

# WATER QUALITY MEMORANDUM

## Utah Coal Regulatory Program

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December 31, 2014

TO: Internal File

THRU: Daron Haddock, Permit Supervisor

FROM: Steve Christensen Environmental Scientist 

RE: 2<sup>nd</sup> Quarter 2014, Water Monitoring, Consolidation Coal Company, LLC, Emery Deep Mine, C/015/0015, WQ14-2, Task ID #4615

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 7<sup>th</sup>, 2013.

On October 11<sup>th</sup>, 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 27<sup>th</sup>, 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. The six monitoring locations have been monitored since that time. The Division continues monitor water levels in well H-U (located in closest proximity to the Sundstrom property. See discussion below).

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 2<sup>nd</sup> and 3<sup>rd</sup> 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.

All but two (SWMS-8 and SWMS-9) of the eight surface water monitoring sites reported a measurable flow and accompanying data.

### **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 Quitcupah 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 (SO<sub>4</sub>) concentrations (as opposed to previous total dissolved

solids-TDS standard). The new standards are identified in the currently approved UPDES permit (effective July 1<sup>st</sup>, 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 30<sup>th</sup>, 2017.

<b>UPDES Parameter</b>	<b>Established Limit</b>
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 did not submit the required data for all wells. Issues with several wells must be addressed. (See discussion below Item #5)

#### **UPDES Monitoring Sites**

The Permittee submitted all required data for UPDES monitoring site 003. None of the other UPDES outfalls produced a flow during this quarter.

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

Spring SP-10 reported an elevated flow reading. The average for the site is 27.83 gallons per minute (gpm). The flow value this quarter was 736.03 gpm. It's not uncommon for high flow's to be measured at this spring during the 2<sup>nd</sup> quarter as it coincides with the onset of flood irrigation activities

The stream monitoring data provided fell within the established historical ranges of

the data set (i.e. within two standard deviations).

UPDES Outfall 003 was the only outfall to produce a flow this quarter. An elevated total suspended solids (TSS) concentration was reported for the June 16<sup>th</sup>, 2014 sampling event. A TSS concentration of 31 mg/L was provided (3.42 standard deviations from the mean of 9.07 mg/L). A slight elevated temperature reading was obtained on June 23<sup>rd</sup>, 2014. A temperature of 23.6 degrees Celsius was reported (2.05 standard deviations from the mean of 14.15 degrees Celsius).

The sulfate concentrations provided were well below the UPDES standard of 3,366 mg/L maximum monthly average. The average was 1,414.8 mg/L. The total dissolved solid concentrations were all well below the UPDES limit of 4,766 mg/L (average for the quarter was 2,826.8 mg/L). The total iron (T-Fe) concentrations were all below the UPDES limit of 1.4 mg/L (average for the quarter was 0.84 mg/L).

The depth to water data for water monitoring well H-U has produced significant variations. Water levels were fairly consistent from the early 1980's to approximately mid-2005 (50-60' depth to water). In the summer months of 2005, the water level rose to the 30-40' range before exhibiting a significant drop that continues to the present. The current depth to water at monitoring well H-U is 106' based on the most recent data provided by the Permittee (See chart below).

The Kemmerer-L monitoring well has reported an elevated bicarbonate concentration for two consecutive quarters now.

Monitoring well RDA-2 produced slightly reduced concentrations for total hardness, dissolved calcium and dissolved magnesium. Additionally, the depth to water dropped to 22.7' (mean depth to water is 17.56').

Monitoring well RDA-4 also produced a drop in water level elevation outside of two standard deviations. The reported depth to water was 22.7'. The average is 19.39'.

Emery Town well #1 reported elevated concentrations of chloride and field conductivity.

#### **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?**

Data collection issues have been identified at several groundwater monitoring wells:

- 1) Kemmerer-L Well: The Kemmerer-L well is a water quality well to be sampled quarterly. The water quality data has been consistently submitted to the Division;

however, water level data has not. The Permittee has indicated that the well is “sealed off” and a water level reading cannot be obtained. Upon review of the historical data, water levels were obtained from the Kemmerer-L well from 1973 to mid-2010.

- 2) The approved MRP requires in Table VI-17 that monitoring well USGS 4-1 be sampled quarterly for water level, field parameters and water quality. However; based on information provided by the Permittee, the well is dry and is no longer capable of producing water monitoring data.
- 3) Monitoring well RDA-6 is also identified in Table VI-17 of the MRP as a water quality data collection well (in addition to field parameters and water elevation). However; the last water quality data obtained from this well was in June of 2008. RDA-6 was completed to a depth of 40’ with a screen interval between 15’-35’ below grade. The water level had been reported as 19’ below grade for approximately the last 2 years; however, based on discussions with the Permittee, water quality data could not be obtained due to lack of water.
- 4) Monitoring T1-U is another water quality well identified in Table VI-17. T1-U is another well that is apparently dry. It does not appear that water quality data has ever been obtained from this well.

If, for whatever reason, the integrity of the wells has been impacted and quality and/or quantity data is not obtainable from these locations, the water monitoring plan must be revised. The Permittee must address how, given the limitations/issues associated with the aforementioned monitoring wells, that the approved monitoring plan is adequate to detect potential groundwater impacts as a result of coal mining activity. Additional water monitoring wells may be required.

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

YES  NO

See Discussion Item 5 above.

### H-U Depth to Water (ft)

