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WATER QUALITY MEMORANDUM

Utah Coal Regulatory Program

January 26, 2010

TO: Internal File

THRU: James D. Smith, Permit Supervisor

FROM: Steve Christensen, Environmental Scientist SC

RE: 2008 Fourth Quarter Water Monitoring, Canyon Fuel Company, Soldier Canyon Mine, C/007/0018-WQ-08-4, Task ID #3189

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.

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 spring G-10 will resume in the quarter the Soldier Canyon mine portals are reopened for active mining. Spring 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).

The Permittee monitored and reported the data as required for G-5 and G-6.

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. However, none of the three UPDES sites has produced any measurable flow in some time. MW-1 (001) last produced a discharge on December 13th, 1991. MW-2 (003) last flowed on March 16th, 1998. UT0023680-002 last flowed on October 1st, 1985.

None of the three UPDES sites recorded any flow during the quarter.

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

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

Several routine Reliability Checks were outside of the standard value for both G-5 and G-6 (See Bolded values below).

Site	Reliability Check	Value Should Be...	Value is...
G-5	Mg/(Ca + Mg)	< 40 %	**57%**
G-5	TDS/Conductivity	>0.55 & <0.75	0.63
G-5	Conductivity/Cations	>90 & < 110	**83.9**
G-5	Ca/(Ca+SO4)	>50%	**31%**
G-6	Mg/(Ca + Mg)	< 40 %	**42%**
G-6	TDS/Conductivity	>0.55 & <0.75	0.6
G-6	Conductivity/Cations	>90 & < 110	**84.6**
G-6	Ca/(Ca+SO4)	>50%	**35%**

The Permittee should work in consultation with the lab to insure that all samples pass routine quality checks. In the event that there are inconsistencies, the Permittee should consult with the lab (if need be) and/or provide some analysis or explanation as to why the inconsistent values were produced.

The Permittee is further investigating possible handling/collection issues that may have introduced contamination into the samples.

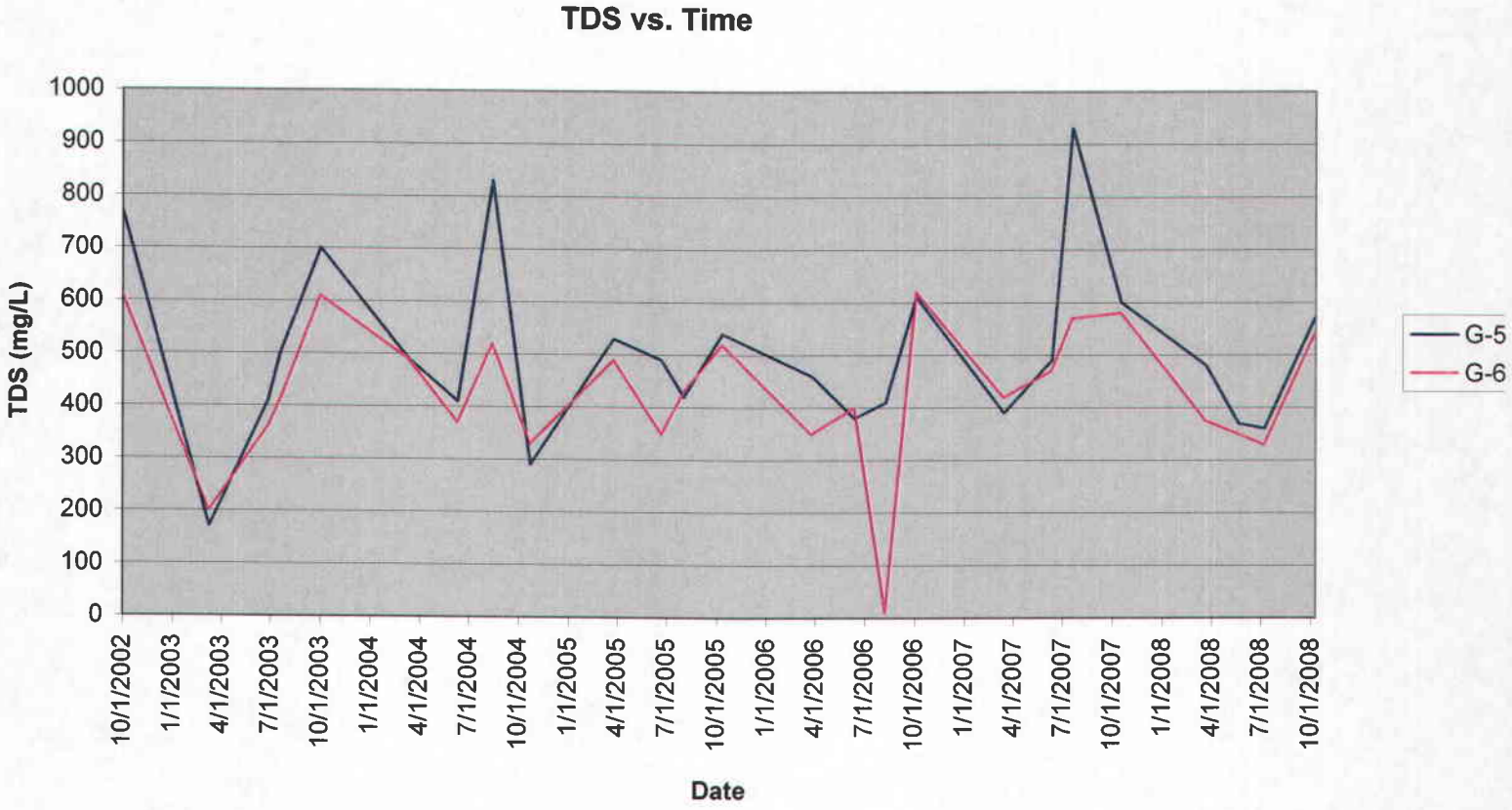
All of the submitted analytical results for sites G-5 and G-6 fell within 2 standard deviations of the data set and followed established seasonal trends.

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?

The Permittee should review their sample collection methods in order to try and identify areas where contamination may be introduced.


TDS vs. Time
TDS (mg/L)
1000
900
800
700
600
500
400
300
200
100
0
10/1/2002
1/1/2003
4/1/2003
7/1/2003
10/1/2003
1/1/2004
4/1/2004
7/1/2004
10/1/2004
1/1/2005
4/1/2005
7/1/2005
10/1/2005
1/1/2006
4/1/2006
7/1/2006
10/1/2006
1/1/2007
4/1/2007
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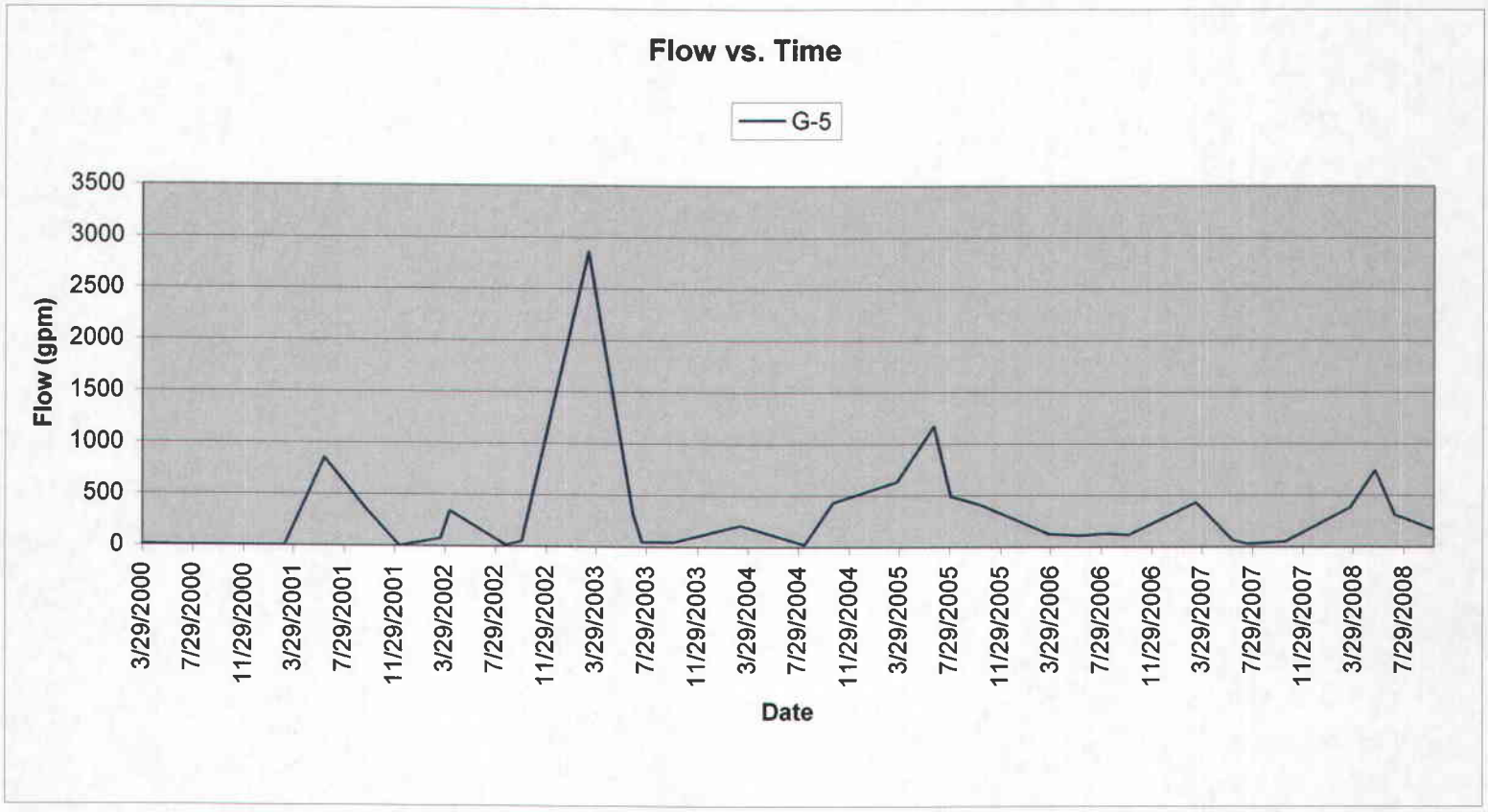
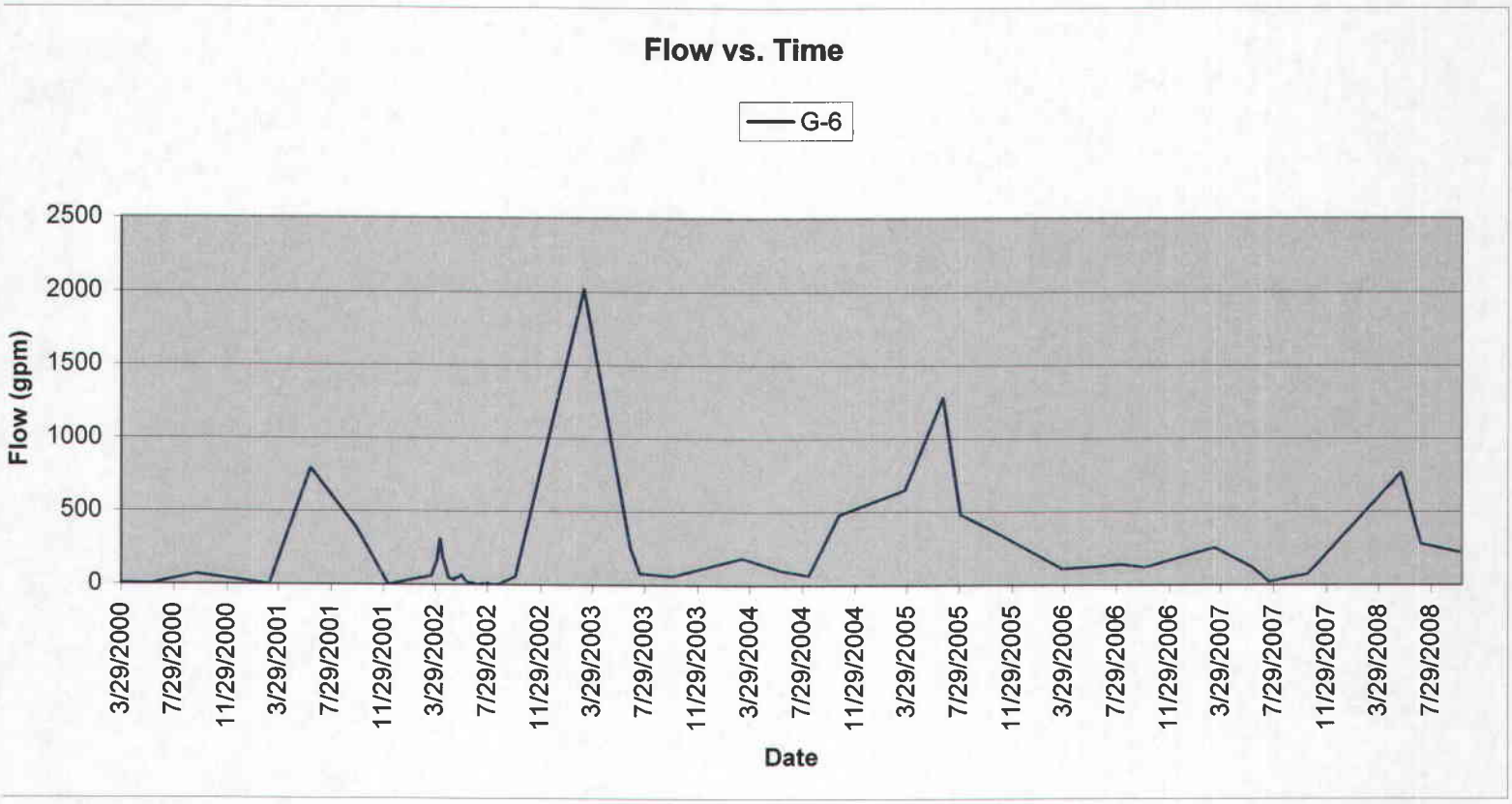
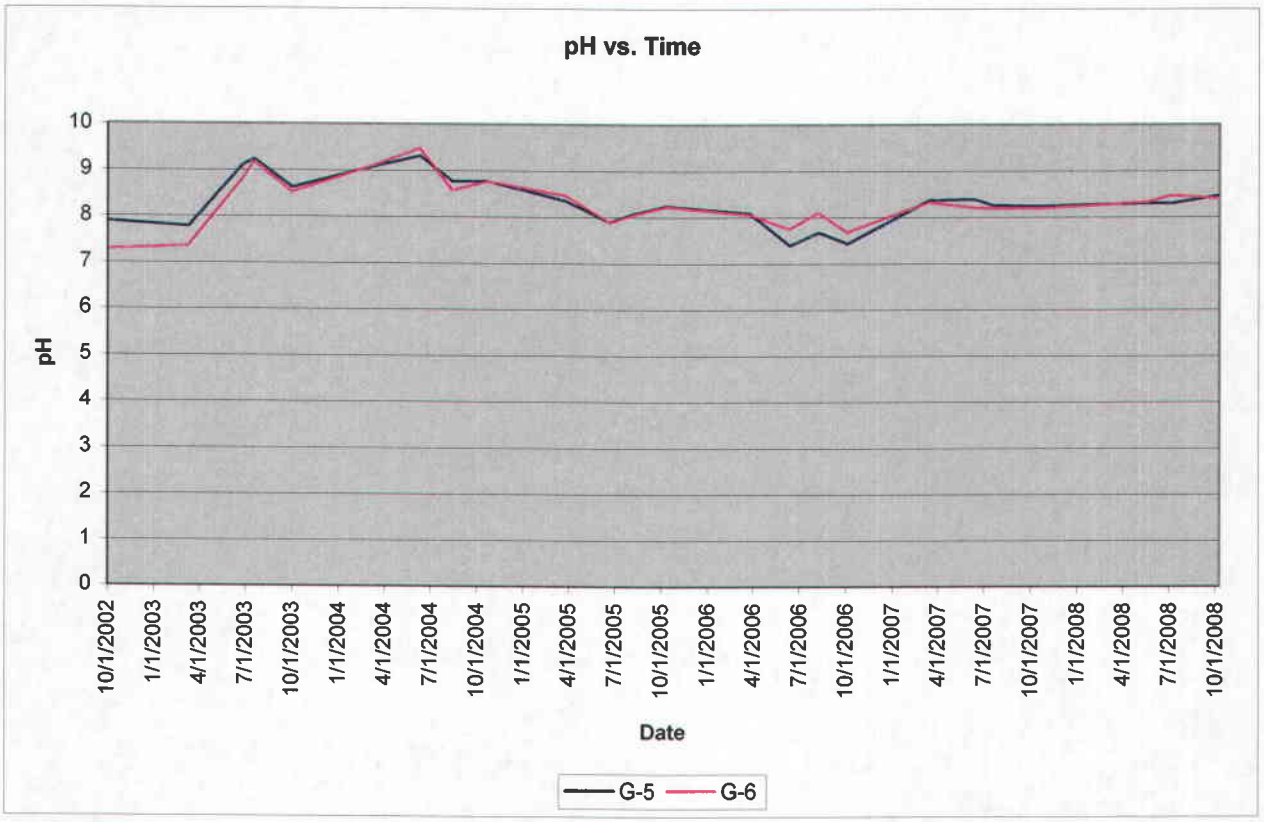
10/1/2007
1/1/2008
4/1/2008
7/1/2008
10/1/2008
Date
G-5
G-6


Flow vs. Time
G-5
Flow (gpm)
3500
3000
2500
2000
1500
1000
500
0
3/29/2000
7/29/2000
11/29/2000
3/29/2001
7/29/2001
11/29/2001
3/29/2002
7/29/2002
11/29/2002
3/29/2003
7/29/2003
11/29/2003
3/29/2004
7/29/2004
11/29/2004
3/29/2005
7/29/2005
11/29/2005
3/29/2006
7/29/2006
11/29/2006
3/29/2007
7/29/2007
11/29/2007
3/29/2008
7/29/2008
Date


Flow vs. Time
G-6
Flow (gpm)
2500
2000
1500
1000
500
0
3/29/2000
7/29/2000
11/29/2000
3/29/2001
7/29/2001
11/29/2001
3/29/2002
7/29/2002
11/29/2002
3/29/2003
7/29/2003
11/29/2003
3/29/2004
7/29/2004
11/29/2004
3/29/2005
7/29/2005
11/29/2005
3/29/2006
7/29/2006
11/29/2006
3/29/2007
7/29/2007
11/29/2007
3/29/2008
7/29/2008
Date


pH vs. Time
pH
10
9
8
7
6
5
4
3
2
1
0
10/1/2002
1/1/2003
4/1/2003
7/1/2003
10/1/2003
1/1/2004
4/1/2004
7/1/2004
10/1/2004
1/1/2005
4/1/2005
7/1/2005
10/1/2005
1/1/2006
4/1/2006
7/1/2006
10/1/2006
1/1/2007
4/1/2007
7/1/2007
10/1/2007
1/1/2008
4/1/2008
7/1/2008
10/1/2008
Date
G-5
G-6