GARY R. HERBERT
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Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director
Division of Oil, Gas and Mining
JOHN R. BAZA
Division Director

January 5th, 2017

Corey Heaps, Mine Manager
Canyon Fuel Company, LLC
HC 35 Box 380
Helper, Utah 84526

Subject: Flat Canyon Lease Addition, Task ID #5017, Skyline Mine, Canyon Fuel Company, LLC, C/007/0005

Dear Mr. Heaps:

The Division of Oil, Gas and Mining (the Division) has reviewed the Flat Canyon Lease addition amendment for the Skyline Mine. Division staff has identified areas in the amendment that require additional information prior to final approval.

Please resubmit the entire application by no later than February 3rd, 2017. If you have any questions, please call me at (801) 538-5325.

Sincerely,

for

Daron R. Haddock
Coal Program Manager

1594 West North Temple, Suite 1210, PO Box 145801, Salt Lake City, UT 84114-5801
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Technical Analysis and Findings

Utah Coal Regulatory Program

PID: C0070005
TaskID: 5017
Mine Name: SKYLINE MINE
Title: FLAT CANYON LEASE ADDITION

General Contents

Violation Information

Deficiencies Details:

The minimum requirements for R645-301-113 were not met.

An AVS evaluation was generated on 10/18/2016. Three outstanding violations are listed. Violation #833-9006 Bowie Refined Coal LLC, Violation #C61014-P004/1 BRC Chinook LLC, Violation #C61014-P004/2 BRC Chinook LLC, linking entities are Rickmeier Advisors Inc.

Any outstanding violations in the Applicant Violator System must be settled prior to permit issuance.

ssteab

Permit Application Format and Contents

Deficiencies Details:

R645-301-121.100, The location of monitoring well 15-21-2 must be shown on Dwg 2.3.6-1, Location of Hydrologic Monitoring Stations.

pburton

Permit Application Format and Contents

Deficiencies Details:

The amendment does not meet the State of Utah R645 requirements for Clear and Concise. The following deficiencies must be addressed prior to final approval:

R645-301-121:
1) The water monitoring program map must be updated to clearly display only active water monitoring sites. In-active or unmonitored locations must be removed from the water monitoring program. The water monitoring sites on Drawing 2.3.6-1 must directly coincide with the water monitoring Table 2.3.7-1. The proposed water monitoring program from the PHC must be incorporated into Drawing 2.3.6-1 and Table 2.3.7-1 in redline-strike out format in order to clearly convey the water monitoring for the Skyline mine. Water monitoring sites may only have one name and this name must be consistent throughout all documents including the â€˜Spring and Seep Survey (1997)â€™, the PHC, and the main text in the MRP. All proposed water monitoring sites for the Flat Canyon Lease addition must be clearly shown as new sites in the Redline

Strikeout format.

2) The water monitoring program map must include lease boundaries. Lease boundaries with their respective lease names must be shown on Drawing 2.3.6-1. This will clearly show where water resources are monitored above, within, and below the permit area.

3) The mine workings map in Appendix P Figure 9 must be updated to show the current mine working plan. The map still shows Boulger reservoir as being undermined.

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Reporting of Technical Data

Deficiencies Details:

The amendment does not meet the State of Utah R645 requirements for Reporting of Technical Data. The following deficiencies must be addressed prior to final approval:

R645-301-130. The amendment does not meet the State of Utah R645 requirements for Reporting of Technical Data. The amendment must report all well completion information for all existing and future wells within and adjacent to the current permit area and the proposed permit area. This information must include:
1. Location, date drilled, and aquifer represented.
2. Ground elevation and the elevation of the casing height where GW measurements are taken.
3. Drill bit and casing diameter.
4. Packer base depth and elevation.
5. Casing depth and total depth.
6. Length of screen, depth and elevation of screen.
7. Geologic formation the screen spans.
8. Total hydraulic head elevation.
9. Is the well operational and the method of measuring formation pressure.
10. Gravel pack - yes or no.
11. Casing material.
12. Well development techniques.

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Environmental Resource Information

Hydro Baseline Information

Deficiencies Details:

The amendment does not meet the State of Utah R645 requirements for Hydrologic Baseline Information. The following deficiencies must be addressed prior to final approval:

R645-301-141; R645-301-722.100:
1) The amendment must provide a plan view potentiometric map of the surficial aquifer contained within the Qal unit along Boulger and Flat Canyon creeks and Upper Huntington Creek adjacent to the permit area. Given this surficial aquifer is a small area to map and clearly present, the map displaying the potentiometric surface must be at a scale between 1:6,000 to 1:12,000. The contour interval for the equipotential lines will be no greater than 10 feet. All groundwater elevation data points and the water monitoring stations, including piezometers and spring elevations, used to quantify and interpolate the potentiometric gradient of the surficial aquifer must be clearly displayed on the map.

2) The amendment must include a Spring and Seep survey. The PHC references a spring and seep survey that was conducted by Mayo in 1997-1998, but the MRP only contains the map of this survey. The supporting narrative and survey methods for the map must be included in the amendment.

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Hydro Baseline Cumulative Impact Area

Deficiencies Details:

The amendment does not meet the State of Utah R645 requirements for Baseline Cumulative Impact Area Information. The

following deficiency must be addressed prior to final approval:

R645-301-725, R645-301-525 The Permittee must provide a detailed description of all water resources within the lease area. The discussion of groundwater rights on page 2-30(I) should be expanded to include a description and condition of any structures related to the development of these springs, such as the campground spring. Documentation of these structures will help establish a baseline condition, which could then be referenced if there is any future damage caused by subsidence when the area is undermined.

R645-301-728 The Permittee needs to include a commitment in the MRP which would clearly state that any annual stream surveys conducted on Eccles Creek will be submitted with the annual report.

R645-301-728 There is conflicting information within the MRP about the flow levels in Eccles Creek that would potentially cause damages to the stream bank. On page 2-46b of the MRP, the Permittee states that the creek can safely handle 30,000 gpm, when the report provided by Peterson Hydrologic in the PHC Addendum Volume 2 â€" Appendix N, states that damage could start occurring at flows of 15,000 gpm. This must be clarified or corrected.

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Hydro Baseline Cumulative Impact Area

Deficiencies Details:

R645-301-725: The amendment does not meet the State of Utah R645 requirements for Baseline Cumulative Impact Area. The following deficiency must be addressed prior to final approval:

The location and extent of faults within the Skyline mine area directly relate to the water resources of the area. Therefore, it is important to include faults and their associated names on water monitoring Drawing 2.3.6-1.

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Hydro Modeling

Deficiencies Details:

The amendment does not meet the State of Utah R645 requirements for Modeling. The following deficiency must be addressed prior to final approval:

R645-301-726 The Permittee must provide the updated modeling information related to the Flat Canyon Lease.

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Probable Hydrologic Consequences Determination

Deficiencies Details:

I)Findings:
The amendment does not meet the State of Utah R645 requirements for Probable Hydrologic Consequences. The follow deficiencies must be addressed prior to final approval:

R645-301-728:
The regional aquifer held within Star Point Sandstone in the Flat Canyon Lease and surrounding area is under confined pressure. This is seen in the elevated potentiometric head in the recently blocked wells 99-28-1, 20-4-1, and 20-4-2. The confining pressure that elevates this potentiometric surface above the elevation of the Star Point Sandstone will be relieved as mine entries are driven into the Flat Canyon lease. Major pressure releases and inflows into mine workings will occur as entry development intersects secondary porosity flow paths along faults and fractures. As mine workings depressurize the confined Star Point Sandstone regional aquifer it will convert to an unconfined aquifer. The mine dewatering will thus drop the potententiometric head down to the elevation of the Star Point Sandstone between roughly 7000â€™ and 7750â€™ feet. The PHC must go into more detail regarding the following:

1) The PHC must discuss the transition from confined to unconfined conditions of the Star Point Sandstone aquifer during mining of the Flat Canyon Lease. The amendment must address if this transition will have any impact on surface water and groundwater resources within and adjacent to the permit area.

2) It appears the potentiometric head in the Star Point Sandstone wells have fluctuated in a similar pattern as the surface

elevations of Electric Lake over the years, or both the wells and the lake dropped to their lowest levels in mid-2003 and have since recovered. The PHC must discuss the effect(s), if any, that dropping the potentiometric head of the confined aquifer to be lower in elevation directly adjacent to the base of Electric Lake will have on lake storage capacity. The narrative must discuss if Electric Lake acts as a constant head boundary buffering any drop in the potentiometric surface of the confined aquifer to the west of Electric Lake with regard to regional drawdown from well JC-1 or the dewartering of Mine No. 2 workings.

3) It is assumed from past experience within the Skyline mine the greatest and nearly instantaneous inflows into the mine will be when mine entries drive into faults or fault zones. The PHC estimates flows of up to 15,000 gpm may occur while mining in the Flat Canyon Lease, but provides no justification for this estimate. The PHC must provide a detailed narrative and calculations for how it arrived at 15,000 gpm that could enter the mine. The narrative must discuss where these flows are anticipated to be encountered, i.e. what are the names of the faults and what is current estimation of the hydraulic head sitting within these faults that will flow into the entries.

II) Findings:
R645-301-731.121; R645-301- 722.100; R645-301-724.300; R645-301-728: The amendment does not meet the State of Utah R645 requirements for Probable Hydrologic Consequences. The following deficiencies must be addressed prior to final approval:

The final postmining groundwater flow and mine pools within the Skyline mine and proposed Flat Canyon Lease must be compared to the premining groundwater flow paths and discussed with respect to the surficial aquifers and the regional Star Point Sandstone groundwater system. The comparison and discussion must discuss the hydrologic divide between the Price River and San Rafael drainages and address pre- and post-mining surface water and groundwater divides with respect to this boundary.

III) Findings:
R645-301-728: The amendment does not meet the State of Utah R645 requirements for Probable Hydrologic Consequences. The following deficiencies must be addressed prior to final approval:

The amendment must include a schedule for conducting stream surveys to identify subsidence cracks within stream beds as they are being undermined. Additionally, the amendment must detail a plan of action for repairing crack(s) within the stream bed and discuss how the plan of action will address any damage to the hydrologic balance and sediment loading downstream that may occur due to the subsidence crack(s).

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Maps Monitoring and Sampling Locations

Deficiencies Details:

The amendment does not meet the State of Utah R645 requirements for Monitoring and Sampling Location Maps. The following deficiency must be addressed prior to final approval:

R645-301-722; R645-301-724.100:
The monitoring location of springs S28-110, S4-429, S3-290, S32-279, S32-277 and many others shown in the PHC (Petersen, 2014) do not match the surveyed location of the spring in the Spring and Seep map (Mayo, 1997). According to the Spring and Seep map it appears no springs discharge at the locations shown on Figure 2 in the PHC. These discrepancies must be corrected by confirming the correct springs have been monitored for baseline at their surveyed locations. Additionally, when these springs are added to Figure 2.3.6-1 in redline strike-out form they must be in the correct locations as shown on the Spring and Seep map.

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Maps Subsurface Water Resources

Deficiencies Details:

The amendment does not meet the State of Utah R645 requirements for Subsurface Water Resource Maps. The following deficiency must be addressed prior to final approval:

R645-301-722.100:
The amendment must provide a current potentiometric surface plan view map of the confined regional aquifer within the Star

Point sandstone below the workings. The equipotential lines of the confined aquifer must be updated in Drawing 2.3.4-2. The current water level elevation of JC-1 and JC-2 must used to update the map. All groundwater elevations measured in water monitoring wells used to quantify and interpolate the potentiometric gradient of the confined aquifer must clearly be displayed on the map. The contour interval for the equipotential lines must be tightened to 50 feet to give a clear picture of the aquifer.

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Operation Plan

Hydrologic Ground Water Monitoring

Deficiencies Details:

The amendment does not meet the State of Utah R645 requirements for Groundwater Monitoring. The following deficiency must be addressed prior to final approval:

R645-301-731.210 Due to concerns about groundwater volumes that could be encountered while mining in the Flat Canyon Lease, the Permittee should specify how flow volumes, coming out of the Flat Canyon Lease area specifically, will be monitored and reported.

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Hydrologic Ground Water Monitoring

Deficiencies Details:

I) Findings:
The amendment does not meet the State of Utah R645 requirements for Groundwater Monitoring. The following deficiency must be addressed prior to final approval:

R645-301-731.211:
The groundwater monitoring plan must include measuring the water level in JC-1 and JC-2. The water level of JC-1 and JC-2 must be operationally measured quarterly.

II) Findings:
The amendment does not meet the State of Utah R645 requirements for Groundwater Monitoring. The following deficiency must be addressed prior to final approval:

R645-301-731.200:
Wells must be installed in three distinct groundwater zones.
1) The water level of surficial aquifers along perennial streams held within the Qal unit must be measured with wells or piezometers. The wells must be paired with surface water monitoring stations. Both the wells at the edge of the stream and stream monitoring station must be along a cross-section oriented perpendicular to flow. The following surficial aquifers must be monitored at each stream monitoring location along the Left (south), Right (west), and Main branches of Boulger creek and the Main branch of Swens Canyon creek for a total of eight wells. Refer to the â€˜Surface Water Monitoringâ€™ for required operational surface water monitoring locations. The screen length should reflect the thickness of the aquifer the well is installed in considering there are fully saturated alluvial deposits up to 90 feet thick in these areas.

2) Wells must be installed or old wells must be rehabilitated within the Star Point Sandstone in multiple locations within the Flat Canyon lease. The distribution of wells must reflect the old Star Point Sandstone aquifer well monitoring program of the now blocked wells 99-28-1, 20-4-1, and 20-4-2. These no longer functioning wells were adequate because they were oriented to measure the north-south gradient of the Star Point Sandstone aquifer within the lease area, they were evenly distributed in multiple locations, and they were oriented in the direction of mining.

3) A minimum of one well must be installed in the Upper Blackhawk formation within Boulger Canyon in order to insure the upper formation aquifers that supply springs continue to function as normal during active mining operations.

III) Findings:
The amendment does not meet the State of Utah R645 requirements for Groundwater Monitoring. The following deficiency must be addressed prior to final approval:

R645-301-731.200:

The amendment must include a groundwater monitoring plan to measure and report to the Division the potentiometric head within major faults. The potentiometric head must be measured prior to the initial contact during mains development into and through fault zones. The potentiometric head on the major faults must be measured and reported at each subsequent crossing of the same fault during mains development. The monitoring program must provide a detailed narrative outlining the methods that will be followed for measuring the potentiometric head within the faults. The narrative must discuss the anticipated volume of water held within each major fault zone. The monitoring program will include a map showing the anticipated locations and month/year that mains development will cross major faults. The monitoring program must include but is not limited to measuring the potentiometric head at the following faults during mains development: 11-Left Faults, 14-Left Faults, 16-Left Faults, Flat Canyon #2 Fault, Flat Canyon #1 Fault, Gooseberry South Fault.

IV) Findings:
The amendment does not meet the State of Utah R645 requirements for Groundwater Monitoring of Springs. The following deficiencies must be addressed prior to final approval:

R645-301-731.200:
The spring monitoring plan must add additional operational monitoring locations within the Flat Canyon Lease and within the Federal L.M.U. lease to the east that will be undermined by the workings. At least two springs must be operationally monitored in the major drainages within the lease boundaries including: Little Swens Canyon, Swens Canyon, Flat Canyon, and Boulger Canyon. This will give a better distribution of spring monitoring across the area slated to be undermined. Spring locations must also be equally distributed across maximum expected and minimum anticipated subsidence zones, i.e. directly above the center of panels and directly above entries. The spring monitoring locations must also reflect the percentage of surficial exposure of all the geologic units within the lease area i.e. the unit with the greatest exposure within the lease area should have the most spring monitoring points. Baseline springs that fall within the Flat Canyon lease and their paired counterpart springs must be added to the operational monitoring plan.

V) Findings:
The amendment does not meet the State of Utah R645 requirements for groundwater monitoring of springs. The following deficiencies must be addressed prior to final approval:

R645-301-731.200:
The spring monitoring plan is not designed to detect impacts to the hydrologic balance within the permit area. During the Skyline field visit in November we visited spring 4-173 that is proposed to be monitored. While standing at the spring it was apparent that a directly adjacent spring with a higher flow originated from the same catchment source. The adjacent spring is documented in the Mayo 1997 spring and seep survey as spring 4-169. In order to properly measure total flow from the catchment source the spring monitoring plan must include monitoring both 4-173 and 4-169.
This is the same case with spring S28-110 slated for the monitoring program. While Spring S28-110 appears to be in a good monitoring location it is directly adjacent to S28-111. The subsurface flow paths creating groundwater discharge at these two spring locations is from the same catchment source. In order to accurately document groundwater discharge from this area on the slope spring S28-111 must be included in the monitoring program.
The baseline spring S5-231 discharges at the toe of the slope directly adjacent and inline with springs 5-230 through 5-234. The subsurface flow paths creating groundwater discharge at these five spring locations is from the same catchment source. In order to accurately document groundwater discharge from this area all five springs must be included in the monitoring program.
Spring S32-277 and 32-276 are paired springs as well. Therefore spring 32-276 must be added to the spring monitoring plan.

VI) Findings:
The amendment does not meet the State of Utah R645 requirements for Groundwater Monitoring. The following deficiencies must be addressed prior to final approval:

R645-301-731.200:
Mine workings in the Flat Canyon Lease will encounter significant amounts of water where entries bisect faults. The groundwater monitoring plan must include a commitment to monitor in-mine flows at locations where a significant amount of water is discharging into the mine over a given period of time. The plan must include when and where the discharges occur and the water monitoring Drawing 2.3.1-6 must be updated to reflect these in-mine water monitoring locations. These locations must be monitored operationally.

VII) Findings:
The amendment does not meet the State of Utah R645 requirements for Groundwater Monitoring. The following deficiencies must be addressed prior to final approval:

R645-301-731.200:

In order to insure groundwater at JC-1 and within Flat Canyon Lease mine workings is discharging from the Star Point Sandstone aquifer additional water quality testing must be done at baseline or every 5 years. The groundwater must be tested using the Microscopic Particulate Analysis (MPS) at JC-1 and in at least one location in the mine workings west of Electric Lake. The in-mine location sampling location west of the lake should be where significant inflow to the workings is occurring from a fault closest to the lake.

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Hydro Surface Water Monitoring

Deficiencies Details:

The amendment does not meet the State of Utah R645 requirements for Surface Water Monitoring. The following deficiencies must be addressed prior to final approval:

R645-301-731.220:
Every perennial stream and perennial branches to be undermined must have two stream water monitoring locations along its length prior to converging with another stream or stream branch. The two monitoring locations must be spaced so as to be representative of both the upper and lower segments of the stream length. The perennial streams and stream branch segments that must have two water monitoring locations includes:
1. Little Swens Canyon Drainage
2. Main branch of Swens Canyon Drainage: Above confluence with south branch
3. South branch of Swens Canyon Drainage: Above confluence with main branch
4. Flat Canyon Drainage: Above confluence with Boulger creek
5. Right (west) branch of Boulger creek
6. Left (south) branch of Boulger creek
7. Main branch of Boulger creek: Below confluence of left and right branches and above Boulger reservoir
8. Boulger creek: Below confluence of Flat Canyon and above confluence with Upper Huntington creek
9. Upper Huntington creek: UPL-10 and a gauging location above Swens Canyon Drainage

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Hydrologic Gravity Discharge From Underground Mine

Deficiencies Details:

I) Findings:
The amendment does not meet the State of Utah R645 requirements for Gravity Discharges from an Underground Mine. The following deficiencies must be addressed prior to final approval:

R645-301-724.310:
Floor elevation of current mine workings map and of future projected workings in the Flat Canyon lease area. The mine workings map must indicate the seam that was or will be mined.

II) Findings:
The amendment does not meet the State of Utah R645 requirements for Gravity Discharges from an Underground Mine. The following deficiencies must be addressed prior to final approval:

R645-301-724.310:
The amendment must provide a narrative, supporting calculations, and map(s) of current mine pools and mine pools that will develop after mining is complete. The narrative must discuss the quantity or volume of water held within the workings and gob. The supporting calculations must determine the maximum hydraulic head that will develop following mine reclamation. The map(s) must use the mine workings floor elevation map to show the location and extent of current mine pools and the expected mine pool(s) after mining is complete in the Flat Canyon area. The map must include hydraulic divides that may be present in the mine workings and the maximum expected elevation of the final mine pool(s) when mining is finished and the pumps including JC-1 are shutoff. Finally, the amendment must address the potential for the mine pool to gravity discharge from all portals and vent shafts.

III) Findings:
The amendment does not meet the State of Utah R645 requirements for Gravity Discharges from an Underground Mine. The following deficiencies must be addressed prior to final approval:

R645-301-724.310:
The amendment must discuss the water quality of the current mine pools and the expected water quality of future mine pools. The narrative must discuss the maximum potential head of the mine pool in the Flat Canyon and Southwest workings and whether the mine pool will come into contact with surface waters or shallow groundwater resources.

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