WATER QUALITY
M E M O R A N D U M

Utah Coal Regulatory Program

September 25th, 2017

TO: Internal File

THRU: Daron Haddock, Permit Supervisor

FROM: Steve Christensen, Environmental Scientist

RE: 1st Quarter 2017 Water Monitoring, Canyon Fuel Company, Soldier Canyon Mine, C/007/0018, WQ17-1, Task ID #5480

The approved water-monitoring plan can be found in Section 7.31.2 and summarized in Tables 7.31-1 through 7.31-4 of the Mining and Reclamation Plan (MRP). The narrative and tables identify the monitoring that is currently required as well as the monitoring requirements that will be required if the mining activity resumes at the site.

The Soldier Canyon Mine has been in temporary cessation since 1998. Due to the lack of coal mining activity at the site and the amount of water quality data previously obtained during active operations at the site, several water-monitoring sites have been discontinued. (See Discussion Below).

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

Springs –

Table 7.31-1, *Recommended Monitoring Program Soldier Canyon Mine*, identifies six springs. Of the six springs, four of them (5, 10, 23 and 24) have been identified, as springs where monitoring activity will resume if and when the mine becomes active. The remaining two springs (4 and 8) have been discontinued from active monitoring for the Soldier Canyon Mine. However, the springs are still monitored as part of the Dugout Canyon water-monitoring plan.

During temporary cessation, the Permittee is not required to monitor any springs at the Soldier Canyon Mine. However, Table 7.31-2, Field and Laboratory Measurement Protocol in the MRP outlines additional baseline data collection for springs and stream monitoring sites during the first wet year and first dry year to enable the preparation of base-flow hydrographs. The additional data collection efforts also include the collection of operational laboratory measurements and ^{3}H measurements during both a wet and dry year.

Streams –

A total of seven surface water-monitoring sites are listed in Table 7.31-1, *Recommended*

Monitoring Program Soldier Canyon Mine. Of the seven, two are actively monitored (G-5 and G-6). Three of the stream sites (G-2, G-8 and G-9) have been discontinued. The approved MRP detailed how monitoring of these sites would end one year following the end of mining activity in the area. Monitoring of stream site G-10 will resume in the quarter the Soldier Canyon mine portals are reopened for active mining. Stream monitoring site G-7 will be sampled during the first wet year and first dry year in order to enable the preparation of base-flow hydrographs.

During temporary cessation, the Permittee is required to sample G-5, and G-6 flow, and the laboratory parameters outlined in Table 7.31-4 each quarter. Several analytical parameters are only sampled during the 3rd quarter (dissolved iron, total iron, dissolved manganese and total manganese).

Water monitoring sites G-5 and G-6 reported a flow this quarter.

Wells–

Groundwater monitoring wells MW-1M, MW-1C, MW-2M and MW-3M have been discontinued. Approximately 4.5 years of baseline data were collected from these wells in the area of the refuse pile. No significant impacts were noted during that time and due to the breadth of baseline data obtained from these wells, a thorough characterization of the groundwater system in this area has been documented.

The monitoring of wells 5-1, 6-1 has been discontinued. Monitoring well 10-2 is no longer monitored as part of the Soldier Canyon MRP, but is monitored as part of the adjacent Dugout Canyon MRP. Monitoring well 32-1 is currently not monitored, however monitoring of this site will resume if and when the mine becomes active.

During temporary cessation, the Permittee is not required to sample any wells at the Soldier Canyon Mine.

UPDES–

The Soldier Canyon Mine contains three active UPDES sites. They are: MW-1 (001) mine water discharge, MW-2 (003) mine water discharge and UT0023680-002 sediment pond discharge. The Permittee is required to monitor each UPDES site monthly.

N*one of the three UPDES sites recorded any flow during the quarter.*

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

Streams –

Both G-5 and G-6 produced a flow this quarter. All of the required parameters were reported.

UPDES–

NA

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

For the 3rd quarter of 2015 stream monitoring site G-5 reported reduced concentrations for field conductivity, dissolved calcium, dissolved magnesium, chloride, sulfate and total dissolved solids were reported. The aforementioned parameters returned to within their respective data ranges in the 4th quarter of 2015. However; a reduced concentration for bicarbonate was reported the 1st quarter of 2015. Additionally, G-5 reported a slightly elevated sulfate concentration (246 ppm, 2.42 standard deviations from the mean of 116.88 ppm) the 1st quarter of 2015. The sulfate concentration returned to within the historic data range 2nd quarter of 2016. All of the remaining water quality parameters were within their established data ranges the 2nd quarter of 2016. Third quarters data reported increased concentrations for D-Ca, D-Mg, Cl, SO4 and TDS. The 4th quarter of 2016 again reported elevated concentrations for D-Ca, D-Mg, Cl, SO4, TDS, bicarbonate (CaCO3) and total cations. Concentrations for all of the aforementioned parameters returned to within historic ranges for the 1st quarter of 2017.

Stream monitoring site G-6, reported elevated concentrations for several parameters during the 4th quarter of 2015: dissolved magnesium, dissolved potassium, chloride, sulfate and total dissolved solids. Continued monitoring of these parameters will continue. The first quarter of 2016 reported elevated concentrations for field conductivity, carbonate, chloride, sulfate and TDS. Based on the data, it doesn't appear that off-site impacts are occurring as a result of mining activity given that the downstream monitoring site G-5 did not report elevated concentrations. Carbonate was reported as slightly elevated the second quarter of 2016 with a reported value of 24.2 ppm (3.15 standard deviations from the mean of 10.67 ppm). The third quarter of 2016 reported elevated concentrations for D-Ca, D-K, Cl and SO4. As with stream monitoring site G-5, G-6 again reported elevated concentrations for D-Ca, Cl, SO4, TDS and total cations and total anions the 4th quarter of 2016. As with stream monitoring site G-5, the parameters reported in recent quarters outside of two standard deviations from the mean returned to historic ranges the 1st quarter of 2017.

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

The MRP does not contain a commitment for re-sampling of baseline water data.

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

NA