

WATER QUALITY MEMORANDUM

Utah Coal Regulatory Program

June 22nd, 2015

TO: Internal File

THRU: Daron Haddock, Permit Supervisor

FROM: Steve Christensen, Environmental Scientist 

RE: 2014 4th Quarter Water Monitoring, West Ridge Resources, West Ridge Mine, Task ID #4754

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 7-36 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 8 springs (SP-8, SP-12, SP-13, SP-101, SP-0102, Road Spring, Section 5 Spring and SP-80). Two of the monitored springs (SP-12 and SP-13) discharge from the lower slopes of West Ridge in Whitmore Canyon. 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.

Data was submitted for all 8 of the spring monitoring sites that were accessible. Road Spring and SP-12 did not produce a measurable flow. Spring monitoring sites SP-80 and SP-8 were not accessible due to weather conditions/snow.

Streams

The approved MRP outlines the monitoring of nine stream sites (ST-3, ST-6, ST-8, ST-15, Patterfore, LF-1, LF-2, RF-1 and RF-2). Until the 2nd quarter of 2011, the surface water monitoring plan had included twelve stream monitoring sites; however, an amendment was submitted and approved by the Division (Task ID #3738) in March of 2011 that eliminated five of the sites. The amendment eliminated the monitoring of ST-5, ST-6A, ST-7, ST-11, ST-12 and ST-13. As a result, the monitoring of these stream sites was discontinued the 2nd quarter of 2011.

Grassy Trail Creek is the only intermittent/perennial stream in the permit and adjacent areas. The upper drainages of Grassy Trail Creek (i.e. the Left and Right Fork) are monitored quarterly.

Four monitoring sites have been established on the Left Fork (LF-1, LF-2, ST-3 and ST-15). Monitoring sites LF-1 and LF-2 are flume sites where continuous monitoring data is obtained during mid- to high-flow periods. During the late summer months, the flows of the Left and Right Forks of Whitmore Canyon decrease to a volume that cannot be measured accurately by the flumes. Site ST-15 monitors flow from the Spring Canyon drainage (tributary to the Left Fork).

Three monitoring sites have been established on the Right Fork (RF-1, RF-2 and Patterfore Stream). RF-1 and RF-2 are flume sites where continuous monitoring data is obtained during mid- to high-flow periods. The Patterfore Stream is a tributary to the Right Fork and was established as a monitoring site in the spring of 2011 in order to obtain additional data on the Right Fork drainage.

Continuous flow readings on the Left and Right Forks of Whitmore Canyon (LF-1, LF-2, RF-1 and RF-2) were submitted for this quarter. Flows are typically obtained during the high-flow (late spring/early summer months i.e. 2nd quarter) and during the summer (3rd quarter) when flows are of sufficient volume to produce an accurate measurement (given the limitations of the flume).

No observable flow was noted at stream monitoring sites LF-2, ST-3 and ST-15. Flow and water quality measurements were obtained from the other stream monitoring sites.

Wells

Quarterly operational sampling is required for one groundwater-monitoring well (Site DH 86-2). Monitoring well DH 86-2 was sampled during this quarter.

Underground Mine-Water Sample (UG-1)

Monthly samples of the underground, pre-treatment mine water are required. The requirement was established on August 24th, 2010.

The required monthly samples were submitted for this quarter.

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	1.0
Oil & Grease, ppm	10
Total Dissolved Solids (TDS), ppm	2,000
pH	9

Outfall 001 did not report a discharge this quarter. Data was submitted for UPDES Outfall 002.

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

Spring Monitoring Sites: All required data was reported for the spring monitoring sites that were accessible and produced a flow.

Surface Water Monitoring Sites: Of the stream monitoring sites that had a measurable flow and were accessible, the required data was submitted to the Division.

Well Monitoring Site DH 86-2: The monitoring well was sampled this quarter. The required data was submitted.

UG-1: All required parameters were reported for underground mine-water monitoring site UG-1.

UPDES: Outfall 001 did not report a discharge this quarter. The required water quality and flow data was reported for Outfall 002 was reported.

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

Surface Water Monitoring Sites-

LF-1 reported reduced concentrations for field conductivity and TDS. The previous quarter, LF-1 had reported slightly elevated concentrations for D-K and D-Na. The cation anion difference was out by 2.25 standard deviations from the mean. For the 2nd quarter in a row, RF-1 reported a slight decrease in field dissolved oxygen. RF-2 reported a slightly elevated TDS concentration (2.20 standard deviations from the mean). The previous quarter, RF-2 reported reduced concentrations for D-Ca and T-Hdns. The concentrations for these parameters returned to historic levels this quarter. The previous quarter, ST-6 reported reductions for several parameters (D-Mg, D-K, D-Na, SO4, T-Alk, bicarbonate and total anions and cations. The reported concentrations for these parameters this quarter returned to historic levels.

UPDES Sites- (UPDES Permit #UT0025640)

Site D001- UPDES outfall D001 (primary sediment pond at mine site) did not report a discharge this quarter.

Site D002- UPDES Outfall 002 water quality data was obtained each month this quarter. The average flow value for the quarter was 1,208.2 gpm (down from 1,387.75 gpm the previous quarter). All of the reported concentrations were within the established limits of the UPDES permit. The average total iron concentration for the quarter was 0.75 mg/L. Total dissolved solids concentrations averaged 1,155 mg/L (well below the UPDES limit of 2,000 mg/L).

Spring Monitoring Sites

Spring monitoring sites SP-102 and SP-12 reported parameters outside of two standard deviations from the mean the previous quarter. SP-12 did not report an observable flow this quarter. SP-102 reported a TDS concentration within established ranges.

Monitoring Well DH 86-2

Monitoring well DH 86-2 did not report any water quality parameters outside two standard deviations from the mean.

Underground pre-treatment mine water sample (UG-1)

A reduced sulfate concentration was reported in July (390 ppm versus 552.10 ppm average). Elevated concentrations were reported for total alkalinity, TDS and bicarbonate during the 3rd quarter of 2015. The elevated concentrations for these parameters has been reported for three consecutive quarters. This quarter, the total alkalinity, TDS and bicarbonate concentrations returned to established ranges. However; slightly reduced concentrations were reported for SO₄.

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

On page 7-36 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.”

Baseline sampling of ground and surface water sites will be required during the 3rd quarter of 2016.

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

Continue to monitor the data irregularities cited above for any trends.

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

YES NO

The Permittee must provide a water level depth for DH 86-2.

7. Follow-up from last quarter, if necessary.

YES

NO