

WATER QUALITY MEMORANDUM

Utah Coal Regulatory Program

March 27th, 2014

TO: Internal File

THRU: Daron Haddock, Permit Supervisor

FROM: Steve Christensen Environmental Scientist 

RE: 3rd Quarter 2013 Water Monitoring, Consolidation Coal Company, LLC, Emery Deep Mine, C/015/0015, WQ13-3, Task ID #4421

The Emery Deep Mine is currently an in-active coalmine. The coal mining operation previously utilized room and pillar mining techniques with the use of a continuous miner machine. The mine went into temporary cessation in late 2010. The coal reserves were fully extracted (thus falling into the planned subsidence category).

The approved Mining and Reclamation Plan (MRP) outlines the water monitoring requirements beginning on page VI-28. Table VI-17, Emery Mine Hydrologic Monitoring Program contains a comprehensive list of all groundwater (springs/seeps), surface water, groundwater monitoring wells and Utah Pollutant Discharge Elimination System (UPDES) outfalls. Plate VI-4, Ground Water Monitoring Well and Surface Water Monitoring Site Location Map depicts the locations of the various ground and surface water monitoring sites (including the UPDES discharge/outfall points).

As part of the approved water monitoring requirements cited above, the Permittee is required to submit a groundwater evaluation of the two Emery Town wells (Emery Town Well #1 and Emery Town Well #2). The Emery town well information is submitted with the Emery Deep Mine's annual report. The report was received by the Division on October 7th, 2013.

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

Springs

The MRP outlines the sampling of 5 springs within the permit and adjacent area. Flow and field parameters are sampled quarterly with water quality samples collected in the 2nd and 3rd quarters.

The Permittee reported a measurable flow for only spring monitoring site SP-10.

Spring monitoring sites, SP-11, SP-13, SP-14 and SP-15 did not produce a measurable flow this quarter.

Streams

The MRP outlines the sampling of 8 surface water monitoring stations within the permit and adjacent area.

Seven of the 8 surface water monitoring sites reported a measurable flow and accompanying data. Surface water monitoring site SWMS-8 did not produce a measurable flow this quarter.

Wells

The MRP outlines the sampling of 15 ground water monitoring wells within the permit and adjacent area (See Table VI-17). Table VI-17 identifies 13 wells, however; “Emery Town” was completed as two wells (#1 and #2) and “T1” is comprised of monitoring wells T1-B and T1-U. Of the 15 wells, 5 are monitored quarterly for water level only. The remaining 10 wells are sampled for water quality on a quarterly basis with the exception of wells RDA-2, RDA-4, and RDA-6 (sampled annually in the second quarter for both field parameters and water quality).

Data was submitted for all of the water monitoring wells.

UPDES

The Emery Deep Mine’s Utah Pollutant Discharge Elimination system (UPDES) Permit, #UT0022616, identifies 8 outfalls (001, 002, 003, 004, 005, 006, 007, and 009). UPDES Outfall 008 is no longer an active water monitoring site. The discharges from each of the outfalls ultimately report to Quitchupah Creek, a tributary of Muddy Creek. The receiving waters are designated according to Utah Administrative Code (UAC) R317-2-13.1 as 2B, 3C and 4. Historically, only Outfalls 001 and 003 have ever recorded a discharge. UPDES Outfall 008 is no longer active.

The Water Quality Board for the Division of Water Quality (DWQ) approved a rule change that allows for a site specific, in-stream standard for the Emery Deep’s effluent limitations based on its sulfate (SO₄) concentrations (as opposed to previous total dissolved solids-TDS standard). The new standards are identified in the currently approved UPDES permit (effective July 1st, 2012). The modified standard established an allowable TDS concentration of 4,766 ppm (maximum monthly average) and SO₄ concentration of 3,366 ppm (maximum monthly average). The currently approved UPDES permit will expire on June 30th, 2017.

UPDES Parameter	Established Limit
TSS	70 ppm (daily maximum)
T-Fe	1.4 ppm
Oil/Grease	10 ppm
pH	6.5-9.0
TDS	4,766 ppm (max. monthly avg)
SO4	3,366 ppm (max. monthly avg)

The Permittee submitted data for all required UPDES sites. Outfall 003 was the only monitoring point to report a discharge for this quarter.

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

Spring Monitoring Sites

All required data was submitted for the spring monitoring sites that produced a flow this quarter (as outlined in Table VI-17).

Surface Water Monitoring Sites

The Permittee submitted all required water quality data this quarter for the surface water monitoring sites that produced a measurable flow.

Water Monitoring Wells

The Permittee submitted the required data for all wells that are accessible. Obtaining a water level from the Kemmerer-L monitoring well is not possible. According to the Permittee, the monitoring well is sealed off. A PSI reading is obtained, but the Permittee does not know how water levels were obtained in the past. Fo

UPDES Monitoring Sites

A water level was not provided for Kemmerer-L monitoring well.

3. Were any irregularities found in the data?

YES NO

The following samples were reported outside of two standard deviations from the mean for springs and UPDES outfalls:

Sample ID	Date	Type of Site	Parameter	Value	Average	STD. Deviations
SP-10	9/16/2013	Spring	SO4	376 ppm	174.50 ppm	2.85
SP-10	9/16/2013	Spring	T-Hdns	585 ppm	440.33 ppm	2.50
SP-10	9/16/2013	Spring	TDS	967 ppm	587.8 ppm	3.33
SP-10	9/16/2013	Spring	D-Ca	124.49 ppm	89.33 ppm	3.08
SP-10	9/16/2013	Spring	D-K	4.28 ppm	1.95 ppm	2.89
SP-10	9/16/2013	Spring	D-Na	75.73 ppm	40.12 ppm	2.69
SP-10	9/16/2013	Spring	Bcrb	359 ppm	327.67 ppm	2.12
Outfall 003	8/27/2013	UPDES discharge point	TSS	22 ppm	9.02 ppm	2.01

The following irregularities were found with the surface water monitoring data and monitoring well data:

Sample ID	Date	Type of Site	Parameter	Value	Average	STD. Deviations
SWMS-1A	9/16/2013	Stream	Set Solids	19 ml/l	1.78 ml/l	3.74
SWMS-1A	9/16/2013	Stream	T-Fe	22.9 ppm	3.68 ppm	2.91
SWMS-1A	9/16/2013	Stream	T-Ca	247.18 ppm	107.47 ppm	5.66
SWMS-1A	9/16/2013	Stream	T-K	9.48 ppm	5.12 ppm	2.15
SWMS-1A	9/16/2013	Stream	TSS	2,596 ppm	269.11 ppm	6.62
SWMS-2	9/16/2013	Stream	Flow	4,802.16 gpm	1,118.4 gpm	2.77
SWMS-9	9/16/2013	Stream	T-Alk	117 ppm	272.15	2.25
SWMS-9	9/16/2013	Stream	Set Solids	30 ml/l	7.91 ml/l	2.59
SWMS-9	9/16/2013	Stream	T-Fe	48.94 ppm	5.42 ppm	2.15
SWMS-9	9/16/2013	Stream	TSS	5,692 ppm	338.09 ppm	4.57
SWMS-9	9/16/2013	Stream	D-Mg	36.49 ppm	203.18 ppm	2.09
SWMS-9	9/16/2013	Stream	D-Na	61.81 ppm	335.84 ppm	2.17
SWMS-9	9/16/2013	Stream	Bcrb	117 ppm	307.26 ppm	2.52

SWMS-3	9/16/2013	Stream	T-Fe	26.6 ppm	5.29 ppm	2.43
SWMS-3	9/16/2013	Stream	T-Ca	281.27 ppm	141.85 ppm	2.11
SWMS-3	9/16/2013	Stream	Temp	22.3 deg C	8.59 deg C	2.28
SWMS-3	9/16/2013	Stream	Bcrb	242 ppm	295.48 ppm	2.00
SWMS-4	9/16/2013	Stream	Set Solids	25 ml/l	2.70 ml/l	2.54
SWMS-4	9/16/2013	Stream	T-Fe	31.83 ppm	4.87 ppm	2.46
SWMS-4	9/16/2013	Stream	Temp	22.4 deg C	8.96 deg C	2.25
SWMS-5	9/16/2013	Stream	Temp	20.2 deg C	8.01 deg C	2.05
H-U	9/19/2013	Well	Depth to Water	107.6'	58.14'	4.11
Kemmerer-L	9/24/2013	Well	F-Cond	1,850 umhos/cm	972.68 umhos/cm	2.62
Kemmerer-L	9/24/2013	Well	Bcrb	124 ppm	142.59 ppm	2.23
Kemmerer-L	9/24/2013	Well	Carb	44 ppm	71.65 ppm	2.57

Water monitoring well H-U continues to show a drop in water level. The water level in monitoring well H-U has developed a downward trend since November 24th, 2010. It's unclear as to what is causing the drop in water level.

On October 11th, 2012, the Division received a citizen complaint from Mr. Jon Sundstrom. Mr. Sundstrom is a property owner in the area directly adjacent to the Emery Deep Mine permit boundary (T 22 S, R 06 E, SE ¼ of Section 15). Mr. Sundstrom is concerned that mining activity at the Emery Deep Mine may be impacting state appropriated water rights on his property. Mr. Sundstrom indicated that depressions have been forming on his property. On November 27th, 2012, the Division conducted a field inspection of the Sundstrom property. Six monitoring locations were established at depression areas in order to determine if slumping/settling was occurring at the property. At this time, it's uncertain as to whether mining activity is producing impacts on the Sundstrom property. The Division continues monitor water levels in well H-U (located in closest proximity to the Sundstrom property) and conduct additional field inspections in the spring of 2013.

Several monitoring wells have been reported as dry or having some type of obstruction in them: RDA-6, T1-U and USGS 4-1. If the integrity of the wells has been impacted and quality data is not obtainable from these locations, the Permittee must address how they will supplement their ground-water monitoring plan.

The Kemmerer-L well reported a depth to water of zero feet. However, water quality data was reported. It's unclear if the water in the well was at the riser or not.

UPDES Sites

Historically outfalls 002, 004, 005, 006, 007, 008 and 009 do not produce a discharge. These outfalls did not report a flow again for this quarter. Outfalls 001 and 003 are the primary outlets for discharging the ground water encountered within the mine works.

However, only Outfall 003 reported a flow this quarter. Outfall 001 did not report a flow this quarter. The TSS values reported for Outfall 003 were well within the established UPDES limits of 70 ppm. Additionally, all reported concentrations for TDS and T-Fe were

within the UPDES limits of 4,766 ppm and 1.4 ppm respectively.

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

There is no commitment in the MRP to resample for baseline parameters.

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

Follow up with Permittee on status of monitoring wells USGS 4-1, T1-U and RDA-6. Several monitoring wells have been reported as dry or having some type of obstruction in them: RDA-6, T1-U and USGS 4-1. If the integrity of the wells has been impacted and quality data is not obtainable from these locations, the Permittee must address if the wells can be repaired. If the wells cannot be repaired, the Permittee must address how their ground-water monitoring plan needs to be revised (i.e. eliminate the wells or replace them).

Additionally, the Permittee continues to report water quality data for the Kemmerer-L well, yet no water level. The Permittee must address this.

The Division will continue monitoring efforts at the Sundstrom property. Water depth levels in monitoring well H-U will also continue.

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

YES NO

The following additional information is required:

- 1) Water level for Kemmerer-L monitoring well.

H-U Depth to Water (ft)

