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**WATER QUALITY**  
**MEMORANDUM**  
Utah Coal Regulatory Program

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August 26, 2010

TO: Internal File  
THRU: Daron Haddock, Permit Supervisor *DQH*  
FROM: James D. Smith, Environmental Scientist III *JDS 01 Sept 2010*  
RE: 2010 First Quarter Water Monitoring, Canyon Fuel Company, LLC,  
Skyline Mine, C/007/0005, Task ID #3482

The Skyline Mine is an operating longwall mine. Current operations are in the North Lease area of the mine. Many mined-out areas of the mine have been sealed-off. Water monitoring requirements can be found in Section 2, especially pages 2-36, 2-36a, 2-36b, 2-37, 2-38, and 2-39 of the MRP.

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

First Quarter monitoring requires information from 15 sites.

**In-mine**

The MRP requires First Quarter sampling at 6 sites categorized as "other" or "in-mine, roof drippers". All 6 are monitored at the surface: CS-12, CS-14, 3, MD-1, and SRD-1 are mine discharge stations; CS-13 is a French drain; and ELD-1 is the combined output of JC-1 and JC-3. The Permittee submitted all required information for these sites.

**Springs**

The MRP does not require First Quarter sampling for springs.

**Streams**

The MRP requires First Quarter sampling at 4 stream-sites: CS-6, VC-6, VC-9, and VC-10. The Permittee submitted all required information for the stream sites.

Flow at sites NL-1 through NL-42 is measured monthly for 12 months before, during, and 12 months after being undermined by the longwall. The values are reported in the Annual Hydrologic Report (Sec. 2.4.4) and submitted to the database. The Permittee commits to measuring the flow monthly in June through October; flow will be measured during other months if the sites are accessible. No NL- site was visited during the First Quarter 2010.

**Wells**

For the First Quarter, only monthly flow measurement is required at JC-1 and JC-3 (the combined flow from these two wells is reported as ELD-1, an “other” or “in-mine, roof dripper”). No other wells are monitored during the First Quarter. The Permittee submitted all required information for the well sites.

**UPDES**

The UPDES Permit and MRP require weekly monitoring of 3 outfalls: 001, Sedimentation Pond Discharge to Eccles Creek at the Portal; 002, Sedimentation Pond Discharge to Eccles Creek at the Loadout; and 003, the Sedimentation Discharge at the Waste Rock Disposal Site. DMR parameters (total Fe, TDS, pH, TSS, flow, oil and grease, and specific conductivity, and temperature) are reported to the database as operational parameters. Total Fe is analyzed twice per month rather than weekly. Parameters that are not included in the operational parameter lists in the MRP - such as sanitary wastes, visible foam, and floating solids - are not reported in the electronic submittal to the Division.

Well JC-3 is permitted as a UPDES point by PacifiCorp. For JC-3, Skyline reports only monthly flow during the 1<sup>st</sup> quarter, and monthly flow and quarterly field parameters, TDS, TSS, and T-P during the 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> quarters. (The UPDES permit for JC-3 requires PacifiCorp to report flow, oil & grease, TDS, NH3, N as nitrate + nitrite, plus total and dissolved As, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Ag, Zn, and P.) Since July 2004, JC-3 has discharged only once, in October 2007.

The Permittee submitted all required information for the UPDES sites for the First Quarter. Outfall 001 flowed throughout the quarter and Outfall 002 had reported flow for 2 weeks.

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

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

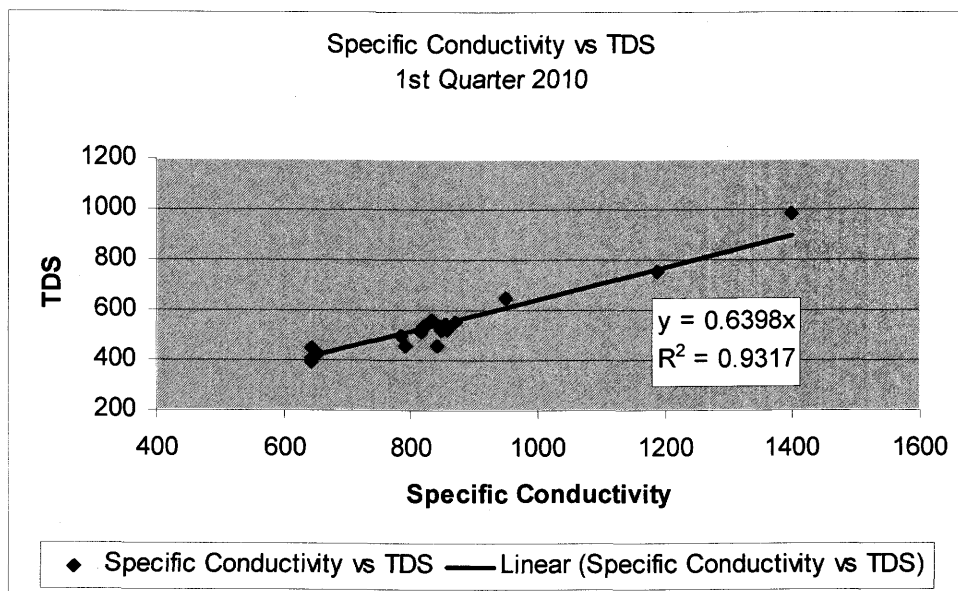
Listed parameters were more than two standard deviations from the mean. Parameters in bold typeface were also more than two standard deviations from the mean during the Fourth Quarter 2009. An asterisk indicates this is not a required parameter.

Site Name	Type	Parameters
CS-13	Other	water temperature
VC-6	Stream	<b>cation – anion balance</b>
CS-6	Stream	bicarbonate as CaCO3

With the exception of VC-6, cation-anion balance was within 5% for all samples that were analyzed for the appropriate ions. The cation-anion balance at VC-6 also exceeded 5% during the 1<sup>st</sup> quarter 2009.

The Division calculated the following Reliability Checks, based on previous Water Quality Reports for the Skyline Mine (for further information on Reliability Checks, see Chapter 4, *Water Quality Data: Analysis and Interpretation* by Arthur W. Hounslow.)

- TDS/Conductivity
  - Out of 21 samples for which both field specific conductivity and TDS were determined, 20 have a TDS/Conductivity ratio in the expected range between 0.55 and 0.76. The 21<sup>st</sup> sample, VC-6, is just outside that range, at 0.54.
    - The linear trendline has a slope of 0.64 (see chart).
    - UPDES discharges account for 15 of the 21 samples.



- All 6 samples for which both field specific conductivity and total cations were determined have a Conductivity/Cations ratio of 0.80 to 0.88; this ratio should be close to 1.00.
- For CS-6, CS-12, CS-13, CS-14, VC-6, and VC-9 the Division calculated Reliability Checks that involve dissolved Ca, Mg, K, Na, Cl, and SO<sub>4</sub>. There were not data on dissolved ions at other sites.
  - **Mg/(Ca + Mg) ratio**
    - Ideally the Mg/(Ca + Mg) ratio is < 40%.
    - Of the 6 samples, 5 have a ratio < 40%
    - The CS-12 ratio is right at 40%; CS-12 frequently has the highest ratio, right at or slightly above 40%.

- These results are consistent with results from recent quarters.
- **Ca/(Ca + SO<sub>4</sub>) ratio**
  - Ideally the Ca/(Ca + SO<sub>4</sub>) ratio is > 50%
  - All 6 samples have a Ca/(Ca + SO<sub>4</sub>) ratio < 50%
  - Because Mg/(Ca + Mg) values are within the expected range, SO<sub>4</sub> values may bear watching; however, these results are consistent with results from recent quarters (see summary comment below).
- **K/(K+ Na) ratio**
  - The K/(K+ Na) ratio should be < 20%.
  - At CS-14 it is 24%.
  - At the other 5 sites, the ratio ranges from 7 to 13%.
  - These values are consistent with recent results.
- **Na/(Na + Cl) ratio**
  - The Na/(Na + Cl) ratio should be > 50 %.
  - At CS-13 it is 36%
  - The ratio is 65% to 93% at the 5 other sites.
  - These are the very similar to the results from previous quarters

When these Reliability Checks do not meet the target value, it does not necessarily mean that the analyses are in error; however, it does indicate the collection and analysis procedures might benefit from some extra scrutiny by the Permittee. The Permittee should work with the lab to make sure that samples pass all quality checks so that the reliability of the samples does not come into question. However, the consistent results of these reliability checks from quarter to quarter might also indicate that local conditions do not match those upon which these Reliability Checks were formulated.

## **UPDES**

UPDES permit UT0023540 (effective December 1, 2009) allows for a DML for TDS of 1,200 mg/L and a 30-day average of 500 mg/L. There is no tons/day DML unless the 30-day average exceeds 500 mg/l; then a 7.1 tons/day limit is imposed. For the First Quarter of 2010, the discharge at Outfall 001 did not exceed the DML for TDS of 1,200 mg/L; however, the 30-day average was 509 mg/L (407 to 561 mg/L) and the tons/day load (calculated from the weekly values for TDS and flow in the database) during the First Quarter averaged over 10 tons/day, ranging from 6.8 to 14.3 tons/day. Outfall 002 discharged for 2 weeks: TDS measured 406 and 521 mg/L, but the load was only 0.02 tons/day. Because of ongoing exceedences, particularly at outfall 001, Canyon Fuel Company participates in the Salinity Offset Plan that was approved by DWQ on January 5, 2005 (retroactive to September 2004).

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

Beginning in 2010 and every five years thereafter, baseline analyses are to be done on samples collected during the 3<sup>rd</sup> Quarter (MRP p. 2-44).

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

No further actions are necessary at this time.

**6. Does the Mine Operator need to submit more information to fulfill this quarter's monitoring requirements?** YES  NO

**7. Follow-up from last quarter, if necessary.**

None.

**8. Did the Mine Operator submit all the missing and/or irregular data (datum)?**

There were no missing or irregular data.