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C007001 Internal

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# MEMORANDUM

## Utah Coal Regulatory Program

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November 1, 2010

TO: Internal File

THRU: James D. Smith, Permit Supervisor *JDS 01 Nov 2010*

FROM: Kevin Lundmark, Environmental Scientist II *KWC*

RE: July 29 and August 26, 2010 Water Sampling and Analysis, White Oak Mine Site, C0070001

During a site visit at the White Oak Mine on June 24, 2010, orange staining was observed within a discrete reach of the Whiskey Creek channel. The orange staining appeared to originate from groundwater seepage within the channel (see Photo 1), and the staining was observed to dissipate over a distance of approximately 20 feet (see Photo 2). The orange staining was believed to be precipitated iron hydroxide occurring during low-flow conditions.

Representatives from the Division visited the Site on July 29, 2010 (see Inspection report 2443). Heavy rain fell that morning and upon arrival at the Site Whiskey Creek was observed to be flowing at a discharge rate of hundreds of gallons per minute. No weir or flow meters were available to measure the discharge, so this is a visual estimate. The heavy discharge in the creek prevented the observation or water sampling in the location where orange staining had been observed. A grab sample of stream flow from Whiskey Creek was collected (sample ID "WC-1") and submitted to the Unified State Laboratory of chemical analysis (see Photo 3). Field parameters were also measured at the time of sampling (see Photo 4). Analytical results and field measurements are summarized in the attached table.

The Division made a second attempt to investigate the orange staining in the Whiskey Creek channel on August 26, 2010. On this date, the Whiskey Creek channel was dry except in the area where the orange staining was observed. A sample of the groundwater seepage in this location was collected (sample ID "WC-ORANGE") and field measurements were collected. A groundwater seep was also observed and sampled on the north bank of Whiskey Creek upgradient (west) of location WC-ORANGE. The sample collected at the groundwater seep from the north bank of Whiskey Creek was identified as "WC-SEEP". Samples WC-ORANGE and WC-SEEP were both collected by creating a water pool using a shovel then placing a section of ½ inch PVC pipe in the earthen embankment. After allowing the water to run through the PVC pipe for several minutes, the samples were collected directly into laboratory-provided sample bottles.

**TECHNICAL MEMO**

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Photo 1. Orange staining in Whiskey Creek  
Channel 6/24/2010



Photo 2. Orange staining in Whiskey Creek  
Channel 6/24/2010



Photo 3. Storm event flow in Whiskey Creek on 7/29/2010. Sample location WC-1 is shown by arrow.



Photo 4. Collection of sample WC-1 on 7/29/2010

A water sample was also collected at the White Oak Loadout site on August 26, 2010 and assigned a sample ID “WO-LOADOUT”. The WO-LOADOUT sample was a grab sample

**TECHNICAL MEMO**

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collected from a 4-inch pipe discharging inside the 36-inch culvert C-14-42 below the railroad tracks at the Loadout. Orange precipitate was observed on April 27, 2010 in the culvert and at its outfall near Mud Creek (see Inspection Report 2338).

Field measurements and laboratory analytical results for the sampling performed July 29 and August 26, 2010 are provided in the table below. Laboratory analytical reports are included as an attachment.

Sample ID Date / Time	WC-1 7/29/10 10:20	WC-ORANGE 8/26/10 11:35	WC-SEEP 8/26/10 11:45	WO-LOADOUT 8/26/10 12:15
GPS Location (NAD27 State Plane Feet)	n/a	486078 N, 2088683 E	486005 N, 2088567 E	496921 N, 2097014 E
pH (field)	8.24	6.70	7.91	7.16
Temp (C, field)	14.1	12.8	12.2	9.1
Iron (total, mg/L)	10.8	17.0	0.572	1.73
TDS (mg/L)	830	1902	1606	498
TSS (mg/L)	10550	n/a	n/a	n/a
Sulfate (mg/L)	n/a	319.0	525.0	74.3
Alkalinity (mg/L)	n/a	500	308	382
Ammonia-N (mg/L)	0.059	n/a	n/a	n/a
Nitrate+Nitrite (mg/L)	0.648	n/a	n/a	n/a
Phosphorus (total, mg/L)	8.3	n/a	n/a	n/a

n/a = not available or not analyzed

UTAH STATE DEPARTMENT OF HEALTH  
DIVISION OF LABORATORY SERVICES  
Environmental Chemistry Analysis Report

RECEIVED  
SEP 07 2010  
DIV. OF OIL, GAS & MINING

DEPT OF NATURAL RESOURCES - OGM  
ATTN; KEVIN LUNDMARK  
1594 W NORTH TEMPLE - STE 1210  
SALT LAKE CITY

UT 84114-1210

801-538-5352

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Lab Number: 201003779      Sample Type: 04      Cost Code: 900B  
Description: WC-1  
Collector: KWC

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Site ID: WT1177	Source No: 00	Organic Review:	
Sample Date: 07/29/2010	Time: 10:20	Inorganic Review:	08/30/2010
		Radiochemistry Review:	
		Microbiology Review:	

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TEST RESULTS:

Ammonia N	0.059 mg/l	NO2+NO3, N	0.648 mg/l
T-Iron	10.8 mg/l	T. Phos.	8.3 mg/l
T.Sus.Sol	10550.0 mg/l	TDS @ 180C	830 mg/l

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QUALIFYING COMMENTS (\*) on test results: NO COMMENTS

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END OF REPORT

UTAH STATE DEPARTMENT OF HEALTH  
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SEP 16 2010  
DIV. OF OIL, GAS & MINING

DEPT OF NATURAL RESOURCES - OGM  
ATTN; KEVIN LUNDMARK  
1594 W NORTH TEMPLE - STE 1210  
SALT LAKE CITY UT 84114-1210

801-538-5352

Lab Number: 201004745 Sample Type: 04 Cost Code: 900B  
Description: WC-ORANGE  
Collector: KWL

Site ID: Source No: 00 | Organic Review:  
Sample Date: 08/26/2010 Time: 11:35 | Inorganic Review: 09/09/2010  
Radiochemistry Review:  
Microbiology Review:

TEST RESULTS:

Bicarbonate	610 mg/l	CO3 Solids	300 mg/l
Carb. Diox	112 mg/l	Carbonate	0 mg/l
Hydroxide	0 mg/l	L-pH	6.94
Sulfate *	319.0 mg/l	T-Iron	17.0 mg/l
TDS @ 180C	1902 mg/l	Tot. Alk.	500 mg/l

5185

QUALIFYING COMMENTS (\*) on test results:

Sulfate... MatrixSpike %Rec was greater than QC Limit indicating  
Matrix Interference

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SEP 23 2010

DEPT OF NATURAL RESOURCES - OGM  
ATTN; KEVIN LUNDMARK  
1594 W NORTH TEMPLE - STE 1210  
SALT LAKE CITY

DIV. OF OIL, GAS & MINING

UT 84114-1210

801-538-5352

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Lab Number: 201004747      Sample Type: 04      Cost Code: 900B  
Description: WO-LOADOUT  
Collector: KWL

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Site ID:	Source No: 00	Organic Review:	
Sample Date: 08/26/2010	Time: 12:15	Inorganic Review:	09/21/2010
		Radiochemistry Review:	
		Microbiology Review:	

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TEST RESULTS:

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Bicarbonate	466 mg/l	CO3 Solids	229 mg/l
Carb. Diox	24 mg/l	Carbonate	0 mg/l
Hydroxide	0 mg/l	L-pH	7.49
Sulfate	74.3 mg/l	T-Iron	1.73 mg/l
TDS @ 180C	498 mg/l	Tot. Alk.	382 mg/l
	1480		

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QUALIFYING COMMENTS (\*) on test results: NO COMMENTS

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END OF REPORT