

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

September 10, 2004

OK

TO: Internal File

THRU: Wayne H. Western – Team Lead *W H*

FROM: Gregg A. Galecki – Environmental Specialist III - Hydrology *GA*

RE: North Lease Subsidence Mining, Canyon Fuel Company, LLC, Skyline Mine, C/007/0005, Task ID #1976

SUMMARY:

The following analysis is a review of information received by the Division on July 1, 2004. The information provided consists primarily of reports and studies that were outlined to be conducted when the North Lease was originally permitted in November 2002. Reports includes a GPS stream-channel profile survey of Winter Quarters Canyon and Woods Canyon in central Utah, and a report titled, "Riparian Plant Community Survey Near Scofield, Utah". Both reports are submitted as additional baseline information to study the potential effects of subsidence in the North Lease area – primarily in the perennial reaches of Winter Quarters Canyon and Woods Canyon. This review addresses only hydrologic regulations germane to the current application; regulations not addresses are adequately addressed in the current Mining and Reclamation Plan (MRP). From a hydrologic perspective, the primary concerns were addressed in the November 2002 application, and only minor, time-sensitive modifications were made in the current application. The supplied information adequately addresses the minimum requirements of the regulations and incorporation into the currently approved MRP is recommended.

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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.

GEOLOGIC RESOURCE INFORMATION

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

Analysis:

No additional geologic information was submitted by Canyon Fuel Company (CFC) as part of the North Lease Subsidence Mining amendment.. However, additional information has been provided as part of the June 2004 PHC update (Kravits 2003). The information consists of 89 drill holes; 16 oil and gas exploration holes that penetrate the Starpoint Sandstone, 70 coal exploration holes which primarily terminate in the Storrs Sandstone or Panther Sandstone, and three (3) measured sections. This work has been provided to the Division on a CD. Additional geologic illustrations are available in Appendixes J and K, which were generated for the hydrologic modeling exercise.

Findings:

The information provided adequately addresses the minimum requirements of the Environmental Resource Information – Geologic Resources Information section of the regulations.

HYDROLOGIC RESOURCE INFORMATION

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

Analysis:

The primary hydrologic concerns in the North Lease area were addressed in the November 2004 Significant Revision to the MRP. However, special conditions outlined in Attachment A of the November 2002 analysis indicated that additional Division approval is necessary prior to full-extraction mining commencing.

Baseline Information

In Section 2.3.5.2 – Groundwater Rights, CFC clearly references the location of the water rights status. They are listed in Volume 4, 1st and 2nd binders, and illustrated on Plate 2.3.5.2-1. For the North Lease area, a total of seven (7) springs and one (1) stockwatering pond have been monitored and data submitted to the Division since fall 2002. Although not currently initiated, beginning six-months prior to longwall commencing and continuing for six-months after longwall mining passes any perennial sections of Winter Quarters and Woods Canyons, monthly flow monitoring will take place at nine (9) locations on Winter Quarters and two (2) locations on Woods Canyon. These nine (9) sites will give additional baseline flow data immediately prior to longwall mining to help analyze any diminution of flow.

Also included as baseline information and required based on the November 2002 analysis are three (3) reports: *EarthFax Engineering, Perennial Length and Gradient Studies of Winter Quarters Canyon and Woods Canyon Creek, 2003 and 2004*; *Riparian Plant Community Survey Near Scofield Utah, Winter Quarters and Woods Canyon, 2002*; and *Macroinvertebrates Studies, 2002 and 2003, Winter Quarters and Woods Canyon*, respectively. Copies of the studies are included in Volume A-1 Hydrology Section.

Baseline Cumulative Impact Area Information

In Section 2.5.3 – Alternative Water Supply, CFC has identified they currently own approximately 556 acre-feet of water rights in the Scofield Reservoir. In Section 2.5.3, CFC also commits to “correct any material damage resulting from subsidence caused to surface lands (which includes water rights), to the extent technologically and economically feasible, by restoring the land to a condition capable of maintaining the value and reasonably foreseeable uses that it was capable of supporting before subsidence damage”. Additional comments include, “Restoring of water flows to impacted sources will be accomplished using Best Technology Currently Available (BTCA)”. As a final alternative, the mine will “explore the transferring of water rights to the injured party in flow equal to the determined loss and/or monetary reimbursement of proven material damages”. The statements made will be implemented for water replacement should any damage occur.

Probable Hydrologic Consequences Determination

In Section 2.5.2, Mining Impacts on Water Quantity, CFC specifically discusses the subsidence study conducted in Burnout Canyon – with a discussion of the mining impacts on the aquatic resources found in Section 2.8. The purpose of the Burnout Canyon study was to determine the impacts of undermining perennial streams in the Skyline Mine area. The intent of the study was to determine if significant impacts would occur to water resources by undermining Burnout Stream, and help determine whether undermining of perennial streams could occur with similar geologic and geomorphic conditions. As of the September 2003 subsidence survey, two

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sections of Burnout Creek have subsided a total six (6) feet and eight (8) feet, respectively. The six-foot subsided section is located in an area of single-seam mining, while an 8-10 foot section is located in an area of two-seam mining. In both cases, the gradient of the stream has been lowered, but no disruption in flow or adverse affects to the aquatic resources have been observed. Mining takes place in the Lower O'Conner B and Upper O'Conner A coal seams, respectively. The overburden in both locations consists of approximately 600-feet of undifferentiated Blackhawk Formation.

As a guideline for undermining of perennial stream with longwall mining methods, the U.S. Forest Service (USFS) uses a ratio of overburden to mine extraction height of 60:1 (Peng, 1992). In both the Burnout Canyon area and the North Lease, the coal seam is roughly 10-foot thick (Lower O'Conner A in North Lease), indicating the critical overburden depth is approximately 600-feet. In Winter Quarters Creek, one area has only 400-feet of cover, but it is located in an area where the submains exist and no subsidence will occur. The rest of the area planned for longwall mining in Winter Quarters has overburden in excess of 600-feet. A portion of longwall panel 1R undermines Woods Creek where the overburden is approximately 550-feet. Results from the Burnout Canyon study and subsidence calculations suggest these areas will subside approximately 2-feet and likely reduce gradient, but it is unlikely a diminution of flow would occur.

Findings:

The information provided adequately addresses the minimum requirements of the Hydrologic Resource Information section of the 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:

Coal Resource and Geologic Information Maps

Drawings 2.3.4-1A through 1-C were updated in November 2002 to provide graphic representation in cross section of the North Lease area. Additional geologic information is available in the Kravits report (November 3, 2003) and generalized cross sections in Appendix K (Hydrologic Model report) Figures 9-12.

Findings:

The information provided adequately addresses the minimum requirements of the Maps, Plan, and Cross Sections of Resource Information section of the regulations.

OPERATION PLAN

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

No water monitoring sites have been added since November 2002. However, sites were implemented at that time which should adequately address the effects to the hydrologic regime from mining; both direct effects and effects caused by potential subsidence. Tables 2.3.7-1, 2.3.7-2, and 2.3.7-3 have been modified to include additional monitoring associated with the North Lease – samples are obtained at the monitoring sites three (3) times a year.

Groundwater Monitoring

A total of six (6) springs have been added to the groundwater-monitoring program for the North Lease area. Samples have been collected since 2002.

Surface Water Monitoring

A total of two (2) surface water sites, Woods and Winter Quarters Canyons have been added to the monitoring program to monitor both water quality and quantity three (3) time a year. Samples have been collected since 2002. In addition, a total of nine (9) flow-only monitoring sites will be monitored monthly on the same streams. This will be initiated 6-months prior to- and continue for 6-months after undermining perennial sections of the streams. This is being conducted to monitor any potential diminution of flow caused by subsidence.

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Findings:

The information provided adequately addresses the minimum requirements of the Operation Plan – Hydrologic Information section of the regulations.

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:

Mine Workings Maps

Provided in November 2002.

Monitoring and Sampling Location Maps

Plate 2.3.6-1 was updated in November 2002 to include six (6) additional springs and 2 stream sites in the water-monitoring program for the North Lease. The sites have been monitored 3-times a year since that time. Drawing 2.3.6-2 – North Lease Subsidence Hydrologic Monitoring Points was also added in November 2002 outlining seven (7) sites outlined to monitor flow-only six months prior to- and six months after mining to monitor any disruption of flow caused by subsidence.

Findings:

The information provided by CFC is adequate to meet the minimum requirements of the Utah Coal Mining Rules.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

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

Analysis:

The Division Cumulative Hydrologic Impact Assessment (CHIA) will be updated in the very near future based primarily on activities related to the southern portion of the Skyline Mine.

No additional hydrological impacts are anticipated with the addition of the North Lease.

Findings:

The information provided adequately addresses the minimum requirements of the Cumulative Hydrologic Impact Assessment section of the regulations.

RECOMMENDATIONS:

Incorporation of the proposed information into the currently approved MRP is recommended.

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