



**State of Utah**  
DEPARTMENT OF NATURAL RESOURCES  
MICHAEL R. STYLER  
*Executive Director*  
Division of Oil, Gas and Mining  
JOHN R. BAZA  
*Division Director*

## Technical Analysis and Findings

### Utah Coal Regulatory Program

August 17, 2016

**PID:** C0150015  
**TaskID:** 5243  
**Mine Name:** EMERY DEEP MINE  
**Title:** GROUNDWATER WELL EVALUATION & REHAB

### Summary

On July 18th, 2016, the Division of Oil, Gas and Mining (the Division) received a revision to the Emery Deep Mine Mining and Reclamation Plan (MRP). The Permittee proposes minor revisions to the approved water monitoring plan. The following is the technical analysis of the proposed revision.

*Deficiencies Details:*

schriste

### Operation Plan

#### Hydrologic Ground Water Monitoring

*Analysis:*

The amendment meets the State of Utah R645 requirements for Ground Water Monitoring.

Data collection issues had been documented for several quarters with several water monitoring wells. Monitoring wells Kemmerer-L, USGS 4-1, RDA-6, T1-U and SM1-3 had been noted as being unable to either produce water quality samples of sufficient volume as to submit for laboratory analysis and/or a water level reading for several quarters. Based on conversations with the Permittee and recently submitted water quantity and quality data, rehabilitation efforts have been effective for some of the monitoring wells. The Permittee was directed to provide a revised water monitoring plan that reflected the current status of the monitoring wells (i.e. rehabilitated vs.

The Kemmerer-L well is a water quality well to be sampled quarterly. It was completed in the Lower Ferron Sandstone with a pressure gauge. The Permittee indicated that the pressure gauge began reporting spurious data in approximately 2009. In recent quarters, water level data was not provided to the Division. As a result, the depth to water data reported in the database for 2009-2011 are not considered valid. Between 1995-2002, the pressure data (measured in psi) were inaccurately reported as depth to water and were commonly reported as 0'. As a result, the water-level data contained in the DOGM database needs to be converted by DOGM from a positive pressure value to a negative depth value from 1995 to the present.

USGS4-1 was a quarterly water level, field parameters and water quality monitoring well. According to the Permittee, the well is simply dry (i.e. the water level has fallen below the depth of casing). The well has been intermittently reported as "dry

well” since February 2009. The Permittee conducted a field evaluation in 2015 and indicated that the well (completed in the Blue Gate Shale) is functioning properly, but has been dry since 2007. Unfortunately, the Permittee reported the depth of the well as the depth to water. The database should be revised to show zero water in the well from 2007 to the present.

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. This well monitors the alluvial aquifer adjacent to Quitcupah Creek. In 2012, an “obstruction” was encountered in this well. The Permittee cleaned the well in April 2015 by injecting high pressure water until the water discharging from the well was clear. It appeared that the obstruction was a dead animal. The database should be modified to show that for the period of 2008-2014, the well was obstructed and remove the water level data for this period.

Monitoring well 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. A water level was provided for 3rd and 4th quarter 2014; however, no water quality data was obtained. The Permittee indicates that the depth of the well is likely between 380 to 420 feet deep (based on the well logs of nearby wells T2 and TP). Repeated attempts to extend a probe to the bottom of the well have demonstrated that the well is either obstructed or the casing is broken at a depth of approximately 43'. The area beneath the well was mined in the mid- to late- 1980s. It's possible that the well casing broke due to subsidence. The Permittee indicated that the monitoring well could not be rehabilitated. As such, the Permittee proposes the monitoring of TP-U. TP-U was cleaned in October 2015 by injecting water under high pressure and bailing the excess water from the well. Depth to water was reported as 394'. The Division approves of replacing the monitoring well T1-U with TP-U for purposes of monitoring within the Upper Ferron Sandstone in this area.

Monitoring well SM1-3 is identified in Table VI-17 as a water quality data collection well. Water quality data from SM1-3 has been reported to the Division since the mid 1980's. However; water quality data was not provided for 3rd quarter 2014. Based upon discussions with Emery Deep personnel, it would appear that the monitoring well was flooded during heavy precipitation events during the late summer of 2014. The well monitors the alluvial aquifer adjacent to Christiansen Wash. The well filled with sediment from runoff during a storm even in the fall of 2014. The Permittee was able to clean the well by injecting water at high pressure. Water quality data has been reported since 2nd quarter 2015.

The Permittee proposes the addition of Pump 3 Monitoring well (Pump 3 MW). The well will be utilized to obtain quarterly water level data.

On pages 2 and 3 of Appendix VI-19, Groundwater Well Integrity Evaluation & Rehabilitation Report, the Permittee provides Table 1, Summary of Monitoring Well Evaluation and Rehabilitation Efforts. In the 4th column of the table, the Permittee indicates that monitoring well USGS 1-2 should be added to the active monitoring network. However Table 1 also indicates that “attempts to clean the well in 2015 were unsuccessful.” Monitoring well USGS -1-2 was approved for removal from the water monitoring plan during the 2nd quarter of 2012. It is the Division's understanding that the Permittee will continue rehabilitation efforts for monitoring well USGS 1-2. At such time as the monitoring well is again functional, it will be added to the active water monitoring plan.

**schriste**