

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

July 20, 2007

TO: Internal File

THRU: Pamela Grubaugh-Littig, Permit Supervisor *pgl*

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

RE: Degas Well G-19, Canyon Fuel Company, LLC., Dugout Canyon Mine,
C/007/0039, Task ID #2812

SUMMARY:

On June 18th, 2007, the Division of Oil, Gas and Mining (the Division) received an application from Canyon Fuel Company (the Permittee) for the construction of methane degasification well G-19 (degas well G-19) at the Dugout Mine. Task ID #2812 has been assigned to this review for tracking purposes.

The hydrologic information provided in the application meets the requirements of the State of Utah R645-Coal Mining Rules. The application should be approved.

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TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

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

GENERAL

Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

Analysis:

The application meets the hydrology requirements for general information as provided in R645-301-721. Beginning on page 7-1 of the application, references are provided to various sections of the approved MRP that describe the hydrological resources in the gob vent hole project area. Figure 7-1 of the MRP shows a generalized hydrostratigraphic cross section of the permit area as well as the proposed well site. Plate 7-2 of the MRP depicts the locations of surface-water bodies and existing or pending water rights. In addition section 724 of the MRP provides baseline information for the permit area including the proposed degas well site.

Findings:

The hydrologic information provided meets the requirements of R645-301-721-Environmental Description.

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 is provided.

Findings:

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

GEOLOGIC RESOURCE INFORMATION

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

Analysis:

Geologic information related to degas well G-19 site is presented in Chapter 6 of the Methane Degasification Amendment Wells: G-1 Thru G-17 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

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 provides a reference to Section 724 of the approved MRP. Section 724 of the approved MRP provides baseline information for the permit area (including the proposed site for gob gas vent hole G-19).

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Baseline Cumulative Impact Area Information

The application meets the Environmental Description requirements for Baseline Cumulative Impact Area Information (CHIA). The cumulative impact area (CIA) currently in place for the Dugout Canyon Mine covers the proposed gob vent hole locations and the information required for the Division to develop a Cumulative Hydrologic Impact Assessment (CHIA) is presented in the approved MRP. In Section 725 on page 7-4 of the application, chapters 6 and 7 (of approved MRP) are referenced. Chapters 6 and 7 of the MRP provide the hydrologic and geologic information required by the Division to develop a CHIA.

Modeling

The application meets the Environmental Description requirements for Modeling. No groundwater monitoring was conducted in preparation for the gob vent hole installations.

Probable Hydrologic Consequences Determination

The application meets the hydrology Environmental Description requirements for Probable Hydrologic Consequences (PHC) as provided in R645-301-728.300. Page 7-5 thru 7-6 of the application discusses the subsections of the probable hydrologic consequences regulations. The probable hydrologic consequences are further discussed in detail in Section 730 of the MRP. Appendix 7-3, Section 3 contains a Mayo and Associates PHC report that provides hydrologic information for the permit and adjacent area (including the G-19 degas well site).

Potential impacts to the hydrologic balance

The application meets the hydrology Environmental Description requirements for potential impacts to the hydrologic balance as provided in R645-301-728.310. Page 7-6 of the application states that little to no impacts to the hydrologic balance are anticipated due to 1) the potential impacts are limited to the drilling and construction of the wells; 2) best technology currently available (BTCA) techniques for sediment control will be implemented to minimize the surface disturbance; 3) ground water information provided in the MRP demonstrates that minimal groundwater is located in the area of the proposed degas wells; and 4) any water encountered during the drilling and construction of the well will need to be sealed from the well in order for it to function as an ambient vent of methane gas.

Acid or Toxic Forming Materials

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."

Sediment Yield

The application meets the hydrology Environmental Description requirements for sediment yield consequences as provided in R645-301-728.331. Pages 2-8 and 7-12 of the application states that erosion control measures will include silt fences, berms, seeding, straw bales, soil roughening, and mulching of the drill pad areas. In addition, the Permittee has committed to using the best technology currently available during the installation of the degas wells. As such, impacts to the hydrologic resources in the area of the degas wells due to sedimentation is expected to be minimal.

Ground-water and surface-water availability

The application meets the hydrology Environmental Description requirements for ground water and surface-water availability as provided in R645-301-728.334. Page 7-6 and 7-7 outlines the potential impacts to ground water and surface water availability. As outlined in the baseline information provided in the MRP, little ground water is located in the area of the proposed degas wells. If ground water is encountered during drilling, the ground water aquifers will be sealed using drilling mud. Upon the completion of the degas well, the casing will be grouted and cement will be placed inside the well casing during reclamation. The grouting of the casing inside the well hole will effectively prevent ground water from entering into the degas wells. In order for the degas wells to function properly, any encountered ground water must be prevented from entering.

The degas wells have little potential to impact or decrease creek flow or spring discharges. The wells are not designed to capture water, dewater aquifers or cause subsidence. In addition, no measurable water was encountered during the drilling and construction of degas wells G-1 thru G-9.

Potential hydrocarbon contamination

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 would then be disposed of at an appropriate landfill facility.

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Groundwater Monitoring Plan

A groundwater-monitoring plan specific to the installation of gob gas vent hole G-19 is not necessary. The baseline data collected for the approved MRP as well as the ongoing groundwater monitoring is sufficient to meet the groundwater monitoring plan requirements for this project. Plate 7-1 of the approved MRP shows the springs and monitoring well locations where baseline information has been obtained and where ongoing groundwater monitoring continues in association with the mining activity. The operational groundwater-monitoring plan has been designed to detect impacts to groundwater resources from mining activity. As such, additional monitoring is not necessary for the installation and operation of degasification well G-19.

Surface-Water Monitoring Plan

A surface-water monitoring plan specific to the installation of gob gas vent hole G-19. The baseline data collected for the approved MRP as well as the ongoing groundwater monitoring is sufficient to meet the surface-water monitoring plan requirements for this project. Plate 7-1 of the approved MRP shows the stream locations where baseline information has been obtained and where ongoing groundwater monitoring continues in association with the mining activity. The operational surface water-monitoring plan has been designed to detect impacts to surface water resources from mining activity. As such, additional monitoring is not necessary for the installation and operation of degasification well G-19.

Findings:

The hydrologic information provided meets the requirements of R645-301-728-Probable Hydrologic Consequences regulations.

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:

Monitoring and Sampling Location Maps

Plate 7-1 (Hydrologic Monitoring Stations) of the approved MRP depicts the monitoring and sampling locations utilized for baseline data gathering as well as on-going monitoring activities in the area of the proposed gob vent hole site.

Subsurface Water Resource Maps

Plate 7-1 (Hydrologic Monitoring Stations) of the approved MRP depicts the subsurface water resources in the vicinity of the proposed gob vent hole site.

Surface Water Resource Maps

Plate 7-1 (Hydrologic Monitoring Stations) of the approved MRP depicts the surface water resources in the vicinity of the proposed gob vent hole site.

Well Maps

Plate 7-1 (Hydrologic Monitoring Stations) of the approved MRP depicts the locations of the monitoring wells within the permit area. Monitoring well GW-19-1 is located approximately one mile west of the proposed gob gas vent hole site for G-19.

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 meets the requirements for Plans and Drawings of road systems as provided in R645-301-732. Attachment 5-1 of the application provides a drawing for the proposed drill pad location. Access to degas well G-19 will be achieved via an existing road. The submitted drawings/plan depicts the proposed contours of the drill pads, typical cross-sections as well as pad layouts. The drawings identify the various sediment/erosion control techniques to be implemented at the proposed drill sites including water bars, silt fences and the utilization of a containment berm around the drill pad topsoil stockpile. The drawing depicts the existing road that will be utilized to access the site.

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Performance Standards

The application meets the requirements for Performance Standards of Road Systems and Other Transportation Facilities as provided under R645-301-732 and R645-301-742.400. Page 5-14 of the application indicates the road used to access proposed well site G-19 is an existing road.

The Permittee has committed to minimizing the amount of generated sediment, runoff and suspended solids from the well site area and access roads with the utilization of silt fences, berms and straw bale dikes. In addition, the Permittee commits to not performing construction activities during major precipitation events.

Findings:

The hydrologic information provided meets the requirements of R645-301-732 and R645-742.400.

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.

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as the designed berms to insure that the topsoil stockpiles will be retained on site and that sediment transport off the site will be minimized.

Sediment Control Measures

The application meets the requirements for the Operational Plan Sediment Control Measures to be utilized per R645-301-742. The Permittee has committed to installing water bars as needed in order to direct flow off of access roads. Once the flow is directed off the roads, silt fences or straw bales will be utilized to treat the runoff.

The Permittee has committed to minimizing the amount of generated sediment, runoff and suspended solids from the well site area and access roads with the utilization of silt fences, berms and straw bale dikes. In addition, the Permittee commits to not performing construction activities during major precipitation events.

The application discusses the sediment control measures to be used for the drilling pads on pages 7-9 and 7-10. The Permittee proposes to retain sediment within the disturbed area of the drilling pad by utilizing silt fences and/or straw bales dikes. During initial drilling, the sites will be graded to ensure that the generated runoff will flow towards the berms surrounding the pad. The berms will direct the runoff to the lowest point(s) within the pad area where a silt fence and/or straw bale dike will then treat the runoff. A berm will be placed at the top of the pad's cut slopes to divert runoff around the disturbed area. In addition, a berm and silt fence will be installed at the toe of the fill slope.

After drilling operations are completed, the pad will be re-graded to cause the runoff to flow towards a silt fence and/or straw bale dike. (See Attachment 5-1 for pad layout designs). The Permittee has committed to inspecting the silt fences and/or bale dikes periodically and removing accumulated sediment as needed to maintain functionality. The sediment removed from the structures will be piled on the pad and be used for fill during final reclamation of the well site.

The mud pits will be dismantled and filled following the completion of drilling.

Siltation Structures: General

The application meets the Operational Plan requirements for Siltation Structures: General as provided in R645-301-742.212. The application commits to utilizing berms, silt fences and straw bale dikes to treat runoff. The Permittee has committed to installing siltation structures prior to beginning construction.

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Siltation Structures: Other Treatment Facilities

The application provides calculations and design considerations for the relative berm heights and silt fence dimensions for three areas of the pad: the pad stockpile, the upper road stockpile and the lower road stockpile. 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 area 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

On page 7-9 of the application, the Permittee states that no permanent impoundments will be utilized at the site.

Findings:

The hydrologic information provided meets the requirements for Operational Plan-Hydrologic Information.

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:

Monitoring and Sampling Location Maps

Plate 7-1 (Hydrologic Monitoring Stations) of the approved MRP depicts the monitoring and sampling locations utilized for baseline data gathering as well as on-going monitoring activities in the area of the proposed gob vent hole sites.

Certification Requirements

A certified professional engineer registered with the state of Utah has stamped the submitted maps, plans and cross sections.

Findings:

The Operational Plan requirements for Maps, Plans and Cross Sections of Mining Operations are met by the provided hydrologic information.

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. 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.

Findings:

The hydrologic information provided meets the General Requirements for Reclamation Plan.

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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 application states on page 5-13 that degas well G-19 will be returned to its approximate original contour after the cessation of methane venting. Attachment 5-1 of the application provides a cross-section that depicts the final surface configuration. The contours depicted in Figure 1 of Attachment 5-1, represent the pre-disturbance topography, which will be the final topography once reclamation is completed.

Findings:

The hydrologic information provided meets the Approximate Original Contour requirements as provided in R645-301-764.

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 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 road utilized to access degas well G-19 is an existing road and as such, will be retained after reclamation activities.

Findings:

The hydrologic information meets the Reclamation Plan requirements for Road Systems and Other Transportation Facilities.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

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

Analysis:

Degas well G-19 is located within the current cumulative impact area. No additional impacts are expected from construction of the gob vent holes.

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 meets the requirements of the State of Utah R645-Coal Mining Rules. The proposed amendment should be approved.