#3962
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WATER QUALITY MEMORANDUM

Utah Coal Regulatory Program

June 28, 2012

TO: Internal File

THRU: Steve Christensen, Permit Supervisor SC

FROM: Ken Hoffman, Hydrologist KH

RE: Fourth Quarter of 2011 Water Monitoring, PacifiCorp, Deer Creek Mine. C/015/0018, Task ID #3962

The Deer Creek Mine monitoring plan is described in Appendix A of Volume 9 of the MRP.

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

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

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

Listed parameters were more than two standard deviations from the mean.

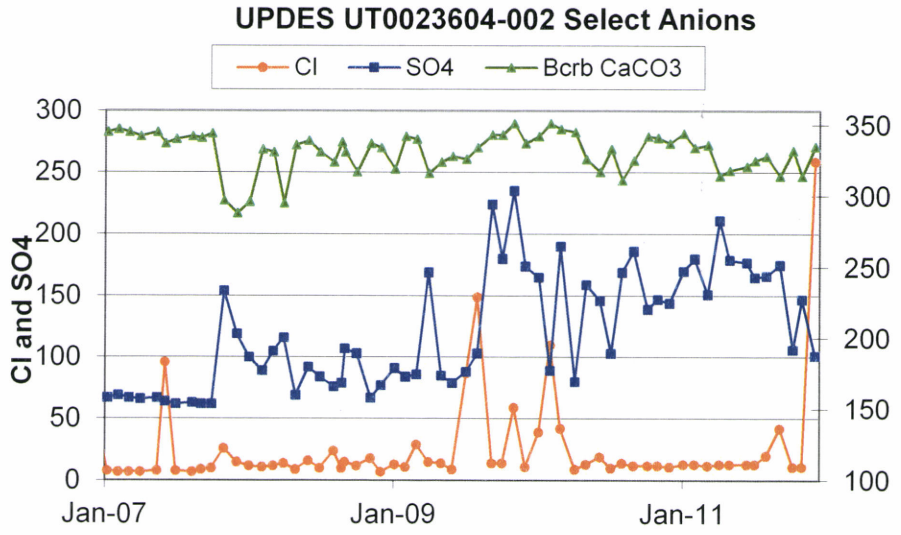
Streams YES ☒ NO ☐

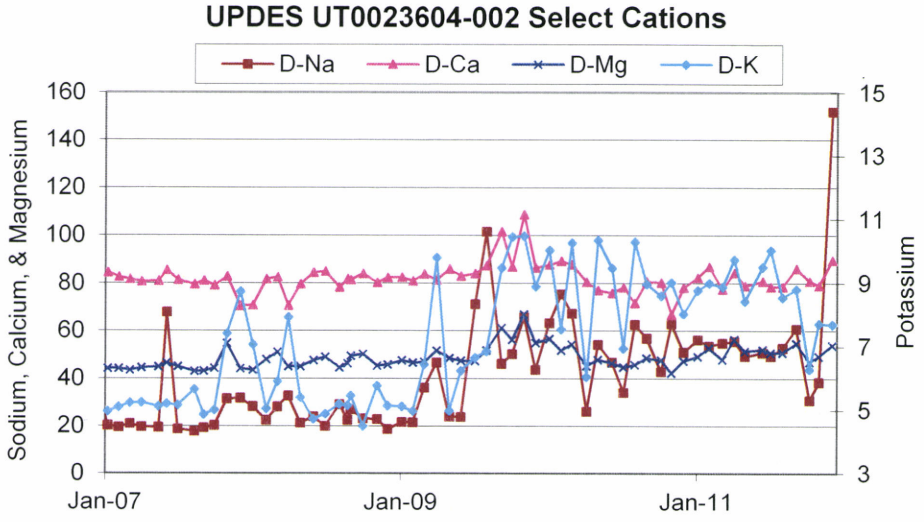
DCR04 Flow: October, November, December
DCR06 Flow: October, November, December
HCC01 December: field conductivity, dissolved calcium, dissolved magnesium, bicarbonate, total alkalinity, total hardness, total cations
HCC02 December: field conductivity, dissolved calcium, dissolved magnesium, bicarbonate, total alkalinity
HCC04 December: field conductivity, dissolved calcium, dissolved magnesium, bicarbonate, total alkalinity
ICA October: flow
ICB October: flow, dissolved sodium
RCF3 December: Water Temperature

UPDES YES ☒ NO ☐

Outfall No. 001 October: bicarbonate
Outfall No. 002 December: field conductivity, dissolved sodium

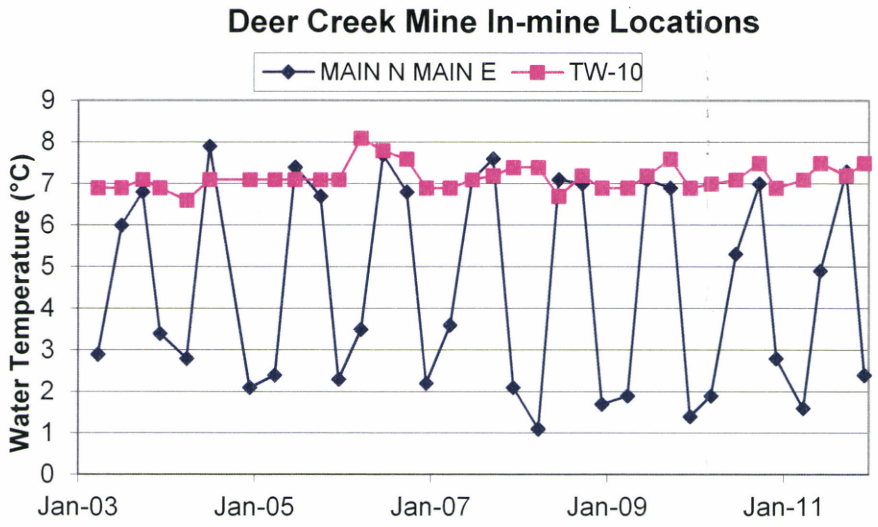
Fourth Quarter of 2011 chloride and dissolved sodium results at UT0023604-002 are strangely out of the ordinary. These results were confirmed by the operator and reported by the laboratory. First Quarter of 2012 results were examined early and levels of chloride and dissolved sodium have returned to normal range so the December 2011 result appears to be just an isolated abnormality.





In-mine YES ☐ NO ☒

The water temperature at Main North Main East varies seasonally year-after-year (see following chart), indicating that this in-mine source is most likely fed by infiltration of surface water rather than draining surrounding strata. The temperature at TW-10 shows some seasonal variation but it is not as definitive as at Main North Main East.



Springs YES ☒ NO ☐

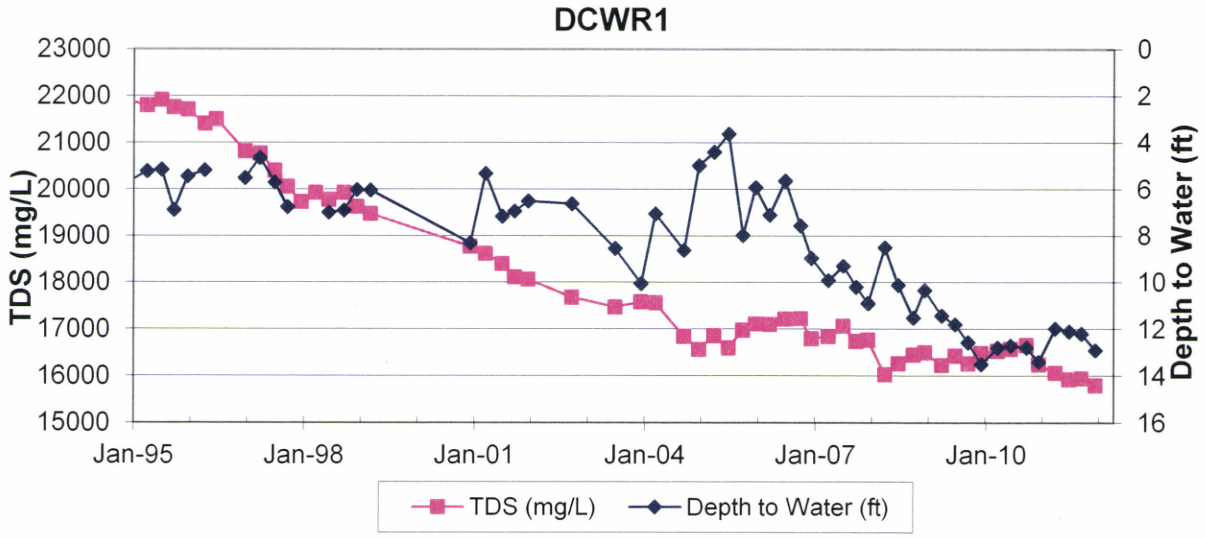
The following springs were more than two standard deviations from the mean:

79-15 October: field and laboratory conductivity, dissolved magnesium, dissolved sodium, bicarbonate, total alkalinity, total dissolved solids
79-2 October: field conductivity, bicarbonate
79-26 October: field conductivity
79-35 October: field conductivity, acidity
80-41 October: field conductivity
80-47 October: Acidity
80-50 October: dissolved calcium
82-52 October: field pH, field conductivity
84-56 October: field conductivity, dissolved sodium
89-60 October: field conductivity, bicarbonate
89-66 October: field conductivity, dissolved sodium
89-68 October: field conductivity, bicarbonate
91-72 October bicarbonate
Burnt Tree Spring October: field conductivity
Elk Spring October: field conductivity
JV-34 October: field pH
JV-9 October: Dissolved calcium, dissolved sodium, total alkalinity
Little Bear October: bicarbonate
MF 7 October: dissolved sodium
NEWUA-Meter 3 December: water temperature
RR23A October: laboratory pH
RR 5 October: water temperature
Sheba Springs October: dissolved calcium, bicarbonate, total alkalinity
UJV 101 October: total hardness

Wells YES ☒ NO ☐

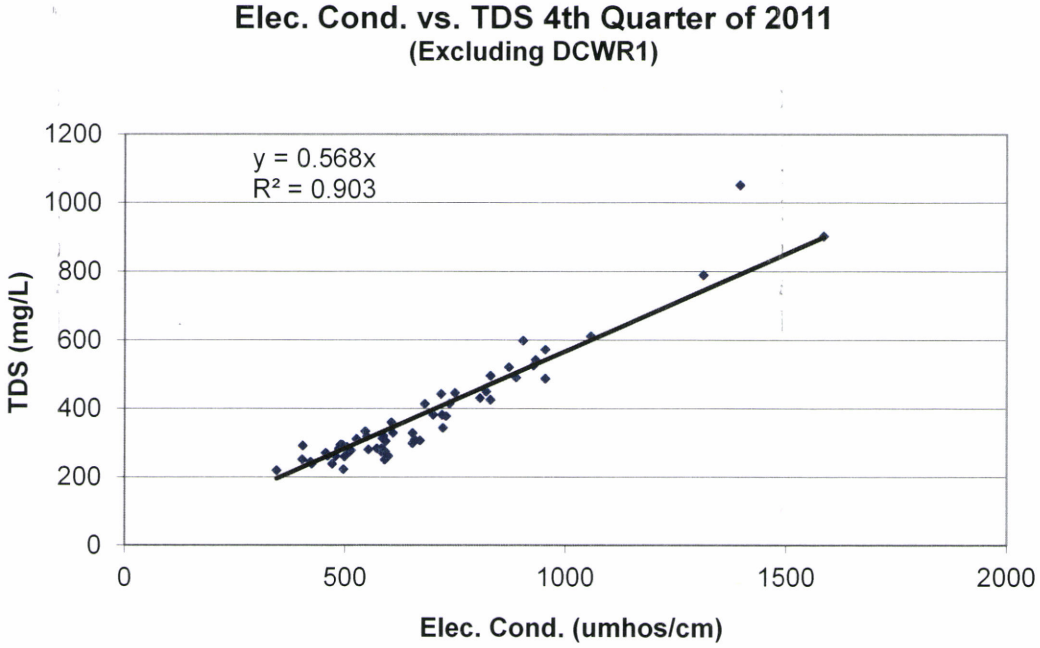
DCWR1 December: field pH, total alkalinity

Although it hasn't been flagged as varying from the mean by more than two standard deviations, water level at DCWR1 has been dropping since 2006 (following a small rise in 2004-2005). TDS was dropping at a similar rate, but now appears to have stabilized. These changes are probably from factors other than disposal of waste rock at this site: a similar drop in water level is seen at WCWR1 at the Cottonwood/Wilberg Mine Waste Rock Disposal Site.



TDS/field electric conductivity ratios – all sites

The TDS/field electric conductivity ratio typically falls between 0.55 and 0.76 for dissolved solids concentrations found in natural waters. As the following chart shows, data for these two parameters submitted for the Fourth Quarter of 2011 at the Deer Creek Mine generally results in a ratio that falls within this range: DCWR1 is not included in the trendline calculation.



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

Baseline analyses were performed in 2001 and 2006 and are to be repeated every 5 years. Baseline analyses are currently being conducted in 2011.

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

There is no indication of trends or extremes in any of the parameter values. No further action recommended 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)?

NA.