

# WATER QUALITY MEMORANDUM

## Utah Coal Regulatory Program

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September 9, 2009

TO: Internal File

THRU: Daron Haddock, Permit Supervisor *DQH*

FROM: James D. Smith, Environmental Scientist III *JS 09/09/09*

RE: 2009 First Quarter Water Monitoring, Canyon Fuel Company, LLC, Skyline Mine, C/007/0005, Task ID #3226

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, 2-37a, and 2-39aa 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 of 6 "in-mine, roof drippers", although all six are actually 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 the in-mine 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 and reported in the Annual Hydrologic Report (Sec. 2.4.4) and is 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 2009.

## 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 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/MRP requires 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, TSD, 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 flow, oil & grease, TDS, NH<sub>3</sub>, 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. Outfalls 001 and 002 had reported flow.

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.

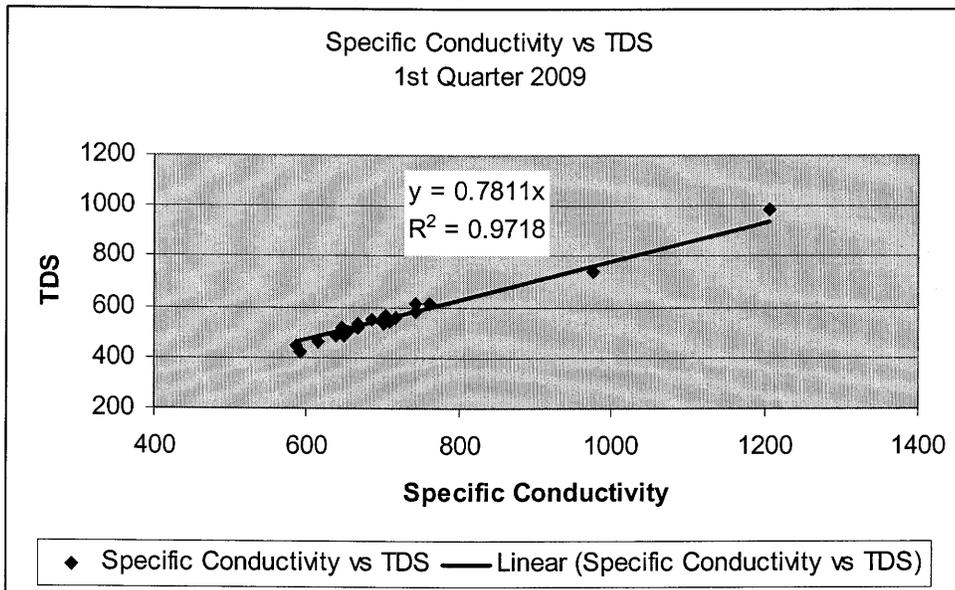
UT0023540-002, 2/26/2009 flow VC-6 cation – anion balance
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Cation/anion balance was within 5% for all samples that were analyzed for the appropriate ions.

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 22 samples for which both field specific conductivity and TDS were determined, only 4 have TDS/Conductivity ratios  $< 0.76$ , and 4 have a ratio  $> 0.8$ .
    - The linear trendline has a slope of 0.78 (see chart).
    - This ratio is typically between 0.55 and 0.76.
    - UPDES discharges account for 15 of these samples.



- All 6 samples for which both field specific conductivity and total cations were determined have a Conductivity/Cations ratio of 0.75 or less; this ratio should be close to 1.00.

These two Reliability Checks may be indicating that the meter used to measure field specific conductivity is reading low and that the Permittee needs to calibrate it more frequently, or possibly replace it.
- 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.
  - 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 consistently has a high ratio and frequently has the highest ratio.
  - All 6 have a  $Ca/(Ca + SO_4)$  ratio  $< 50\%$ .
    - Ideally the ratio is  $> 50\%$ .
    - Because  $Mg/(Ca + Mg)$  values are within the expected range, SO<sub>4</sub> values may bear watching.

- The K/(K+ Na) ratio should be < 20%.
  - At CS-14 it is 23%.
  - At the other 5 sites, the ratio ranges from 7 to 13%.
  - These are the very same results as 4<sup>th</sup> Quarter 2008
- The Na/(Na + Cl) ratio should be > 50%.
  - At CS-13 it is 37%
  - The ratio is 75% to 93% at the 5 other sites.
  - These are the very similar to the results from 4<sup>th</sup> Quarter 2008

When 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. An analysis and explanation of the inconsistencies by the Permittee would help to increase the Division's confidence in the procedures used for sample collection and analysis. 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.

#### UPDES

The UPDES permit in effect during the First Quarter (dated Nov. 23, 2004) allows for a DML for TDS of 1,310 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 2009, the discharge at UPDES Permit discharge point UT0023540-001 Permittee did not exceed the DML for TDS of 1,310 mg/L; however, the 30-day average remained averaged 539 mg/L (503 to 614 mg/L) and the tons/day load during the First Quarter averaged over 10 tons/day and ranging from 8.9 to 14.4 tons/day (calculated from the TDS and flow data in the database). Because of such ongoing exceedences, 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.

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