

# TECHNICAL MEMORANDUM

## Utah Coal Regulatory Program

---

July 27, 2009

TO: Internal File

THRU: Ingrid Wieser, Team Lead *IWW*

FROM: Priscilla Burton, CPSSc, Environmental Scientist III *PWB by SCS*

RE: Catchment Structures, West Ridge Resources, West Ridge Mine, C/007/0041, Task ID #3309

### SUMMARY:

After field evaluation of the temporary structures placed in a tributary of Grassy Trail creek (see NOV 10033 and previous review under Task 3257), the Permittee, BLM and DOGM jointly determined that four catchments should remain long term. This catchment structures are described in Appendix 5-15 to the Mining and Reclamation Plan. The reclaimed channel design was not been adequately described.

**R645-301-742.313**, Designs should be provided for the reclaimed channel bottom and banks, including profile and plan views and cross-sections. The channel reclamation designs should describe the bedding material and the D<sub>50</sub> size for the channel rock. The channel reclamation plan should describe embedding the channel rock into the regraded channel bottom. The channel reclamation plan should describe the use of bioengineering techniques, such as vortex weirs, drop structures, brush revetments and plant cuttings to provide stability. The following website is a good resource for streambank reclamation:  
<http://plait-materials.nrcs.usda.gov/idpmc/streambank.html>

**R645-301-121.200**, Table 1-3 records an increase of 41.02 acres for one of the four catchment sites. This should likely be 0.23 acres as stated in the narrative for each site. The total increase in acreage reported on page 1-6 and 1-10 of the application should be corrected accordingly.

TECHNICAL MEMO

---

**TECHNICAL ANALYSIS:**

**GENERAL CONTENTS**

**RIGHT OF ENTRY**

Regulatory Reference: 30 CFR 778.15; R645-301-114

**Analysis:**

The un-named intermittent stream affected by the mine discharge is tributary to Grassy Trail Creek. The flow in the intermittent stream is constant at 800 gpm, due to the mine water discharge (Task 3257 Abatement plan p.3). The intermittent stream flows through Clark's Valley. The location in T. 14 S., R. 13 E. Sections 15, 21, 26, and 29; and T. 15 S, R. 12 E. Sec. 3 is shown on Attachment 2 of Appendix 5-15. BLM Right of entry UTU-87111 for catchments A, C, E, and F are provided in Attachment 3 of Appendix 5-15. the BLM ROE expires in 2012, but may be extended.

Temporary access across SITLA lands to catchments E and F is granted by Right of Entry agreement #5281 (Attachment 4 of Appendix 5-15).

The Channel alteration permit is included in Attachment 5 of Appendix 5-15.

**Findings:**

The information provided meets the Right of Entry requirements of the Utah Coal Rules.

**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:**

Limited information is available about the vegetation and soils of the riparian zone and stream channel bottom. Pre-construction photographs have been included as Attachment 8 of Appendix 5-15, to provide some information about the stream corridor, in compliance with R645-301-750.

The river distance between the four catchment basins is unknown.

**Findings:**

The information provided meets the minimum requirements for baseline information.

## **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:**

#### **Acid- and Toxic-Forming Materials and Underground Development Waste**

Analysis of the sludge accumulated by the catchment structures is provided in Attachment 11 of Appendix 5-15. The chemical characteristics of the Total Suspended Solids in the mine discharge water are represented by one sludge sample, which was taken from the stream channel in the vicinity of catchment A.

America West Analytical labs in Salt Lake City analyzed for total metals using EPA methods. The laboratory analysis sheet specifies the method used for analysis of the metals. In a telephone conversation on April 30, 2009, America West Analytical Labs stated that the sample was 66% moisture and confirmed that the water was not separated off in preparation, but the entire sample was digested. Subsequent reporting in mg/kg solid was corrected by the amount of water in the sample. The pH of the sludge was 7.92 and the conductivity was reported as 0.87 mmhos/cm. Attachment 11 indicates that 75% of the particles are < 200 mesh, which should be considered in the design of the catchment filtration structures.

DOGM contacted the Utah DEQ to discuss burial of the waste from the catchments on a permitted mine site. This notification was in accordance with the MOU and with R315-

---

TECHNICAL MEMO

---

2.4(a)(2), which states that sludge generated from a point source discharge is regulated by the Utah DEQ. According to Robert Blake, (email communication April 28, 2009), the eight metals monitored under RCRA (As, Ba, Be, Cd, Cr, Pb, Hg, Ag) do not exceed contaminant levels for hazardous waste, because the total metal analysis values divided by 20 approximate the water extract values obtained by the Toxicity Characteristic Leaching Procedure (TCLP, upon which EPA's hazardous waste concentration limits in 40 CFR 261.24 are based.) Other metals of concern in the sludge are: Al @ 6,100 mg/kg and Fe @ 18,000 mg/kg. The concentrations of aluminum, zinc and nickel may be of concern for surface water, except that the water flow does not reach Grassy Trail Creek (personal communication with Jeff Studenka, April 28, 2009). Total petroleum hydrocarbons was reported as 3,600 mg/kg, also a concern for surface waters.

Boron and selenium values reported in Attachment 11 exceed the DOGM suitability limits for water extraction methods, but were based upon SW6020 total metals analysis. For example, the selenium value of 3.7 mg/kg is based upon a total metal analysis, not water extraction. The total boron value was reported as <150 mg/kg, not water soluble boron. Using the 20:1 equivalency described above, the equivalent TCLP values of 0.185 mg/kg Se and 7.5 mg/kg B still exceed Division guidelines for the surface four feet of rooting zone (2008 Guidelines for Topsoil and Overburden, Table 8). The SAR value could not be calculated from the total metal digest values provided for Mg, Na, and Ca ions. Based upon information provided, the Division finds that the sludge material must be kept out of contact with groundwater and surface water and buried under four feet of fill. The reclamation plan described in Appendix 5-15 pp. 4-5 is in accordance with this requirement. The reclamation also indicates that further sampling will be conducted in accordance with Tables 3 & 7 of the Division's January 2008 Guidelines for Management of Topsoil and Overburden.

The spent excelsior logs will be disposed of at the East Carbon waste disposal site.

**Findings:**

The information provided meets the requirements for acid-toxic monitoring and burial of the Utah Coal Rules (R645-301-731.300).

## **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:**

Appendix 5-15, pp. 8-9 describe reclamation of the four catchment basins as per BLM requirements in the ROE document. The application describes replacement of "boulders in and along the channel" for stability and erosion control. The channel reclamation plan should describe the D<sub>50</sub> size for the channel rock. The channel reclamation plan should describe embedding the channel rock into regraded soil.

Topsoil was used to construct the access roads and will be redistributed over the site (Attachment 13, email from Dana Truman to Dave Shaver, 06/03/2009).

Two seed mixes for the regraded sites are provided in Attachment 13. Seed will be hand broadcast and raked in. Wood straw will be scattered over the site.

**Findings:**

**R645-301-742.313**, Designs should be provided for the reclaimed channel bottom and banks, including profile and plan views and cross-sections. The channel reclamation designs should describe the bedding material and the D<sub>50</sub> size for the channel rock. The channel reclamation plan should describe embedding the channel rock into the regraded channel bottom. The channel reclamation plan should describe the use of bioengineering techniques, such as vortex weirs, drop structures, brush revetments and plant cuttings to provide stability. The following website is a good resource for streambank reclamation:

**<http://plant-materials.nrcs.usda.gov/idpmc/streambank.html>**

**RECOMMENDATIONS:**

The reclamation plan should be based upon hydrologic parameters and should provide a designed D<sub>50</sub> for the channel rock.