

WATER QUALITY M E M O R A N D U M

Utah Coal Regulatory Program

December 21, 2011

TO: Internal File

THRU: Daron Haddock, Permit Supervisor *DH*

FROM: Steve Christensen, Environmental Scientist III *SC*

RE: 2011 Second Quarter Water Monitoring, Consolidation Coal Company, Hidden Valley Mine, C/015/0007-WQ11-2, Task ID #3840

The Hidden Valley Mine is in reclamation. At present, the Permittee has no immediate plans for additional coal mining activity at the site. Two surface-water monitoring sites are established to monitor Ivie Creek, a perennial stream adjacent to the mine site. The sites; Upper Ivie #1, and Lower Ivie #2, have been established to quantify any changes in quality or quantity to the Ivie Creek drainage as a result of coal mining related activity. Due to the lack of springs in the area and the lack of underground development/activity, no ground water monitoring is required at this time by the approved Mining and Reclamation Plan (MRP).

Section UMC 817.52 of the approved MRP discusses the water-monitoring plan. The two surface monitoring sites will be sampled and measured during the months of May and September (2nd and 3rd quarters only). Field parameters will be measured and water samples collected at the same time. Parameters for water analysis are listed in section UMC817.52 of the MRP. There are no springs, ponds or wells on the site. The monitoring program will continue until bond release is obtained.

The Utah Division of Water Quality (DWQ) has assigned use classifications to Ivie Creek and its tributaries from the confluence with Muddy Creek to Utah highway 10. The classifications are:

- 2B: Protected for secondary contact recreation such as boating, wading or similar uses.
- 3C: Protected for non-game fish and other aquatic life, including necessary aquatic organisms in their food chain.
- 4: Protected for agricultural uses including irrigation of crops and stock watering.

Numeric criteria set forth in Utah Administrative Code (UAC) R317-14, have been established for each of the beneficial use classes assigned to waters in the State. Of the use classifications assigned to the streams in the Western Colorado River Watershed (WCRW), numeric criteria for TDS only apply for agricultural use (beneficial use class 4). Section R317-2

of the UAC identifies a standard TDS value of 2,600 mg/L for Ivie Creek and its tributaries. The primary factors for increased TDS loads in the lower reaches of the Muddy Creek Watershed are from agricultural irrigation practices, surface runoff and natural geological loadings.

1. Was data submitted for all of required sites?

Streams

YES NO Data was reported for both surface water monitoring sites (Upper Ivie #1 and Lower Ivie #2).

2. Were all required parameters reported for each site?

Streams YES NO

3. Were irregularities found in the data?

Streams YES NO

The Permittee reported highly elevated flow values for both Upper Ivie #1 and Lower Ivie #2. The elevated flows are in all likelihood the result of the high snowfall amounts this past winter. The flows appear to have produced a flushing effect on Ivie Creek producing elevated levels of conductivity and bicarbonate values.

Sample ID	Date	Parameter	Value	STD. Deviation
Ivie #1	5/20/11	Flow	4,263 gpm	2.76
Ivie #1	5/20/11	Bcarb	195 ppm	2.10
Ivie #1	5/20/11	T-Anis	13.91 meq/l	2.20
Ivie #2	5/20/11	SO4	422 ppm	2
Ivie #2	5/20/11	L-Sp Cond	1,259 umhos/c	2.05
Ivie #2	5/20/11	T-Cats	13.98 mep/l	2.28
Ivie #2	5/20/11	T-Anis	14.19 meq/l	2.34
Ivie #2	5/20/11	Conductivity	1,240 umhos/c	2.06
Ivie #2	5/20/11	Flow	4,488 gpm	3.56
Ivie #2	5/20/11	Bcarb	192 ppm	2.9

A TDS value of 2,600 mg/L is the site-specific standard as established by UAC R317-2, *Standards for Waters of the State*. The TDS values obtained for both Upper Ivie #1 and Lower Ivie #2 for this quarter were 900 and 912 mg/L respectively.

The Price River, San Rafael River and Muddy Creek TMDLs for Total dissolved Solids West Colorado Watershed Management Unit; Utah document (Utah Division of Water Quality, 2004) discusses how seasonal variations in TDS concentrations have been detected.

Based upon previous sampling data, seasonal TDS trends for the Ivie Creek drainage produce higher values during the 2nd quarter (spring/early summer) as opposed to the 3rd quarter (late summer/ fall). As a result of snowmelt, irrigation return flow and increased precipitation during the spring/early summer months, it would appear that the ephemeral drainages that contribute flow to Ivie Creek experience a flushing event that produces higher TDS values.

Due to the general lack of appreciable precipitation for the area (averaging <10"/year annually), the relatively large network of ephemeral drainages in the Ivie Creek watershed remain dry for a majority of the year. As a result, there are significant periods of time where sediments may be deposited in these ephemeral drainages by wind erosion. Following the spring 'flushing event', the data clearly shows that TDS values drop significantly between the 2nd and 3rd quarter of the year as the sediment has been washed down gradient.

Historically, the Ivie Creek drainage has produced TDS levels well above the 2,600-mg/L standard discussed above. However, as the site has been reclaimed and in stable condition, it's unlikely that the elevated TDS levels are a result of coal mining related activity. Recent field inspections by Division staff have documented the site as being in stable condition with no signs of excessive erosion or gullies. TDS values for this quarter were well below the 2,600 mg/L standard with Ivie #1 and Ivie #1 producing TDS values of 900 mg/L and 912 mg/L respectively.

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

The approved MRP does not outline a five-year baseline re-sampling requirement.

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

NA

Does the Mine Operator need to submit more information to fulfill this quarter's monitoring requirements?

YES NO

6. Follow-up from last quarter, if necessary. Did the Mine Operator submit all the missing and/or irregular data (datum)?

NA.

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