

# WATER QUALITY MEMORANDUM Utah Coal Regulatory Program

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March 27, 2019

TO: Internal File

FROM: Steve Christensen, Environmental Scientist



RE: 2018 3<sup>rd</sup> Quarter Water Monitoring, Canyon Fuel Company (CFC), LLC, Dugout Mine, C/007/0039-WQ18-3, Task ID #5789

The Dugout Canyon 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 7-40 of the approved Mining and Reclamation Plan (MRP), water monitoring protocols and sampling requirements are provided for surface water, ground water, monitoring wells and Utah Pollutant Discharge Elimination System (UPDES) outfalls. Tables 7-4 and Table 7-5 list the individual monitoring sites and their sampling protocols for ground water and surface water respectively.

**1. Was data submitted for all required sites?**

**Springs** YES [X] NO [ ]

The approved MRP outlines the operational and post-mining monitoring of ten springs (203, 259A, 260, 321, 324, SC-100, SC-116, SC-14, SC-65 and SP-200) and one groundwater discharge site (MD-1). The locations of these springs are depicted on Plate 7-1, Hydrologic Monitoring Stations. MD-1 provides monitoring data for groundwater discharge from the old Gilson coal seam workings.

Spring monitoring sites 203, 260, 321, 324, SC-116, and SP-20 produced a measurable flow. The remaining sites (259A, SC-100, SC-14 and SC-65) did not produce a measurable flow.

**Streams** YES [X] NO [ ]

The approved MRP outlines the monitoring of ten stream sites (DC-1, DC-2, DC-3, DC-4, DC-5, FAN, PC-1A, PC-2, PC-3 and RC-1). Sites DC-4 and DC-5 are sampled during the first wet or dry year as conditions permit. The locations of these streams are depicted on Plate 7-1, Hydrologic Monitoring Stations.

Stream monitoring sites Fan, PC-1A, PC-2 and PC-3 could not be accessed this quarter due to snow and ice conditions. Monitoring sites DC-1, DC-3, RC-1, SS-1 and SS-2 reported no observable flow.

Stream monitoring sites DC-1, PC-1A, PC-2 and PC-3 produced a measurable flow. Stream monitoring sites Fan, DC-2, DC-3, SS-1, SS-2 and RC-1 did not produce a measurable flow.

**Wells**            **YES [X] NO [ ]**

The approved MRP outlines the sampling of three monitoring wells (GW-10-2, GW-11-2 and GW-24-1). However, monitoring wells GW 11-2 and GW 24-1 can no longer be monitored. Table 7-4 and Section 731.200 of the MRP specify that the Permittee will obtain quarterly water level measurements from the wells.

Monitoring well GW-24-1 became blocked during the winter of 2000 and was last sampled in September of 1998. The well was removed from monitoring after the 4<sup>th</sup> quarter of 2004. Monitoring well G-11-2 was last monitored in October 2007. Since that time, the Permittee has reported that the well has appeared to have “caved in”. Monitoring well GW-10-2 is still functioning and actively monitored for water level.

Though not required by the approved MRP, three additional monitoring wells (DH-1, DH-2 and DH-3) are monitored at the waste rock disposal site. Water levels are monitored quarterly with additional water quality sampling obtained from DH-1 during low flow periods (i.e. 3<sup>rd</sup> or 4<sup>th</sup> quarter).

Water levels are obtained from DH-1, DH-2, DH-3. Monitoring well GW 10-2 is also monitored for water level.

Depths were recorded for wells DH-1, DH-2, DH-3 and GW 10-2.

**UPDES**            **YES [X] NO [ ]**

Operational monitoring is required monthly for seven active UPDES outfalls (Permit No. UT0025593):

- **001**-Mine water discharge to Dugout Ck.,
- **002**-Sedimentation pond discharge to Dugout Ck. (disturbed area runoff),
- **003**-Storage water discharge to Dugout Ck. (30,000-gallon water tank discharge),
- **004**-Sedimentation pond (waste rock site) discharge to Grassy Trail Ck. Tributary,
- **005**-Pace Canyon fan portal breakout, mine water discharge to Pace Ck.
- **006**-Sediment trap culvert discharge to Pace Creek (disturbed area runoff from Pace Canyon Fan facility).
- **007**- Sedimentation pond (waste rock site) discharge to an unknown tributary of Grassy Trail Creek.

Specific effluent limitations and self-monitoring requirements as outlined in the UPDES permit are presented below:

Effluent Characteristics	Effluent Limitations
TDS, tons/day	1.0
Total Suspended Solids (TSS), ppm	70
Total Iron, ppm	1.1
Oil & Grease, ppm	10
Total Dissolved Solids (TDS), ppm	2,400
pH	9

3,000 parts per million (ppm) is the water quality standard for total dissolved solids (as established by the Department of Water Quality) for both Pace Creek and Dugout Creek.

UPDES outfall 002 and 005 produced a discharge this quarter.

**2. Were all required parameters reported for each site?**

**Springs**      YES [X] NO [ ]

**Streams**      YES [X] NO [ ]

**Wells**        YES [X] NO [ ]

**UPDES**        YES [X] NO [ ]

**3. Were irregularities found in the data?**

**Springs**      YES [X] NO [ ]

SP 321 reported a slight reduction in field pH (6.48 reported versus 7.76 mean) in the 2<sup>nd</sup> quarter of 2018. All reported concentrations/values were within historic ranges for 3<sup>rd</sup> quarter 2018.

SP 324 reported an elevated temperature reading (mean of 7.12 degrees C, reported value 16.3 degrees C).

**Streams**      YES [X] NO [ ]

DC-1 reported elevated concentrations for field conductivity, D-Na, Cl and bicarbonate the 2<sup>nd</sup> quarter of 2018. The trend continued for 3<sup>rd</sup> quarter 2018 with elevated concentrations for D-Na, CL and bicarbonate reported.

PC-1A reported an elevated concentration for SO4 3<sup>rd</sup> quarter 2018.

FAN monitoring site reported a slightly elevated concentration for SO4 in 2<sup>nd</sup> quarter 2018. The Fan stream monitoring site did not produce a measurable flow 3<sup>rd</sup> quarter 2018.

PC-2 produced elevated carbonate and Cl 2<sup>nd</sup> quarter 2018. Carbonate and Cl concentrations were again slightly elevated 3<sup>rd</sup> quarter 2018.

PC-3 reported an elevated SO4 concentration this quarter 2<sup>nd</sup> quarter 2018. Elevated concentrations were reported 3<sup>rd</sup> quarter for D-Na, Cl, TDS and total cations.

**Wells**            **YES [ X ] NO [ ]**

Monitoring well DH-3 reported an reduced depth to water of 77.66' (average 89.51') 2<sup>nd</sup> quarter 2018. A depth to water of 79.1' was reported 3<sup>rd</sup> quarter 2018 (within 2 standard deviations from the mean of 89.51').

**UPDES**            **YES [ ] NO [X]**

Outfalls 002 and 005 produced discharges 3<sup>rd</sup> quarter 2018. Outfall 002 discharged on July 16<sup>th</sup>, July 26<sup>th</sup>, August 16<sup>th</sup> and August 24<sup>th</sup>. Outfall 005 discharged on July 10<sup>th</sup>, July 11<sup>th</sup>, August 14<sup>th</sup>, September 18<sup>th</sup> and September 19<sup>th</sup>. Although high flow volumes were reported, the water quality concentrations were all well within or below the UPDES permit limits for TSS, TDS, T-Fe and pH.

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

The resampling of baseline data will next be performed in July 2019. In addition, one water sample will be collected at each spring sampling point during low flow period every fifth year, during the year, preceding re-permitting. These samples will be obtained for the analysis of baseline parameters (See Table 7-4). The Permittee will be notified/reminded of the July 2019 baseline data collection requirement in June 2019.

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

The Permittee should submit an amendment to the Dugout Canyon Mine Mining and Reclamation Plan (MRP) to revise Table 7-4, Groundwater Monitoring Program. Monitoring wells GW-10-2 and GW-11-2 can no longer be monitored. The Permittee must provide some justification for why these monitoring wells should not be replaced.