

WATER QUALITY MEMORANDUM

Utah Coal Regulatory Program

March 25, 2010

TO: Internal File

THRU: James D. Smith, Permit Supervisor *DS 29 Mar 10*

FROM: Steve Christensen, Environmental Scientist *SKC*

RE: 2009 First Quarter Water Monitoring, West Ridge Resources, West Ridge Mine, Task ID #3241

The West Ridge Mine is currently operational in the Book Cliff Mountain range of Carbon County, UT. Water monitoring data is submitted quarterly to the Division EDI database. Beginning on page 7-34 of the approved Mining and Reclamation Plan (MRP), water monitoring protocols and sampling requirements are provided for surface water, ground water, monitoring wells and UPDES outfalls in Tables 7-1, 7-2, 7-3 and 7-4 respectively.

1. Was data submitted for all of the MRP required sites? YES NO

Springs

The approved MRP outlines the monitoring of 10 springs. Four of the springs (SP-12, SP-13, SP-15 and SP-16) discharge from the lower slopes of West Ridge in Whitmore Canyon. Two springs (WR-1 and WR-2) discharge from the upper slope of West Ridge in Whitmore Canyon. One spring (SP-8) discharges in the upper drainage of C Canyon. Hanging Rock Spring (S-80) is located near the northwest corner of the permit area and discharges from the east slopes of Whitmore Canyon. Spring 101 monitors Little Spring at the bottom of West Ridge. Spring 102 is located within Spring Canyon.

Data was submitted for all 10 spring monitoring sites.

Streams

The approved MRP outlines the monitoring of 12 stream sites. Grassy Trail Creek is the only perennial stream in the permit and adjacent areas. Operational sampling is required quarterly for six stream sites (ST-3, ST-8, ST-9, ST-10, ST-13 and ST-15). Four sites (ST-5, ST-6, ST-6A and ST-7) are equipped with automatic samplers that are required to be checked

following precipitations events. Sites ST-11 and ST-12 were added to the water-monitoring program based upon field inspections conducted in 2005. The field inspections were conducted as part of a proposed lease expansion by the Permittee. At the time of the inspections, the Bear Canyon drainage had exhibited measurable flow. As a precaution, sites ST-11 and ST-12 were established within that drainage. Since that time (summer of 2005) neither site has produced appreciable/measurable flow. However, the sites remain as part of the surface water monitoring program and are inspected quarterly.

Data was submitted for all 12 stream monitoring sites.

Wells

Operational sampling is required quarterly for one groundwater monitoring well (Site DH 86-2).

Monitoring well DH 86-2 was sampled during this quarter and all required data submitted.

UPDES

Operational sampling is required monthly for two active UPDES sites (Permit # UT0025640). Site D001 is the mine sites primary sediment pond discharge to the ephemeral 'C' Canyon drainage. Site D002 is the mine-water discharge to the ephemeral 'C' Canyon drainage. Specific limitations and self-monitoring requirements as outlined in the UPDES permit are presented in the table below:

Effluent Characteristics	Effluent Limitations
Flow, MGD (million gallons per day)	1.0
Total Suspended Solids (TSS), ppm	70
Total Iron, ppm	1.3
Oil & Grease, ppm	10
Total Dissolved Solids (TDS), ppm	2,000
pH	9

The Permittee submitted all required samples per the terms of the UPDES discharge permit.

2. Were all required parameters reported for each site? YES NO

Surface Water Monitoring Sites: All required parameters were reported for sites with measurable flow.

Groundwater and Well Monitoring Sites: All required parameters were reported for sites that measurable flow.

UPDES: Site D001 did not produce any discharge during this quarter. All required parameters were reported for Site D002.

3. Were any irregularities found in the data? YES NO

Surface Water Monitoring Sites- The following irregularities were found in the reported surface water monitoring data:

ST-5- During the previous four quarters, flow values (with the exception of the 3rd quarter of 2008) have been trending upward (762.96 ppm, 897.6 gpm, 3.5 gpm and 1,570 gpm respectively). The reported flow value of 987.36 gpm for this quarter is above two standard deviations of the mean value of 133.22 gpm. Mine-water discharge is the primary source of water at this monitoring point. As a result of changing conditions underground in the mine works, the flow trends at this monitoring point have been erratic over time. Although the flow is trending upward at a significant rate, the remaining parameters have remained within historical trends.

ST-6- Flow values for ST-6 have been trending significantly upward in the previous 2 quarters (1436.16 gpm and 1,570.8 gpm). The reported flow value for this quarter was again outside of two standard deviations with a reported flow value of 964.92. Based on field inspections, it appears that the flow is essentially all mine-water discharge.

In addition to increased flow values, Dissolved Potassium and Bicarbonate were outside of two standard deviations (2.14 STD and 2.04 STD respectively). Continued monitoring will be conducted to detect if, in addition to flow values, any other parameters are trending upward. Historically, the mine-water discharge has shown erratic fluctuations as conditions underground change and the encountered flows must be re-directed.

ST-10- Several parameters were reported outside two standard deviations during the third quarter of 2008. TSS, TDS, Cat-An PC Diff, and T-Fe values were significantly higher. Based upon rainfall data, it appeared that the elevated levels were caused by a large rainfall event prior to sampling. However, it's not precisely known if the rainfall event was the cause for these elevated samples as no flow was reported at monitoring ST-10 during both the 4th quarter of 2008 and now the 1st quarter of 2009.

Groundwater Monitoring Sites- Several irregularities were found in the reported groundwater monitoring data:

SP101- Dissolved Magnesium (D-Mg) was out by 2.33 standard deviations with a mean value of 50.85 ppm and a reported value of 54.74 ppm during the 4th quarter of 2008. Due to weather conditions, the site was inaccessible this quarter.

SP-12- Total Dissolved Solids (TDS) was out by 2.27 standard deviations with a mean value of 458.44 ppm and a reported value of 567 ppm during the 4th quarter of 2008. Due to weather conditions, the site was inaccessible this quarter.

SP-13- Several reported parameters were reported outside two standard deviations from the data set during the 4th quarter of 2008.

- Dissolved Calcium (D-Ca) was out by 2.32 standard deviations with a mean value of 44.55 ppm and a reported value of 60.92.
- D-Mg was out by 2.33 standard deviations with a mean value of 73.19 and a reported value of 104.5 ppm.
- Dissolved Sodium (D-Na) was out by 2.17 standard deviations with a mean value of 40.33 ppm and a reported value of 72.59 ppm.
- Sulfate (SO₄) was out by 2.23 standard deviations with a mean value of 153.59 ppm and a reported value of 271 ppm.
- Total alkalinity (T-Alk) was out by 2.07 standard deviations with a mean value of 358.30 ppm and a reported value of 433 ppm.
- Total Hardness (T-Hardns) was out by 2.34 standard deviations with a mean value of 412.61 ppm and a reported value of 582.45 ppm.
- Total Dissolved Solids (TDS) was out by 2.27 standard deviations with a mean value of 549.14 ppm and a reported value of 818 ppm.
- Total cations (T-Cats) were out by 2.29 standard deviations with a mean value of 10.44 meq/L and a reported value of 14.85 meq/L.

Due to weather conditions, the site was inaccessible this quarter.

SP-16- TDS was out by 2.49 standard deviations with a mean value of 425.83 ppm and a reported value of 487 ppm during the 4th quarter of 2008. Due to weather conditions, the site was inaccessible this quarter.

WR-1- Field pH was out by 2.86 standard deviations with a mean value of 8.2 and a reported value of 6.7 during the 4th quarter of 2008. Due to weather conditions, the site was inaccessible this quarter.

Monitoring Well DH 86-2 reported two values outside two standard deviations during the 4th quarter of 2008.

- Water Temperature was out by 2.21 standard deviations with a mean value of 13.95 degrees C and a reported value of 9.5 degrees C.
- Chloride (CL) was out by 2.10 standard deviations with a mean value of 90.01 ppm and a reported value of 300 ppm.

The reported values for temperature and Chloride this quarter were back to within two standard deviations and once again tracking with historic trends.

WR-2 had reported an elevated concentration of D-Na beyond two STD during the 2nd quarter of 2008 (33.77 ppm). The spring did not produce a measurable flow during the 3rd and 4th quarters of 2008. The site was inaccessible this quarter due to weather conditions. As such, it's uncertain as to what may have caused the elevated D-Na concentrations at this monitoring point.

UPDES Sites-

Site D001 (primary sediment pond at mine site) did not discharge this quarter.

During the 1st quarter of 2008, Site D002 (mine-water discharge) reported a total suspended solids (TSS) value of 103 ppm, which exceeded the 70 ppm standard established in the Permittee's UPDES Discharge Permit (# UT0025640). However, based upon 3 reported sampling events during the 2nd quarter of 2008, the TSS levels had returned to within compliant levels (7 ppm, 18 ppm and 14 ppm respectively). Based upon discussions with the Permittee, a sump pump in the underground workings was inadvertently allowed to pump untreated water to the surface.

During the 3rd and 4th quarters of 2008, all required parameters were reported and were within two standard deviations of the data set mean (including TSS) and within the compliance levels established in the UPDES discharge permit.

Out of six sampling events, one reported value for TSS was above two standard deviations for this quarter. The value, 53 ppm, is within the compliance limit of 70 ppm established by the UPDES discharge permit, however it is out of 2 standard deviations.

The Permittee notified the Division in January of 2009 to report that coal fines had been accumulating within the C Canyon drainage as a result of the mine-water discharge. On January 1st, 2009, Division Inspector Steve Demczak issued a Notice of Violation (#10033) for "additional contributions of sediment to stream flow outside the permit area". Coal fines had not been contained within the disturbed area and were being deposited within approximately 2.5 miles of the outlet of UPDES Outfall 002.

Division personnel conducted a site visit on February 12th, 2009 with the Mr. Dave Shaver (West Ridge Resources, Inc.). Mr. Shaver indicated that the mine-water was being pumped into the southwest portion of the mine that had been previously sealed. The water was then pumped into the C Canyon drainage. Mr. Shaver further stated that mine personnel were working to divert the water into a different part of the mine in hopes of reducing the coal fines discharging to the surface.

Mr. Shaver proposed to clean up the accumulated coal fines by utilizing a series of catchment basins and a team of laborers to "sweep" the fines downstream towards the basins. Mr. Shaver will submit the final clean-up plan to the Division. At this time, the Division will view the clean-up plan as a short-term abatement. However, the Division will permit the clean-up area if the catchments are to remain in place for a longer period of time (i.e. approximately greater than 1 year).

On February 10th, 2009 the Division of Water Quality (DWQ) also issued a violation for not meeting compliance levels for TSS and T-Fe at outfall D002 (mine-water discharge point). Based on 6 sampling events, the standard for T-Fe of 1.3 ppm was exceeded three times during this quarter (1.423 ppm, 1.478 ppm and 1.824 ppm). Additionally, the 30 ppm standard for TSS was exceeded with a reported value of 53 ppm.

4. On what date does the MRP require a five-year re-sampling of baseline water data.

On page 7-35 of the approved MRP, the Permittee commits to collecting baseline samples *"from each spring in the monitoring program during the low flow (fall) sampling and from each stream monitoring sites during low flow every five years beginning with the first mid-term review."*

The Division initiated the last mid-term review on November 9th, 2006. As such, baseline sampling of ground and surface water sites will be required during the 3rd quarter of 2011.

5. Based on your review, what further actions, if any, do you recommend?

Continue to monitor the data irregularities cited above for any trends. Work with the Permittee in developing a mitigation/clean-up plan for the coal fine accumulations within the C Canyon drainage.

6. Does the Mine Operator need to submit more information to fulfill this quarter's monitoring requirements?

YES NO

7. Follow-up from last quarter, if necessary. Did the Mine operator submit or provide an explanation for missing and/or irregular data?

YES

NO

O:\007041.WR\Water Quality\WQ09-1.doc



Coal Fine Accumulations Within the C Canyon Drainage



Coal Fine Accumulations Within the C Canyon Drainage

UPDES Outfall D002: TSS (ppm)

