table R614-301-722.100a.

The Permittee has monitored ground water quantity and quality quarterly, some of the data going back to around 1977. Data from the seven springs currently being monitored are summarized in Table R614-301-724.100b. Accessibility varies; there is one first quarter sample from one spring and no other first quarter samples.

Surface water quality and flow have been monitored at some locations since approximately 1964, and the data from the seven stations currently being monitored are summarized in Table R614-301-724.200a. The operator has noted little to no variation in surface water quality during construction and operation of the mine.

Mine water from active mines is discharged through sediment ponds, water from abandoned mines is discharged through a 6 inch pipe directly into Whiskey Creek. The NPDES permit for the mining operation is in Appendix R614-301-750. The current permit expires July 31, 1992.

The Permittee identifies Boardinghouse, Upper Huntington, Eccles, and Mud Creeks as perennial streams in the local area. Whiskey Creek is perennial below the point where water from the abandoned mines is discharged.

Table R614-301-722.300b lists surface and ground water monitoring stations that have been abandoned, along with the reason for the abandonment.

Analysis:

Discrepancies were noted between data from tables and maps and the text of the MRP: 1) the last paragraph on page 13 states the highest average TDS is 384 ppm from spring S24-12 during the 3rd quarter; table R614-301-724.100b indicates it is 374 ppm and from the 4th quarter. 2) 4th quarter TDS values for spring S31-13 have been omitted from

Table R614-301-724.100b. 3) TDS values for VC-10 and for the second quarter for VC-11 in Table R614-301-724.200a do not match those on Map R614-310-722.100a.

Water discharged through the 6 inch pipe directly into Whiskey Creek from abandoned mines is also subject to the NPDES permit even though it is not required to pass through the sedimentation ponds. Language on pages 18 and 19 could be understood to mean the abandoned mine discharge is not subject to the NPDES permit. In addition to water quality analysis, quarterly biological monitoring using ceriodaphnia and fathead minnows is required by the NPDES permit. Recent analysis and biomonitoring have not indicated any problems.

In addition to the perennial streams identified by the Permittee, Burnout Creek has been identified as a native cutthroat trout hatchery and is being studied by Coastal States Energy and the USFS to determine if it is perennial along any part of its channel. Perennial flow, if it exists, probably does not extend into the Valley Camp permit area, but impacts of the proposed mining on sediment yield, streamflow alteration, water quality, water availability, or other characteristics of the Burnout Creek drainage could result in adverse impacts to the hydrologic balance and loss of a renewable resource.

Deficiency:

1. The Permittee shall correct or clarify the discrepancies noted above between the text and data on maps and in tables.

2. The Permittee shall clarify that direct discharge from abandoned mines into Whiskey Creek as described on pages 18 and 19 is included in the NPDES permit and subject to that permit's limitations. Include a discussion of the biomonitoring requirements of the NPDES permit.

3. The Permittee shall forward as soon as possible a copy of the new NPDES permit to DOGM and to other state, federal and local agencies that are involved in MRP review and comment.

R645-301-724.400. Climatological Information

Proposal:

Average annual precipitation, wind conditions, and temperature variations are given based on regional or statewide reports and the national weather service gauge in Eccles Canyon. Seasonal variations are given in general terms.

Analysis:

At several places in the Hydrology Section, such as pages 5 and 30-31, it is stated that variations in spring and stream flow are correlatable with increases and decreases in precipitation. There are no data in the MRP on annual or seasonal precipitation variations on which to base such a statement. Climatological data have been included in some Annual Reports, but it has not been consistent and there is no presentation of mine site climatological information in the MRP.

The MRP is to contain current information, and referenced materials are to be provided to the Division if they are not readily available. Climatological data from the mine site or the national weather service Eccles Canyon precipitation gauge would be the best to make the comparisons of spring and stream flow to precipitation. Without local data, information such as that available from the national weather service for the county or region might be sufficient.

Deficiency:

1. The Permittee shall include in the MRP sufficient data on seasonal and annual precipitation for the mine site or the surrounding area to substantiate the conclusion that variations in spring and stream flow correlate with variations in precipitation.

R645-301-728. Probable Hydrologic Consequences (PHC)

Proposal:

The Permittee predicts that both short and long term effects from mining to ground and surface water quality and quantity will be minimal. The Permittee anticipates less than 1% of flow will be diverted from the Huntington Creek drainage to the Mud Creek drainage. Effects on water rights are expected to be minimal also, but the Permittee has several options to mitigate problems. After reclamation and abandonment of the mines, the ground water system is expected to return to its premining equilibrium.

Spring depletion has been measured annually since 1980. The Permittee attributes a recent uncharacteristic decline in spring flows to decreasing precipitation. Seep and spring surveys done in 1979 and 1990 indicated old springs drying up and new springs appearing. A spring at the Valcam Loadout had a significant decrease of flow in 1977, but flow was back to normal in 1990. The Permittee commits to continued seep and spring surveys to follow up on those done in 1979 and 1990.

Water quality is affected by sediment or salt loading, chemical or acid contamination, alteration or diversion, and increased or decreased flow. Increased suspended solids come from construction, reclamation, and surface effects of subsidence. Structures, impoundments, and diversions reduce erosion and control most of the solids. All coal mine wastes are disposed of underground. No toxic- and acid-forming materials have been identified at the mine, and the Permittee commits to have the coal analyzed regularly. Seasonal variations of flow and sediment and chemical loads have been documented

Up to 422 gpm and as little as 22 gpm of water has been discharged from the mines, but no flows of more than 5 gpm and persisting more than 30 days have been found within the mine. Suspended sediment and oil and grease are removed in sedimentation ponds. Evaporation, water produced with coal, and in mine use consume up to 45 gpm.

The Permittee commits to protect perennial streams identified in the PAP from subsidence by no second mining beneath them or within a 35° angle of draw. Unanticipated faults and thin overburden have resulted in more surface effects of subsidence than expected, but the Permittee feels the surface will not be effected by subsidence where overburden thickness is greater than 350-500 feet. Perched aquifers may be partially or wholly drained where subsidence does occur, but captured surface or subsurface flow will be recharged to the aquifer and reemerge at a lower point or as mine discharge. Swelling of bentonitic shales minimizes downward movement of ground water and seals subsidence cracks, which is expected to minimize long term impacts of subsidence. In 1982, flow from spring S25-11 was observed to be flowing into a sinkhole.

The main use for water is livestock and wildlife watering. The effect of mining and reclamation on total flow from perennial springs and in perennial streams is expected to be minimal because of the large number of springs, the small flow from each individual spring, and the small contribution from all springs to total streamflow. The majority of water rights that could be effected by subsidence are associated with springs or baseflow from high perched systems. Any changes in water levels should not decrease the availability of water from Utah Fuel's water wells in Eccles Canyon.

Analysis:

The determination that recent declines in spring flow reflect decreasing precipitation cannot be confirmed as there are no climatological baseline data in the PHC. Comparison of flow between springs inside and outside the

permit area are not possible because the only spring outside the permit area that is monitored is S7-11 and it is located just below the ridge and has a very small recharge area. The decline and recovery of flow from the spring at the Valcam Loadout is not documented.

The many small springs are fairly closely spaced, so that large wildlife and livestock could easily relocate their watering patterns if one were to dry up, but any loss of water use is considered significant by the Division of Water Rights. Loss of habitat is also difficult to replace. A larger number of smaller habitats dispersed over various elevations and aspects may support a greater diversity of plant and animal life than a smaller number of larger habitats.

The current status of the flow from spring S25-11 into the sinkhole, observed in 1982, is not reported. This could be a significant documentation regarding the longer term effects of subsidence on ground and surface water flow.

At monitoring station VC-5, the high sodium and chloride levels indicated on Map R614-301-722.100a for the first quarter are evidence that road salting is having a negative impact on that stretch of Eccles Creek. The two anomalous elevated TDS values from the second quarter may be further evidence of the same impact, even though elevated sodium and chloride levels are not evident on the Stiff diagrams.

There are several options to replace or mitigate the loss of rights to water use. According to the Permittee, water rights from high perched systems are the most likely to be jeopardized by subsidence; these will also be the hardest to replace, especially as to loss of use and habitat. There is no current data on the elevation and location of water table, even though the Permittee expects no significant changes in its status since the original potentiometric surface map was made in 1980.

Deficiency:

1. Applicable deficiencies on toxic- and acid-forming materials, coal analysis, subsidence, and precipitation have been covered in previous sections. The Permittee shall update the PHC as needed to include the information used to address those deficiencies.

2. The Permittee shall include in the PHC updated information on flow from spring S25-11, which in 1982 was flowing into a sinkhole.

3. The Permittee shall include the Valcam Loadout in future seep and spring surveys.

4. The Permittee shall justify deletion of the sample analyses for VC-5 for June 27, 1986 and April 22, 1988 from the determination of the PHC.

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