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OK

WATER QUALITY MEMORANDUM

Utah Coal Regulatory Program

December 24, 2012

TO: Internal File

THRU: Daron Haddock, Permit Supervisor *DQH*

FROM: Steve Christensen, Environmental Scientist *SK*

RE: 2012 2nd Quarter Water Monitoring, West Ridge Resources, West Ridge Mine, Task ID #4132

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.

A Division Order was issued to the Permittee on April 3rd, 2012 (due July 2nd, 2012). The Division Order requires the Permittee to revise their currently approved Probable Hydrologic Consequences (PHC) section of the Mining and Reclamation Plan (MRP). The primary purpose of the revision will be to address the mine-water discharge. The MRP does not take into account a sustained and high volume mine-water discharge. The Permittee will need to address the origin of the encountered ground-water and determine (based on data) what the potential impacts of encountering that groundwater are. The PHC amendment was submitted and reviewed by the Division (Task ID # 4143). The amendment was found deficient and returned to the Permittee for additional revisions on September 7th, 2012. The Division is still awaiting the re-submittal of the revised PHC.

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.

Based upon permitting actions relative to mine expansions into the Right Fork of Whitmore Canyon, Road Spring and Section 5 Spring were added to the water monitoring program. The Permittee began collecting data on these springs in June of 2011. As a result, the 3rd quarter of 2011 is the first quarter of active monitoring for these springs.

Data was submitted for all of the required spring monitoring sites.

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. 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.

At the time of this report, flow data obtained from flume site RF-1 has not been received by the Division. The Permittee is currently trying to locate the data.

Data was not submitted for all the required stream/surface water monitoring points.

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

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	1.3
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.

Underground Flow Meters

Based upon permitting actions relative to mine expansions into the Right Fork of Whitmore Canyon, the Permittee committed to installing and monitoring flow meters in the locations of long-wall panels #20, #21 and #22. The locations of these flow meters are shown on Map 7-7 and in Appendix 7-16.

Two flow meters were installed (U-15E and U-17E). The two meters monitored the amount of ground water encountered in long-wall panels #20 and #21 (U-15E and U-17E respectively). The Permittee committed to revising the PHC and conducting a ground-water investigation in the event that the amount of flow encountered exceeded 250 gallons per minute (approximately 0.5 cubic feet per second) for a period of more than one month.

As of October of 2012, the maximum flow measured underground from either meter was obtained from flow meter U-15E (0.453 cfs). At no time since underground flow monitoring was initiated has the 0.5 cfs threshold been surpassed. Monitoring will continue until such time as that portion of the mine is sealed per MSHA safety considerations.

Due to poor conditions encountered underground, Panel #22 was not and will not be mined.

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

Spring Monitoring Sites: *All of the required data was submitted for the spring monitoring sites.*

Surface Water Monitoring Sites: *Water quality data has been placed in the data-base for flume site RF-1 for 2nd quarter 2012; however, it has not been approved by the Permittee for uploading. Additionally, the flume flow data has not been submitted by the Permittee for RF-1 2nd quarter 2012. The Permittee has been contacted and is attempting to locate the missing flow data. If the data cannot be located, a notice of violation will be issued. The issue was identified during the previous water quality evaluation.*

Well Monitoring Site: *All required well 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 data was reported for Outfall 002.*

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

Surface Water Monitoring Sites-

ST-3- *An increase in TDS and its associated components were reported during the 3rd quarter of 2010. No observable flow was reported the 4th quarter of 2010. ST-3 could not be accessed during the 1st quarter of 2011. TDS returned to within historical trend levels for the 2nd and 3rd quarters of 2011. Elevated TDS concentrations were reported the 4th quarter of 2011. The site could not be accessed during the 1st quarter of 2012. TDS concentrations reported for the 2nd quarter of 2012 was within established historic trends. However; an elevated reading was obtained for field conductivity. The average of 557.38 ppm was exceeded by 2.36 standard deviations with a reported value of 750 ppm.*

ST-6- *Elevated flow values have been reported at ST-6. As the primary flow component at this monitoring site is mine water discharge, it would appear that the high flow value is a result of increased mine-water discharge. Numerous parameters reported lower than usual concentrations (conductivity, flow, D-Ca, D-Mg, D-K, D-Na, CL, SO4, T-Alk., T-Hdms., TDS, Bicarbonate, total cations, total anions). Coupled with these lower readings was a significant increase in flow values. The average flow for ST-6 is 265 gpm. A flow value of 2,350 gpm was reported this quarter. It's unclear if the significant flow increase produced the reduced concentrations of the aforementioned parameters. Further evaluation will be conducted.*

ST-8- *Elevated concentrations for conductivity, D-Na, chloride and lab specific conductance were reported this quarter. Most notably, the reported concentration for chloride was outside of the mean by 8.30 standard deviations. The average chloride value for the site is 3.48 ppm. The reported concentration was 33 ppm. Additional monitoring will be conducted to assess what could be producing such a pronounced increase.*

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 June water quality sample reported an increase in TSS and a decrease in TDS. Flow values continue to rise. The average flow value for the quarter was 2,233 gallons per minute. The average flow for this monitoring site is 665 gallons per minute. Site D002 is the mine-water discharge. As discussed above, the underground flow monitoring in long-wall Panels #20 and #21 did not produce a reported flow above 0.5 cfs (approximately 250 gpm). Therefore, the Permittee was not required to perform additional hydrogeologic work.*

The June 25th, 2012 sample reported a total iron concentration of 1.41 ppm. The concentration is non-compliant with the UPDES permit limit of 1.3 ppm.

Spring Monitoring Sites

S-80- *Increased concentrations were reported for numerous parameters at this site (D-Mg, D-Na, Cl, SO4, TDS and T-Cations). At this time, it's unclear as to what caused the increase in these parameters. Further monitoring will be conducted.*

SP-101- *A reduction in field pH was reported with the average being 8.25 and the reported value being 7.5*

SP-102- *A significant increase in flow was reported for this monitoring site. The average*

flow value is 3.1 gpm. The reported flow value was 6.5 gpm.

SP-8- A decrease in numerous parameters was reported for this site. Decreases in D-Mg, D-K, D-Na, Cl, SO₄, T-Alkalinity, Total hardness, TDS, bicarbonate, total cations and total anions were reported outside of two standard deviations from the mean. What caused such a pronounced change in these parameters is unclear at this time. Additional monitoring will be conducted.

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 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.

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

YES NO

The Permittee must address the missing water quality data. Specifically, the flow values obtained from RF-1 for the 2nd quarter of 2012 must be submitted to the Division as soon as possible. Additionally, the water quality data for stream monitoring site ST-6 is still missing for 1st quarter 2012.

The Permittee has been advised that the data must be submitted to the Division as soon as possible in order to avoid enforcement action.

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

YES NO

See item 6 above.