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TECHNICAL MEMORANDUM
Utah Coal Regulatory Program

June 9, 2009

TO: Internal File

THRU: Jim Smith, Permit Supervisor JS 06/11/09

FROM: Steve K. Christensen, Environmental Scientist/Hydrologist SKC

RE: Degas Wells G-25 and G-26, Canyon Fuel Company, LLC., Dugout Canyon Mine, C/007/0039, Task ID #3274

SUMMARY:

On April 30th, 2009 the Division of Oil, Gas and Mining (the Division) received an application from Canyon Fuel Company (the Permittee) for the construction of methane degas wells G-25 and G-26. The proposed degas wells will provide additional methane gas venting. The Permittee has provided the hydrologic calculations for runoff volumes from the pad and top soil stockpiles as well as for the sediment control berms to be constructed.

Degas wells G-25 and G-26 are located within the current permit area. The proposed degas wells and their associated pads will provide an additional 3.6 acres of disturbed area. The following analysis has been assigned a review number of Task ID #3274 for tracking purposes.

The hydrologic information provided in the Degas Wells G-25 and G-26 application does not meet the requirements of the State of Utah R645-Coal Mining Rules. Prior to receiving Division approval, the Permittee must address the following deficiency:

R645-301-521- The Permittee must revise Plate 4, *Pace Canyon Road System*, of Attachment 5-4. The map depicts the locations of the degas wells and their associated access roads (both existing and constructed). The plate should be revised to clearly depict the locations of degas pads G-25 and G-26 and how they are accessed.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

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

CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.18; R645-301-724.

Analysis:

The application meets the hydrology requirements for Climatological Resource Information as provided in R645-301-724. Page 7-4 of the application provides a reference to Appendix 4-1 of the approved MRP and RA Attachment 7-5 of the Refuse Pile Amendment where climatological data for the proposed project area is provided.

Findings:

The application meets the Climatological Resource Information requirements as outlined in the State of Utah R645-Coal Mining Rules.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

Analysis:

Geologic information for the proposed location for degas pads G-25 and G-26 is presented in Chapter 6 of the application as well as in Chapter 6 of the approved MRP.

Findings:

The information provided meets the Geologic Resource Information requirements as provided in R645-301-724.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Sampling and Analysis

The application meets the Sampling and Analysis requirements of the State of Utah R645-Coal Mining Rules. Page 7-3 of the application provides a reference to Section 723 of the approved MRP in regard to Sampling and Analysis. Section 723 of the approved MRP states that water samples will be collected and analyzed according to the methods outlined in "Standard Methods for the Examination of Water and Wastewater" and 40 CFR parts 136 and 434.

Baseline Information

The application meets the Baseline Information requirements of the State of Utah R645-Coal Mining Rules.

In section 724, Baseline Information, the Permittee discusses the ground and surface water resources in the areas of the proposed degas wells G-25 and G-26. Division staff conducted a field inspection of the proposed locations on November 13th, 2008. During the field inspection of both G-25 and G-26, Division staff noted that the sites appeared to have been previously disturbed (presumably from cattle grazing). No intermittent or perennial streams were observed in the area of the proposed degas pads. Vegetation at the site was primarily sagebrush community. No evidence of riparian vegetation was observed on or near the proposed degas well sites.

During the field inspection, ephemeral drainages were observed to the northeast and southwest of the proposed G-25 site. Flow was not observed in these drainages during the field inspection.

The pad for G-26 is situated at the top of a small ephemeral drainage. Flow was not observed in the drainage at the time of the field inspection.

The sites are accessed via existing roads. In the absence of any intermittent or perennial drainage, the proposed sites do not require the installation of any culverts or any other type of diversion.

The seep and spring studies of the proposed degas sites are provided in Chapter 7 of the MRP. Plate 7-1 depicts the locations of the springs and seeps identified in those studies. Based upon the spring and seep studies within the approved MRP, the absence of any perennial or

intermittent drainages and the field inspection, it does not appear that the construction and operation of proposed degas wells G-25 and G-26 presents a potential for ground or surface water impacts.

Modeling

The application meets the Environmental Description requirements for Modeling. No ground or surface water modeling was conducted in preparation for the gob vent hole installations.

Probable Hydrologic Consequences Determination

The application meets the Probable Hydrologic Consequences (PHC) Determination requirements of the State of Utah R645-Coal Mining Rules.

On page 7-11 of the application, the Permittee discusses the probable hydrologic consequences (PHC) of the proposed degas wells on hydrologic resources within the area. Based upon the presented baseline information (See Section 724 of amendment), no seeps and springs are located within in the area of the proposed degas wells. The seep and spring studies of the area are provided in Chapter 7 of the MRP. Plate 7-1 depicts the locations of the springs and seeps identified in those studies.

Division staff conducted a field inspection of the proposed location on November 13th, 2008. During the field inspection of both G-25 and G-26, Division staff noted that the sites appeared to have been previously disturbed (presumably from cattle grazing). No intermittent or perennial streams were observed in the area of the proposed degas pads. Vegetation at the site was primarily sagebrush community. No evidence of riparian vegetation was observed on or near the proposed degas well sites.

During the field inspection, ephemeral drainages were observed to the northeast and southwest of the proposed G-25 site. Flow was not observed in these drainages during the field inspection. The pad for G-26 is situated at the top of a small ephemeral drainage. Flow was not observed in the drainage at the time of the field inspection.

Due to the lack of seeps and springs in the area as well as the ephemeral nature of the drainages located in the areas adjacent to the proposed degas wells, the probable hydrologic consequences are minimal. The Permittee has committed to installing sediment controls prior to construction. The sediment controls will remain in place during construction and operation. The Permittee further commits to leave the sediment controls in place during reclamation until such time that the Division determines that vegetation has been established and the reclaimed slopes are stable.

As a result of the sediment controls to be implemented at the proposed degas well sites and the overall lack of ground and surface water resources (both within the disturbed area of the proposed degas wells and adjacent to them) present at the sites, the potential for impacts to the hydrologic balance are minimal.

Findings:

The application meets the Hydrologic Resource Information requirements of the State of Utah R645-Coal Mining Rules.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Subsurface Water Resource Maps

Plate 7-1, *Hydrologic Monitoring Stations*, of the approved MRP depicts the subsurface water resources in the vicinity of proposed degas wells G-25 and G-26.

Surface Water Resource Maps

Plate 7-1, *Hydrologic Monitoring Stations*, of the approved MRP depicts the surface water resources in the vicinity of proposed degas wells G-25 and G-26.

Findings:

The hydrologic information provided meets the Maps, Plans and Cross Sections of Resource Information requirements as provided in R645-301-722 and R645-301-731.

OPERATION PLAN

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 784.24, 817.150, 817.151; R645-301-521, -301-527, -301-534, -301-732.

Analysis:

Plans and Drawings

The application does not meet the Plans and Drawings for Road Systems and Other Transportation Facilities requirements of the State of Utah R645-Coal Mining Rules.

Based upon a field inspection performed by Division personnel on November 13th, 2008, it was observed that degas wells G-25 and G-26 are accessed via existing roads. No new road construction will be necessary for the construction and utilization of degas wells G-25 and G-26.

However, the Permittee must revise Plate 4, *Pace Canyon Road System*, of Attachment 5-4. The map depicts the locations of the degas wells and their associated access roads (both existing and constructed). The plate should be revised to clearly depict the locations of degas pads G-25 and G-26 and how they are accessed.

Findings:

The application does not meet the Road Systems and Other Transportation Facilities requirements of the requirements of the R645-State of Utah Coal Mining Rules. Prior to receiving Division approval, the Permittee must address the following deficiency:

R645-301-521- The Permittee must revise Plate 4, *Pace Canyon Road System*, of Attachment 5-4. The map depicts the locations of the degas wells and their associated access roads (both existing and constructed). The plate should be revised to clearly depict the locations of degas pads G-25 and G-26 and how they are accessed.

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Disposal Of Noncoal Mine Wastes

The application states that no hydrocarbon products will be stored at the well sites. However, the Permittee has stated that absorbent materials will be used for the collection of leaked fuels, greases and other oils that may be spilled during the installation of the vent holes. The saturated absorbent materials will then be disposed of at an appropriate landfill facility.

Findings:

The hydrologic information provided meets the Spoil and Waste Materials Operation requirements as provided in R645-301-747.

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:

General

The application meets the requirements for General Hydrologic information as required by the State of Utah R645-Coal Mining Rules. The Hydrologic Information is presented in chapter 7 of the application. The application discusses the potential impacts to hydrologic resources, provides the design criteria and hydrologic designs utilized at the degas site and also provides the applicable hydrologic performance standards for the drainage features at the degas sites.

Acid- and Toxic-Forming Materials and Underground Development Waste

The application states that no acid or toxic forming materials have been identified in the soils or strata of the Dugout Canyon Mine. The application references Appendix 6-2 of the approved MRP that outlines the finding that the Dugout Canyon Mine area does not contain potentially acid forming or toxic material. The application also references Chapter 6, Section 623 of the Methane Degasification Amendment, which states, "No acid or toxic forming materials will originate at the well sites."

Diversions: General

The application meets the Diversions: General requirements of the State of Utah R645-Coal Mining Rules. The construction and operation of degas wells G-25 and G-26 will not require diverting a intermittent or perennial drainage. The ephemeral drainages located adjacent to the proposed sites for G-25 and G-26 will not require a diversion to be installed in order to maintain their current function.

Stream Buffer Zones

The application meets the Stream Buffer Zone requirements of the State of Utah R645-Coal Mining Rules.

Based upon the baseline characterization provided in Section 724 of the amendment, the drainages located adjacent to the proposed degas pad are ephemeral in nature and as such, do not require a stream buffer zone.

Sediment Control Measures

The application meets the Sediment Control Measure requirements of the State of Utah R645-Coal Mining Rules.

The application discusses sediment control measures in Sections 532, 732, 742 and 752. Beginning on page 7-21 of the application, the Permittee discusses specific sediment control measures and practices to be implemented during the construction and operation of the proposed degas wells.

The Permittee commits to utilizing berms, silt fences and/or straw bale dikes to control sediment transport off the disturbed area. The sediment controls will be installed prior to construction and will be maintained through the operational and reclamation phases. Sediment controls will be installed prior to construction and will remain in place during the operational and reclamation phases of the degas pads and associated roads. Removal of the structures during reclamation is addressed in Section 761.

The Permittee commits to periodically inspecting all degas drill sites and associated access roads. The inspections will include, but not be limited to inspections following major precipitation events. Based upon the inspections, the sediment controls will be repaired and accumulated sediment removed as needed in order to maintain functionality and retain sediment on the disturbed area.

In addition, the Permittee commits to bi-annual inspections of the sediment controls with Division staff: one inspection in the spring/early summer and one in the fall. Based upon those

inspections, the Permittee commits to repairing the sediment controls as needed in a timely fashion following the spring/early summer inspection and prior to the onset of winter/non-accessible conditions following the fall inspection.

The sediment control measures utilized at the degas pads and associated access roads will be maintained until removal is authorized by the Division and the disturbed area has been stabilized and revegetated (See Section 761 of the application).

Siltation Structures: General

The application meets the Operational Plan requirements for Siltation Structures: General as provided in R645-301-742.212. No sediment ponds are proposed for this project.

Siltation Structures: Other Treatment Facilities

The application meets the Siltation Structures: Other Treatment Facilities requirements of the State of Utah R645-Coal Mining Rules.

The application provides calculations and design considerations for the berms and containment structures to be utilized at the proposed degas sites. Attachment 7-1 provides the hydrologic calculations for proposed degas wells G-25 and G-26. The Permittee will utilize a combination of silt fence and earthen berms to contain storm water runoff on the proposed degas well sites.

The berms were designed by utilizing the Soil Conservation Service (SCS) method for calculating peak flows. The SCS method incorporates generalized loss-rate and runoff relationships developed from watershed studies in the United States. A total runoff volume was calculated for the pad areas utilizing a 10-year, 24-hour rainfall event as required by state regulations (Other Treatment Facilities--R645-301-742.230). Berm dimensions were then calculated to contain the design storm event for each of the three areas outlined above. The application provides the calculations utilized in determining the proper silt fence and berm sizing to handle the 10-year, 24-hour storm event.

Impoundments

The application meets the Impoundment requirements of the State of Utah R645-Coal Mining Rules.

On page 7-17 of the application, the Permittee states, "No permanent impoundments will exist at the well sites".

Findings:

The hydrologic information provided meets the Hydrologic Information requirements of the State of Utah R645-Coal Mining Rules

RECLAMATION PLAN

GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

Analysis:

The reclamation plan is presented in section 540 of the application, with additional information provided in Attachment 5-4. Natural drainage patterns will be restored after degasification is completed. The cut and fill slopes will be reshaped at the well sites. When a siltation structure is removed, the land on which the siltation structure was located will be regraded in accordance with the reclamation plan presented in Section 540. Upon the termination of degasification efforts, the gob vent holes will be sealed in accordance with Federal Regulations 43 CFR CH. 11, Subpart 3484, (3) per a decision by the BLM and the Division. Figure 5-26 outlines the reclamation schedule for degas pad G-22 and it's access road. Figures 2 through 2E provide the post-mining topography that will be re-established once degasification efforts have ceased at well G-22.

Findings:

The application meets the General Reclamation Plan requirements of the State of Utah R645-Coal Mining Rules.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Analysis:

The proposed access road and drill pad will be returned to their approximate original contour during reclamation as detailed in Attachment 5-1. On page 5-16, the Permittee states, "The sites will be regarded to the approximate original contour." Drainages will be restored following the removal of the culvert and any associated structures. Attachment 5-1 of the application provides cross-sections that depict the final surface configuration of the pad and access road. Figures 2 through 2E provide the post-mining topography that will be re-established once degasification efforts have ceased at well G-22.

Findings:

The application meets the Approximate Original Contour requirements of the State of Utah R645-Coal Mining Rules.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Analysis:

Reclamation

The application meets the Reclamation of Road Systems and Other Transportation Facilities requirements of the State of Utah R645-Coal Mining Rules.

The roads that existed prior to the drilling program will be retained after reclamation. The access roads established during the drilling program will be reclaimed after methane extraction has been completed.

The access road utilized for degas well G-22 will be returned to its approximate original contour during reclamation as detailed in Attachment 5-4. Drainages will be restored following the removal of culverts and any associated structures. The reclaimed segments of the drainages will be tied into the existing segments of the drainage. When possible, the restored drainages will be armored with native rock obtained and stockpiled during the construction phase of the access road. Reclaimed drainages will be seeded with the approved seed mix. The road surface will be ripped a minimum of 12 inches prior to the placement of subsoil and topsoil. If it becomes necessary to add gravel to the road surface during the operational phase, it will be left in place and ripped to relieve compaction. Subsoil fill material and topsoil will be placed on top of the ripped surface.

Findings:

The application meets the Reclamation of Road Systems and Other Transportation Facilities requirements of the State of Utah R645-Coal Mining Rules.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

Analysis:

The potential for impacts to the hydrologic balance from the construction and operation of proposed degas wells G-25 and G-26 are minimal. As such, a revision to the Cumulative Hydrologic Impact Assessment is not necessary with this amendment.

Findings:

The hydrologic information provided meets the Cumulative Hydrologic Impact Assessment requirements as provided in R645-301-730.

RECOMMENDATIONS:

The hydrologic information provided in the application does not meet the requirements of the State of Utah R645-Coal Mining Rules.

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