

# WATER QUALITY MEMORANDUM

## Utah Coal Regulatory Program

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November 19, 2014

TO: Internal File

THRU: Steve Christensen, Permit Supervisor 

FROM: Keenan Storrar, Hydrologist *Keenan Storrar*

RE: Second Quarter of 2014 Water Monitoring, Alton Coal Development LLC, Coal Hollow, C/025/0005, Task ID #4610

The Coal Hollow mine is an active surface mine. The permit application was approved on October 15, 2009 and a Permit was issued to Alton Coal Development, LLC (ACD) on November 8, 2010. Mining activity commenced in November 2010.

The water monitoring program for the Coal Hollow mine is described in Section 731.200 of the MRP. Water monitoring locations are listed in Table 7-5 and shown on Drawing 7-10. Monitoring protocols are described in Table 7-4 and the specific protocol(s) assigned for each location are listed in Table 7-5. Operational/Reclamation and Baseline monitoring parameters are listed for surface water on Table 7-6A and Table 7-6B, respectively, and for groundwater on Table 7-7A and 7-7B, respectively. Special Condition No. 4 of the mine Permit requires the Permittee to monitor for selenium where water leaves the mine site, during operational and reclamation phases.

The 85.88 acre Dame Lease IBC will be highwall mined in the near future. The highwall mined boreholes will undermine or nearly undermine wells, springs, and seeps in the NE ¼ sec. 29, T39S., R5W, mostly east of the sink valley fault, potentially affecting these water resources. In anticipation of potential well drawdown or springs drying-up, the Division required a weekly water monitoring plan to begin one month prior to highwall mining and ending one month after highwall mining has ceased in the identified area. The Permittee began monitoring the sites weekly in June, 2014.

This report was prepared from monitoring data queried from the UDOGM database. The data that support this report were collected and submitted to the database by Alton Coal Development (ACD).

### 1. Were data submitted for all required sites?

**Springs**      YES [X] NO [ ]

Eleven springs are monitored quarterly (Table 7-5). All of the spring locations except one (SP-3) are located in Sink Valley Wash (Drawing 7-10). Five springs are monitored for field parameters only: Sorensen Spring, SP-3, SP-16, SP-22 and SP-23. Six springs are monitored for field parameters and operational analyses: SP-4, SP-6, SP-8, SP-14, SP-20, and SP-33. Sorensen spring, SP-8, SP-14, SP-20, and SP-22 have weekly measurements beginning one month prior to highwall mining and continuing until one month after highwall mining in the area, followed by monthly measurements for a period of six months. SP-3 is a control spring discharge measurement for the area.

All 11 springs were sampled during Q2 2014 the measured flow at each spring is as follows:

SAMPLE	SITE	Flow (gpm)
SORENSEN SPRING	Alluvial spring Sink Valley	0.143
SP-14	Alluvium - Sink Valley	< 1.
SP-16	(Teal Spring) - Alluvium -Sink Valley	0.514
SP-19	(Sorenson Pond)- Alluvium - Sink Valley	0.066
SP-20	Alluvium - Sink Valley	8.06
SP-22	Alluvium - Sink Valley	< .5
SP-23	Alluvium - Sink Valley	0.288
SP-3	Pediment Alluvium - Lower Sink Valley Wash	No Access
SP-33	(Johnson Spring) - Alluvium - Sink Valley	7.85
SP-4	Alluvium/Fault? - Lower Sink Valley Wash	0.633
SP-6	Alluvium - seep in Sink Valley	< 5.
SP-8	Alluvial spring at Dames Ranch	16.2

Notes: Data were collected in mid-June, 2014

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

Ten stream sites are monitored quarterly. Operational analyses are performed for BLM-1, SW-2 (Kanab Creek below Robinson Creek); SW-3 (Kanab Creek above permit area); SW-4 and SW-5 Lower Robinson Creek [LRC] above permit area and above Kanab Creek, respectively); SW-6 (Sink Valley wash at permit boundary); SW-8 (Swapp Hollow Creek above permit area); and SW-9 (Sink Valley Wash below permit area). Field parameters only are measured at RID-1 (irrigation ditch in Robinson Creek) and SW-101 (LRC in permit area). BLM-1, SW-5, SW-6, and SW-9 are monitored quarterly for total and dissolved selenium.

All required stream sites were monitored for the Q1 2014. No flow was present for stream monitoring sites RID-1, SW-101, SW-4, SW-5, SW-6, and SW-9. Flows reported for Lower Robinson Creek averaged 0.12 gpm. Flows in Kanab Creek averaged 21.6 gpm, Swapp Hollow was 2.1 gpm, and Sink Valley Wash was dry.

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

Table 7-5 identifies 26 wells which will be monitored quarterly when accessible. Wells will be monitored for water elevation only except for six wells, which will be monitored for water elevation and operational parameters: Y-61 (artesian Sink Valley alluvium above mining), LR-45 (LRC alluvium below mining), LS-28, LS-85 (artesian Sink Valley alluvium below mining), SS-30 (Sink Valley alluvium below mining) and UR-70 (LRC alluvium above mining). Several wells are expected to be destroyed or rendered inoperable due to mining activities (MRP page 7-59). These wells are to be monitored quarterly until they are destroyed or rendered inoperable. Wells C0-18 and C0-54 were

destroyed Fourth Quarter of 2011. C9-15, C9-25, C9-40 were destroyed in Q3 of 2013 and Y-38 was destroyed in Q4 of 2013.

All groundwater wells were monitored during Q2 2014.

**UPDES**      **YES [X] NO [ ]**

Discharges from the Coal Hollow mine are authorized under UPDES General Permit for Coal Mining application number UTG040027. The UPDES permit expires on July 31, 2018 and authorizes discharges from six outfalls: 001, 001B, 002, 003, 004, and 005. These outfalls correspond to sediment ponds 1, 1B, 2, 3 and 4 and discharge location 005. Sediment pond locations are shown on Drawing 5-25. The UPDES permit identifies monitoring frequency and required parameters, effluent limitations, and storm water requirements.

The Operator has submitted data electronically to the Division's water database this quarter. Special Condition No. 1 of the mine Permit requires the Operator to submit water quality data for the Coal Hollow Mine in an electronic format through the Electronic Data Input web site.

No UPDES Outfalls discharged during Q2 2014.

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

**Springs**      **YES [X] NO [ ]**

**Streams**      **YES [X] NO [ ]**

Stream samples were analyzed for the required operational monitoring parameters specified in the MRP. Special Condition No. 4 of the mine Permit requires the Permittee to monitor for selenium where water leaves the mine site, during operational and reclamation phases. All operational samples from stream sites are being analyzed for dissolved selenium, while only BLM-1, SW-5, SW-6, and SW-9 are required.

**Wells**      **YES [X] NO [ ]**

**UPDES**      **YES [X] NO [ ]**

The Operator has submitted data electronically to the Division's water database. In addition to the monitoring requirements established by the UPDES permit, Special Condition No. 4 of the mine Permit requires the Permittee to monitor for selenium where water leaves the mine site, during operational and reclamation phases.

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

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

**Springs**      **YES [X] NO [ ]**

See Total Selenium levels in Springs (Figure 2). There was a significant spike in levels early in the year that have since gone down.

- SP-14 June – TDS,  $\text{SO}_4^{-2}$
- SP-20 June – TDS, total alkalinity,  $\text{SO}_4^{-2}$
- SP-4 June – D-Na
- SP-8 June – TDS, Cat-Ani

**Streams**      **YES [X] NO [ ]**

See Total Selenium levels in Streams (Figure 2). There was a significant spike in levels early in the year that have since gone down.

- BLM-1 June – T-Alk, Bcrb  $\text{CaCO}_3$ , D-Mg
- SW-3 June – Carb  $\text{CaCO}_3$
- SW-8 June – Carb  $\text{CaCO}_3$ , D-K

**Wells**      **YES [X] NO [ ]**

See Total Selenium levels in Wells (Figure 2). There was a significant spike in levels early in the year that have since gone down. Well 102 dropped in level, but this may be as seasonal pattern (Figure 1).

- LR-45 June – Cl, D-Na, T-Cats
- LS-28 June – T-Ca
- LS-85 June –  $\text{SO}_4^{-2}$
- SS-30 June – TDS, D-Mg, T-Cats, Cat-Ani
- UR-70 June – Wat. Temp, D-Ca,  $\text{SO}_4^{-2}$ , T-Anis
- Y-101 June – Depth
- Y-61 June – T-Alk,  $\text{SO}_4^{-2}$

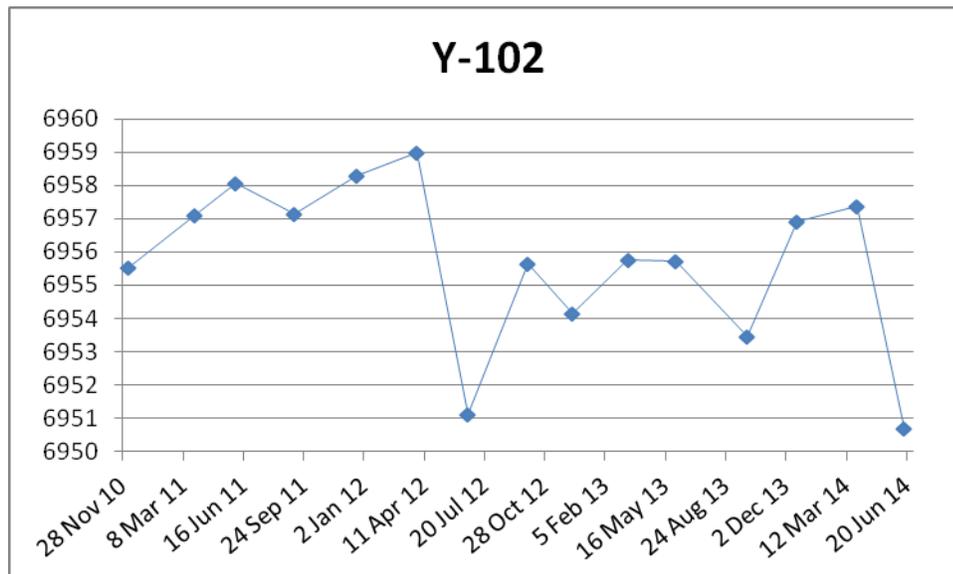
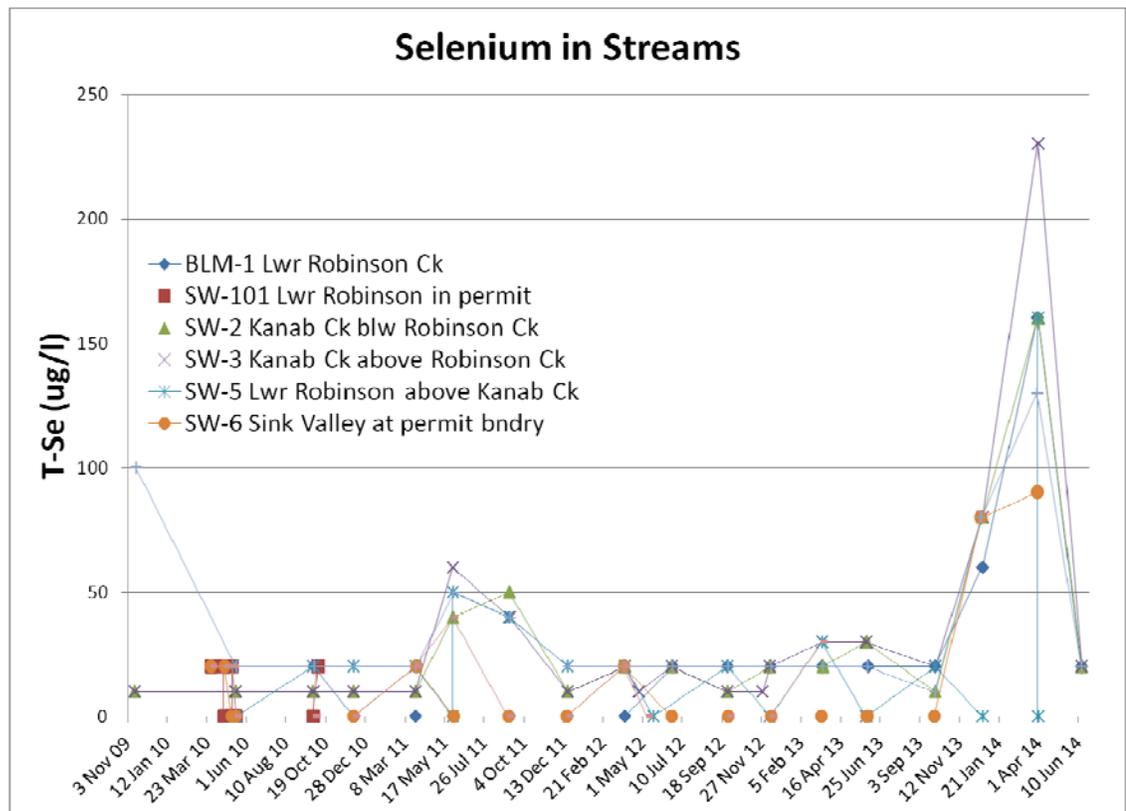
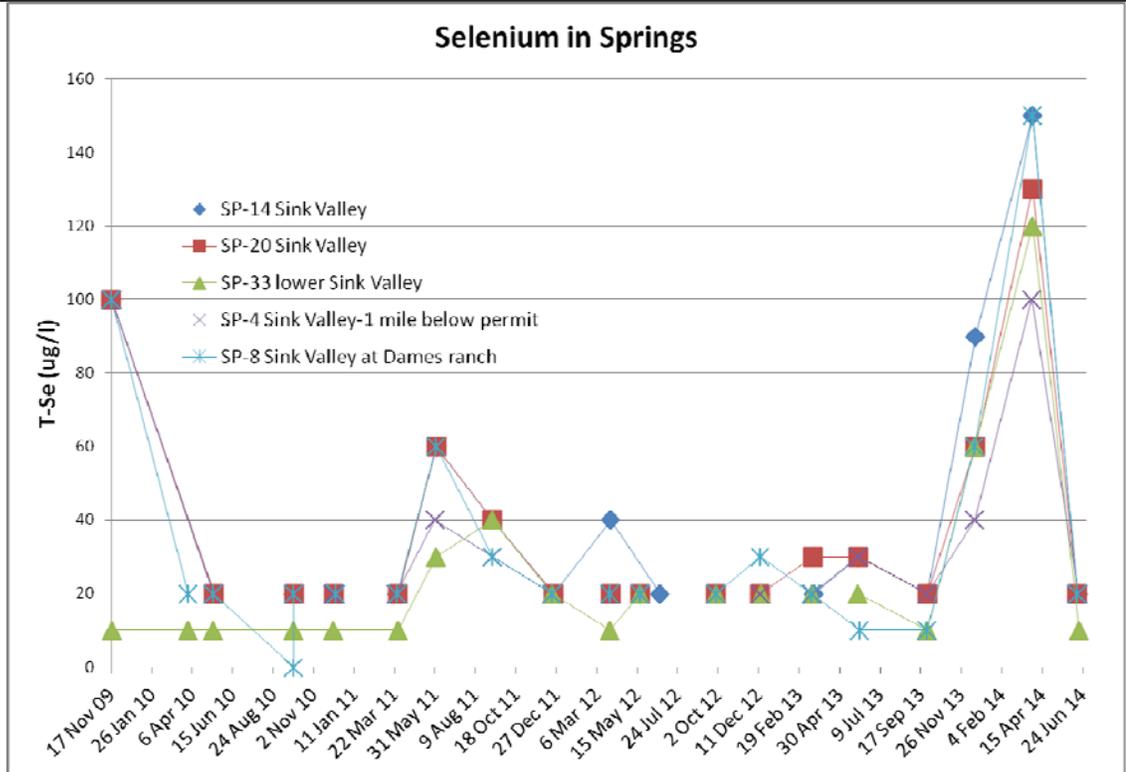


Figure 1. Well Y-102: Alluvial well in upper Sink Valley to the east of pit 9 in permit area.



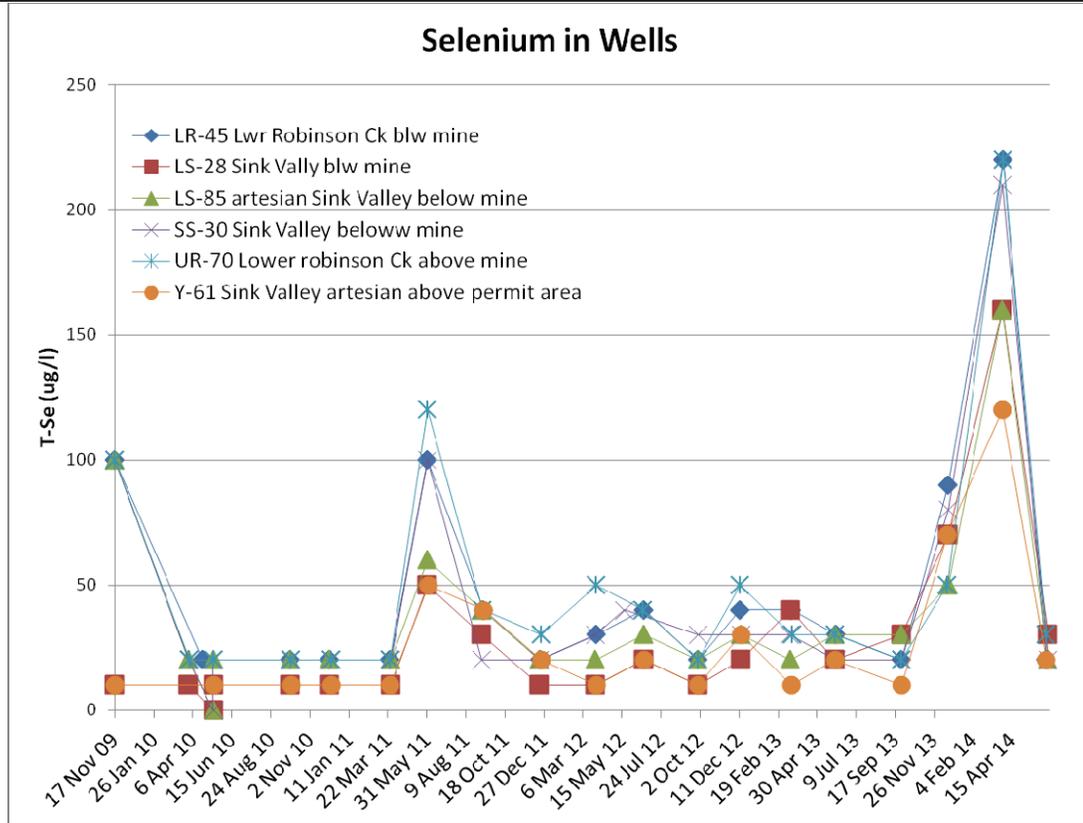


Figure 2. Elevated Selenium levels at Spring, Stream, and Well sampling locations in Q2 2014.

UPDES YES [ ] NO [ X ]

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

Re-sampling for baseline parameters is due every five years during the third or first quarter. Baseline parameters for surface water and groundwater monitoring are listed in Table 7-6B and Table 7-7B, respectively. Assuming that the five-year baseline resampling will coincide with permit renewal, the next baseline resampling is due during third or fourth quarter 2015.

**5. Based on your review, what further actions, if any, do you recommend? YES [ ] NO [X]**

None, however tracking the water elevation in well Y-102 would be worth continued examination. Continue to monitor elevated selenium in springs, streams, and wells.

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

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

None