

#3996
R

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

January 23, 2012

TO: Internal File

THRU: Daron Haddock, Permit Supervisor

FROM: Steve Christensen, Environmental Scientist III *SKC*

RE: Change to Appendix 7-65, Genwal Resources, Inc., Crandall Canyon, C/015/0032, Task ID #3996

SUMMARY:

On January 6th, 2012 the Division of Oil, Gas and Mining (the Division) received a permit amendment from Genwal Resources Inc. (Genwal or the Permittee) with changes to Appendix 7-65 of the Crandall Canyon Mining and Reclamation Plan (MRP). This amendment was submitted to satisfy the abatement requirements for NOV 10073, issued to Genwal on February 16, 2011. The previous task associated with this amendment was Task ID #3941 which was returned to the Permittee on December 20th, 2011.

NOV 10073 was issued for the following:

The Permittee failed to comply with the terms and conditions of the approved Crandall Canyon Mining and Reclamation Plan (MRP). Commitments to provide summary/chronology information and operational costs associated with the mine-water treatment system at the Crandall Canyon Mine were not fulfilled. The information was not submitted for inclusion into the MRP within established deadlines.

The abatement actions for NOV 10073 were as follows:

- *Submit the summary/chronology information of the mine-water treatment system (as outlined on page 11 of Appendix 7-65) for inclusion into the Crandall Canyon MRP by March 16th, 2011. The submission must address outstanding deficiencies (listed for Experimental Treatment Design Information) identified in the February 16th, 2011 deficiency letter for Task ID #3714 and #3724 and be submitted under a notarized CI/C2 form.*

- *Submit an up to date summary of equipment costs and projected annual operations/maintenance costs for the current mine-water treatment system (as outlined on page 11 of Appendix 7-65) for inclusion into the Crandall Canyon MRP by March 16th, 2011. The cost information must be submitted in the example format provided (See Attached). Additionally, the cost information must address outstanding deficiencies (relative to the mine-water treatment system costs) identified in the February 16th, 2011 deficiency letter for Task ID #3714 and #3724 and be submitted under a notarized C1/C2 form.*

The permit amendment received January 6th, 2012 satisfies the abatement actions for NOV 10073 as well as additional deficiencies that were identified during the previous technical review (Task ID #3941) that were not directly related to NOV #10073.

The amendment is recommended for conditional approval. Final approval will be granted when the Division receives the required number of clean copies with the additional language added to page 15 of Appendix 7-65 (See discussion below).

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

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

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

The amendment meets the Subsurface Water Resource Map requirements of the State of Utah R645-Coal Mining Rules.

The previous technical analysis (Task ID #3941) had identified a deficiency relative to Plate 7-13, *Potentiometric Surface Spring Canyon Member Star Point Sandstone*. The Permittee had marked this plate for deletion on the table of contents. No explanation was provided as to why the plate was to be removed from the approved Mining and Reclamation Plan (MRP). The Permittee was directed to revise the Chapter 7, List of Plates Table of Contents to show that Plate 7-13, *Potentiometric Surface Spring Canyon Member Star Point Sandstone* is not to be deleted.

In the cover letter provided with this amendment, the Permittee discusses how Plate 7-13 was approved for deletion by the Division on April 15th, 2005, but that the table of contents was never revised to reflect that deletion. The Permittee provided a copy of the stamped incorporated copy of page 7-2 that discusses the deletion of Plate 7-13.

Findings:

The information meets the Subsurface Water Resource Map requirements of the State of Utah R645-Coal Mining Rules.

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:

Other Treatment Facilities

The Division identified by letter on February 16, 2011 numerous deficiencies associated with the amendment to MRP Appendix 7-65 received by the Division on December 14, 2010 and reviewed under Task ID No. 3714. The letter directed the Permittee to respond to the deficiencies not associated with the Probable Hydrologic Consequences (PHC) revision (Task ID No. 3724). The amendment received on May 26, 2011 as well as the previous amendment (Task ID #3941) did not address the summary/chronology commitments established in Appendix 7-65. The outstanding items were as follows:

A summary/chronology of the experimental process that led to the final design including:

A summary of the various treatment methods that were examined/tested.

A discussion as to the chemical additives that were employed during the trial and error process. The discussion shall include the ratios of chemicals that were utilized in the various test configurations as well as the corresponding water quality results.

An up to date tabulation of the mine-water flow data that was been collected since the installation of the AVF Flow Meter.

The field data and lab analytical results that were obtained during the various test configurations/water treatment approaches that were explored.

Based upon numerous conversations with the Permittee, detailed information/notes were not kept during the construction of the treatment basin. The treatment system was primarily the result of trial and error based on recommendations from company personnel in the eastern United States. As a result of the trial and error nature of the current treatment system configuration, detailed design information/considerations are not available.

In addition to the summary/chronology information discussed above, the Permittee was directed to provide experimental treatment design information. A deficiency was identified relative to this information in the February 16th, 2011 Division letter to the Permittee as well as subsequent technical reviews. The requested information included the following:

Treatment Technology Screening

- Consultant reports and descriptions for technology screening, if any, prior to selection of oxidizer unit
- Oxidizer(Maelstrom) unit bench testing information
- Consultant reports from the three Geotube companies and one press company to which sludge samples were sent July 2010
- Consultant reports describing successful "Geobag" testing completed October 2010, including Geobag specifications, operating conditions, concentrations and types of additional treatment chemicals employed.
- Consultant report(s) for cyclone testing completed 11/5/2010 (type of cyclone and operation settings)

Chemical Additives

- Concentrations of treatment chemicals used:
 - 2/24/2010 - Sodium Hydroxide (NaOH)
 - 2/25/2010 - Nalco 7763 plus NaOH
 - 3/15-16/2010 - Nalco 7763 and Nalco 7888 (8187)
 - 3/19/2010 - Nalco 8158
 - 3/25/2010 - NeoSolutions 18100
 - 4/16/2010 - Nalco 8187
 - 10/20/2010 - Solve 151
- Consultant reports and analytical results for polymer testing results from Nalco and WaterSolve.

Field Data and Lab Analytical Results

- Field measurements (sludge settling times, field-measured iron concentrations, turbidity measurements, etc.) used to evaluate treatment effectiveness
- Laboratory analytical results for samples analyzed to evaluate treatment effectiveness

Mine-water Flow Data

- Date that the flow meter used for Outfall 002 was first suspected or known to be malfunctioning.

Sludge Disposal

- Volume sludge sent to Crandall Sediment pond between July 19 and August 23, 2010
- Specific dates and volume of sludge sent to Crandall sediment pond November 2010.

As with the summary/chronology information discussed above, the Permittee is unable to

provide the information as it was not collected in sufficient detail.

The Permittee was directed to revise the amendment to identify: the concentration of flocculant prepared in the make-down unit; and the sludge recirculation rate being used under current operating conditions. Beginning on page 4 of Appendix 7-65, the Permittee discusses the make-down unit and sludge recirculation process. The Permittee indicates that "*Presently (January, 2012), the flocculant is being prepared in the make-down unit at a concentration of 0.25%*". Additionally, the Permittee indicates on page 5 of Appendix 7-65 that the sludge recirculation rate is approximately 500 gallons per minute (gpm).

A previously identified deficiency directed the Permittee to provide a commitment that only treatment chemicals certified under NSF60 will be utilized for the mine water treatment system, and that monitoring will be conducted for Genwal will monitor the dosage rate (in mg/L) for all treatment chemicals used. On page 3 of Appendix 7-65, the Permittee commits to only utilizing "*treatment chemicals certified under NSF60*" and that "*the company will monitor the dosage rates (in mg/L) for all treatment chemicals used*". Additionally, the Permittee states, "*The company will monitor treated water for carryover of treatment chemicals on a monthly basis or when dosage rates or chemical produces are changed. Dosage rates will not exceed the NSF60 certified concentrations without a prior demonstration to the Division, Forest Service and DWQ that elevated dosage rates are acceptable based on analytical results for treated water samples*".

A previous technical analysis of Appendix 7-65 revisions had identified a deficiency relative to the cleanout operations of the iron sludge treatment basin. The Permittee was also directed to provide criteria to be utilized in determining when the sludge needed to be removed from the treatment basin. On page 7 of Appendix 7-65, the Permittee indicates that the cleanout operations of the treatment basin are conducted on an "*as needed basis*". The amendment indicates that, based on historical experience to date, the basin "*may require regular cleanout approximately once every several months*". Based upon observations by Division staff, cleanout operations have historically been conducted every other month and been conducted on the entire pond (i.e. a thorough clean-out of the entire treatment basin). In recent months, the Permittee has indicated that clean-out operations were being focused primarily on the 2nd and 3rd cells of the pond and being conducted for approximately 6-7 hours a day every day.

On page 14 of the previously submitted amendment (Task ID #3941), the Permittee revised the language in the Temporary Use of Crandall Sediment Pond section. The Permittee had removed the October 30th, 2010 end date for use of the Crandall sediment pond for treatment basin cleaning and replaced it with "*as authorized by the Division*". The Permittee was directed to retain the approved language located in the last sentence of the 3rd paragraph on page 14 (Temporary Use of Crandall Sediment Pond section) and re-establish the October 30th, 2010 end date for utilization of the sediment pond for iron sludge disposal. The Permittee has re-established the October 30th, 2010 end date for usage of the primary sediment pond. The approved MRP identifies an end date of October 30th, 2010 for utilization of the Crandall

sediment pond during clean-out operations of the mine-water treatment basin. The language was established in July of 2010 to allow for experimentation of various sludge clean-out techniques. Since October 30th, 2010, the Division has allowed the routing of treated mine-water sludge to be routed to the primary sediment pond with the understanding that a permanent storage location/facility was in the process of being permitted on nearby SITLA land. On at least three different occasions, the Division has allowed utilization of the primary sediment pond for sludge disposal on a case-by-case basis.

On June 13th, 2011, the Permittee submitted a request (via e-mail) to utilize the primary sediment pond for iron sludge disposal. The Permittee indicated that the request was a “*temporary permission situation*” and that submission of a permanent storage facility application would be submitted by the end of June 2011 (the Division received the application for the permanent storage facility on January 12th, 2012). In response to the June 13th, 2011 request to temporarily utilize the primary sediment pond for iron sludge disposal, the Division issued a letter to the Permittee (dated June 16th, 2011). The letter granted the Permittee’s request to temporarily use the primary sediment pond. The approval was stipulated on the Permittee utilizing the methods described in Appendix 7-65 for conducting clean-out operations on the treatment basin as well as providing the Division with revisions to Appendix 7-65 to reflect current conditions (i.e. that Wildcat Loadout was no longer available for sludge disposal).

The most recent amendment received from the Permittee references the June 16th, 2011 Division approval for temporary use of the sediment pond and discusses how SITLA approval for the permanent storage facility had not been granted. It is the Division’s understanding (based upon conversations with SITLA representatives as well as the Permittee) that the permitting process with SITLA for the permanent storage facility has been completed and access granted. Additionally, the Division (as mentioned previously) received an amendment for the permanent storage facility on January 12th, 2012.

The deficiency letter for the previous analysis (Task ID #3941 dated December 20th, 2011) indicated that “*continued utilization of the primary sediment pond for purposes of storing the mine-water treatment sludge is no longer authorized by the Division*” and that “*Any use of the primary sediment pond, other than its designed purpose of sediment control/storm-water runoff, will result in enforcement action.*” However; given that the construction of the permanent storage facility (Burma Evaporation Basin) constitutes a significant revision to the approved Crandall Canyon MRP; the permitting requirements are more rigorous and more time consuming.

In light of this, the Division finds that the language on page 15 of Appendix 7-65 should be revised to reflect current conditions (i.e. granting of final approval by SITLA for the special use permit) and provide a commitment (based upon final Division approval of the Burma Evaporation Basin) for the construction and operation of the permanent storage facility.

As a result, the language contained in the 2nd full paragraph on page 15 of Appendix 7-65 must be revised prior to final approval of the amendment. The Permittee must provide a commitment that within 60 days of final approval of the Burma Evaporation Basin (Task ID #3997), the site will be constructed and operational. A sentence must also be added acknowledging that within 60 days of the final approval of the Burma Evaporation Basin, that continued utilization of the Crandall Canyon sediment pond for iron sludge disposal will no longer be authorized by the Division. Additionally, the last sentence of the 2nd full paragraph of page 15 of Appendix 7-65 should be revised to reflect the final approval date granted by SITLA for the Burma Evaporation Basin special use permit.

A previous technical analysis (Task ID #3827) had identified a deficiency relative to descriptions of the water treatment system as a "*mechanically simple system*". The Permittee was directed to remove such references given the sheer number of components of the mine water treatment system. In addition, the Permittee was to provide a description/demonstration that necessary repairs to the mine-water treatment system could be accomplished within an 8-hour window. On page 9 of the amendment, the Permittee discusses the various redundancies and extra components on site. The Permittee indicates that spare pumps, a spare make-down unit and a back up flow meter are on the site. In addition, the system is monitored continuously by a computer interface. The computer system provides off-site monitoring capability and allows for company personnel to keep apprised of system operations in real time in a remote location.

The Permittee was also directed to remove the discussion of ongoing baseline water monitoring associated with the mine water discharge and groundwater seepage from the highwall face section and place that discussion in Section 7.31.2 of the approved MRP. The Permittee has revised pages 7-40 and 7-41 to reflect the monthly monitoring of the mine discharge (Pre-002) as well as the ledge seep water flow. However, in the previous amendment (Task ID #3941) the Permittee indicated that the monthly flow measurements obtained from the ledge seep water would be reported to the Division via e-mail. The data is currently being provided electronically into the Division's Water Monitoring Database. The Permittee was directed to revise the ledge seep water flow discussion on page 7-41 to indicate that the monthly flow measurements will be submitted to the Division via the electronic water monitoring database. The highwall seep flows have been submitted to the Division electronically (via the database) since April of 2010. The Permittee has revised page 7-41 to reflect the electronic submission of water monitoring data from the ledge seep.

A previous technical analysis (Task ID #3827) had directed the Permittee to update Attachment 8, Construction Specifications and Drawings, to accurately reflect the installation of all aspects of the water treatment system. Additionally, the Permittee was directed to revise the *Iron Treatment Facility As-Built Plan* to accurately reflect the current conditions of the mine-water treatment facility. On page 3 of Appendix 7-65, the Permittee provides a detailed discussion of the current configuration of the mine-water treatment system. Additionally, the figures in Attachment 8 (Iron Treatment Facility, As-Built Plan and Mine-Water Treatment As-Built Flow Diagram) have been revised to accurately reflect the current configuration of the mine-water treatment system.

Findings:

The information conditionally meets the Hydrological Information requirements of the Utah R645 Coal Mining Rules. The Permittee must revise the language contained in the 2nd full paragraph on page 15 of Appendix 7-65 prior to final approval of the amendment. The Permittee must provide a commitment that within 60 days of final approval of the Burma Evaporation Basin (Task ID #3997); the site will be constructed and operational. A sentence must also be added acknowledging that within 60 days of the final approval of the Burma Evaporation Basin, that continued utilization of the Crandall Canyon sediment pond for iron sludge disposal will no longer be authorized by the Division. Additionally, the last sentence of the 2nd full paragraph of page 15 of Appendix 7-65 should be deleted as final approval for the special use permit has been granted by SITLA for the Burma Evaporation Basin site.

RECLAMATION PLAN

BONDING AND INSURANCE REQUIREMENTS

Regulatory Reference: 30 CFR Sec. 800; R645-301-800, et seq.

Analysis:

Determination of Bond Amount

The application meets the Bonding and Insurance Requirements of the State of Utah R645-Coal Mining Rules and satisfies the cost information requirement of NOV #10073. The abatement actions for NOV #10073 included the submission of equipment costs and projected annual operations/maintenance costs for the current mine-water treatment system for inclusion into the Crandall Canyon MRP. The cost information was required to include the following line items:

- Equipment costs (capital)
- Chemical costs (annual)
- Sludge cleanout, transportation, and disposal costs (annual)
- Electricity, propane and water costs (annual)
- Operational Labor (annual)
- Maintenance Labor (annual)

In the May 26, 2011 submittal (Task ID #3827), Genwal provided cost information for equipment, operations (including treatment chemicals and facilities) and maintenance (including

sludge cleanout and disposal). The cost information was submitted under a notarized signature which is required in order for the Division to consider it's incorporation into the approved MRP.

Although the Division identified several areas that required reconciliation, the submittal of the cost information met the abatement requirement for NOV #10073. However, due to other deficiencies identified during that technical analysis (Task ID # 3827), the cost information was never approved. The previous amendment (Task ID #3941) did not contain the cost information as the question of annual operating costs/bonding of the mine-water treatment facility is currently under review by the Board of the Utah Division of Oil, Gas and Mining. The current amendment does contain the stipulated cost information in Attachment 11.

Findings:

The amendment meets the Determination of Bond Amount requirements of the State of Utah R645-Coal Mining Rules.

RECOMMENDATIONS:

The amendment is recommended for conditional approval at this time.