



UTAH DEPARTMENT of  
ENVIRONMENTAL QUALITY  
**WATER  
QUALITY**

# *Evaluation of UDEQ Water Quality Data Collected during Spring Runoff following the Gold King Mine Release*

Data Collected: February 16, 2016 – May 2, 2016

***Prepared and Reviewed by:***

Utah Department of Environmental Quality, Division of Water Quality

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## ***Introduction***

DEQ collected water samples weekly at seven different locations on the San Juan River and two tributaries, McElmo Creek and Montezuma Creek during the months of February, March, April, and the first week of May, 2016. These data were screened against recreational, drinking water, agricultural, and aquatic life criteria with exceedences shown in orange in the following tables. With the exception of aluminum criteria for aquatic life and total dissolved solids for agriculture no other exceedences of criteria were identified.

## Standards and Screening Values used in Evaluation of San Juan River Water Quality Samples and Finished Water Data

The table below summarizes applicable water quality standards for the San Juan River (R317-2-14), Utah's drinking water standards (R309-200-5) applicable to public drinking water systems regulated by the State of Utah, as well as screening values for recreational and agricultural uses. Recreational screening values were developed by the Utah Department of Health's [Environmental Epidemiology Program](#) (EEP). These values reflect the water contaminant concentrations that would exceed established ATSDR minimal risk levels (MRL), or EPA reference doses (RfD) if an appropriate MRL does not exist, for the most susceptible population: children under the age of five years. These recreational screening values assume an exposure duration of 60 days, with two hours/day spent in the water. The accidental ingestion rate accounts for 50 mL of river water per hour, and total body contact with the water for that two hour time period. An exceedance of these values does not necessarily indicate that adverse health effects will occur; rather, it is used as guidance for health professionals to further determine the likelihood that adverse health effects may occur due to the exposure. Agricultural screening values are derived from National Academy of Science (NAS) Water Quality Criteria, 1972 (the Blue Book). Those guidelines are reprinted in [EPA's Guidelines for the Reuse of Waters for Irrigation](#). Dissolved metal values were used for the assessment of agricultural use waters. Estimated results values below the laboratory's reporting limit are evaluated in this analysis. These results generally show low level concentrations and do not significantly affect the analysis outcome.

Analyte	CAS #	Units	Utah WQ Standards (R317-2-14) for San Juan River Uses				Recreational Screening Values [Total Metals]	Agricultural Screening Values [Dissolved Metals]			Analyte
			1C (Domestic)	3B (warm water fish) [1-hour]	3B (warm water fish) [4-day]	4 (agriculture)		Livestock Water (ug/L)	Long-Term Irrigation Waters (ug/L) [NAS, 1972]	Short-Term Irrigation Waters (ug/L) [NAS, 1972]	
Hardness	-	mg/L						180 mg/L (UA)			Hardness
Aluminum	7429-90-5	µg/L		750	87		620,767	5,000 (NAS)	5,000	20,000	Aluminum
Antimony	7440-36-0	µg/L					248	No Data Available	No Data Available	No Data Available	Antimony
Arsenic	7440-38-2	µg/L	10	340	150	100	186	200 (NAS)	100	2,000	Arsenic
Barium	7440-39-3	µg/L	1000				124,159	No Data Available	No Data Available	No Data Available	Barium
Beryllium	7440-41-7	µg/L	<4				1,242	No Data Available	No Data Available	No Data Available	Beryllium
Cadmium	7440-43-9	µg/L	10	2	0.25	10	62	50 (NAS)	10	50	Cadmium
Calcium	7440-70-2	µg/L						500,000 (UA)	No Data Available	No Data Available	Calcium
Chromium	7440-47-3	µg/L	50	16 (VI); 570 (III)	11 (VI); 74 (III)	100	410	1,000 (NAS)	100	1,000	Chromium
Cobalt	7440-48-4	µg/L					7,931	1,000 (NAS)	50	5,000	Cobalt
Copper	7440-50-8	µg/L		13	9	200	6,208	500 (NAS)	200	5,000	Copper
Iron	7439-89-6	µg/L		1000	1000		851,582	Limit Not Considered Necessary (NAS)	5,000	20,000	Iron
Lead	7439-92-1	µg/L	15	65	2.5	100	910	100 (NAS)	5,000	10,000	Lead
Magnesium	7439-95-4	µg/L						250,000 (UA)	No Data Available	No Data Available	Magnesium
Manganese	7439-96-5	µg/L					31,040	Limit Not Considered Necessary (NAS)	200	10,000	Manganese
Mercury	7439-97-6	µg/L	2	-	0.012		1,242	10 (NAS)	No Data Available	No Data Available	Mercury
Molybdenum	7439-98-7	µg/L					3,104	No Data Available	10	50	Molybdenum
Nickel	7440-02-0	µg/L		468	52		17,480	No Data Available	200	2,000	Nickel
Potassium	7440-22-4	µg/L						No Data Available	No Data Available	No Data Available	Potassium
Selenium	7782-49-2	µg/L	50	18.4	4.6	50	3,104	50 (NAS)	20	20	Selenium
Silver	7440-22-4	µg/L	50	1.6	-		3,630	No Data Available	No Data Available	No Data Available	Silver
Sodium	7440-23-5	µg/L						1,000,000 (UA)	No Data Available	No Data Available	Sodium
Thallium	7440-28-0	µg/L					25	No Data Available	No Data Available	No Data Available	Thallium
Vanadium	7440-62-2	µg/L					6,208	100 (NAS)	100	1,000	Vanadium
Zinc	7440-66-6	µg/L		120	120		217,786	25,000 (NAS)	2,000	10,000	Zinc
TDS		mg/L						1200 (Utah)	500,000-1,000,000 (NAS)		
pH								6.5-9 (Utah)	4.5-9 (NAS)		

RMEG: ATSDR Reference Dose Media Evaluation Guide  
 EMEG: ATSDR Environmental Media Evaluation Guide  
 RSL: EPA Regional Screening Level

## **Domestic Source Water Quality Criteria - Dissolved Metals**

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### ***Comparison of San Juan River, McElmo Creek, and Montezuma Creek Raw Water Data with Water Quality Standards (R317-2-14) for Domestic Source Water - Dissolved Metals***

The dissolved water concentrations of metals and metalloids were compared to the Utah's water quality standards for the Class 1C use of protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water. No samples exceeded standards for domestic source water.

# Domestic Source Water Screening Values - Dissolved Metals

Domestic Source Water (Dissolved Metals)				No Exceedence		Above Screening Level																				
Domestic Source Screening Values				Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc		
Monitoring Location	Site Description	Collection Date	Collection Time	ug/L	ug/L	10 ug/L	1,000 ug/L	4 ug/L	10 ug/L	50 ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L		
4954000	San Juan R @ US160 Xing in CO	2/16/2016	3:00 PM	319.3	ND	ND	186.9	ND	ND	ND	ND	6.0	155.0	0.5	14.4	ND	1.5	ND	3.1	1.6	ND	ND	ND	22.5		
		2/23/2016	10:10 AM	14.9	ND	ND	ND	ND	ND	ND	ND	1.8	ND	ND	ND	ND	1.4	ND	3.1	1.2	ND	ND	ND	ND		
		2/29/2016	4:00 PM	10.4	ND	ND	ND	ND	ND	ND	ND	1.7	ND	ND	ND	ND	1.2	ND	2.6	1.1	ND	ND	ND	ND		
		3/9/2016	8:20 AM	17.3	ND	ND	ND	ND	ND	ND	ND	1.0	ND	ND	ND	ND	1.2	ND	2.3	ND	ND	ND	ND	ND		
		3/15/2016		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3	ND	2.2	ND	ND	ND	ND	ND		
		3/22/2016	9:30 AM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	ND	2.2	ND	ND	ND	ND	ND	ND	
		3/28/2016	4:50 PM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	ND	2.2	ND	ND	ND	ND	ND	ND	
		4/4/2016	12:20 PM	52.3	ND	ND	ND	ND	ND	ND	ND	ND	2.4	36.2	0.1	5.3	ND	1.4	ND	2.5	ND	ND	ND	ND	ND	ND
		4/12/2016	2:00 PM	31.0	ND	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	1.3	ND	2.0	ND	ND	ND	ND	ND	ND	ND
		4/19/2016	12:25 PM	18.5	ND	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	1.2	ND	1.9	ND	ND	ND	ND	ND	ND	ND
		4/26/2016	11:45 AM	29.3	ND	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	ND	1.4	ND	2.0	ND	ND	ND	ND	ND	ND	ND
		5/2/2016	2:00 PM	24.5	ND	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	5.9	ND	1.1	ND	2.2	ND	ND	ND	ND	ND	ND
4953880	McElmo Creek at U262 xing near Town of Montezuma Creek	2/23/2016	5:35 PM	ND	ND	1.1	ND	ND	ND	ND	ND	1.6	ND	ND	12.7	ND	3.0	ND	6.8	2.0	ND	ND	ND	ND	ND	
		2/29/2016	5:00 PM	69.6	ND	ND	ND	ND	ND	ND	ND	2.1	24.7	ND	20.1	ND	3.2	ND	5.3	2.5	ND	ND	ND	ND	ND	
		3/9/2016	9:05 AM	ND	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	18.6	ND	3.0	ND	5.0	2.0	ND	ND	ND	ND	ND	
		3/15/2016	9:20 AM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.6	ND	3.1	ND	4.5	ND	ND	ND	ND	ND	ND	
		3/22/2016	10:30 AM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.7	ND	3.3	ND	4.6	1.2	ND	ND	ND	ND	ND	
		3/28/2016	5:40 PM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	27.5	ND	3.7	ND	5.1	ND	ND	ND	ND	ND	ND	
		4/4/2016	1:30 PM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	25.7	ND	3.8	ND	4.8	ND	ND	ND	ND	ND	ND	
		4/12/2016		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	46.7	ND	5.4	ND	4.2	1.7	ND	ND	ND	ND	ND	
		4/19/2016	11:40 AM	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5	ND	0.1	43.3	ND	4.6	ND	5.1	2.3	ND	ND	ND	ND	ND
		4/26/2016	11:00 AM	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	69.1	ND	5.5	ND	5.8	ND	ND	ND	ND	ND	ND
5/2/2016	1:30 PM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14.1	ND	3.9	ND	5.5	1.1	ND	ND	ND	ND	ND	ND		
4953990	San Juan R @ Town of Montezuma	2/16/2016	4:15 PM	231.2	ND	ND	161.7	ND	ND	ND	ND	3.5	109.0	0.3	8.8	ND	1.7	ND	3.5	1.4	ND	ND	ND	18.1		
		2/23/2016	6:00 PM	18.5	3.5	ND	ND	ND	ND	ND	ND	1.7	ND	0.2	ND	ND	1.8	ND	3.5	1.6	ND	ND	ND	ND		
		2/29/2016	5:30 PM	22.4	ND	ND	ND	ND	ND	ND	ND	1.4	ND	ND	ND	ND	1.4	ND	2.8	ND	ND	ND	ND	ND		
		3/9/2016	10:00 AM	34.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3	ND	2.4	ND	ND	ND	ND	ND	ND	
		3/15/2016		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND	2.4	ND	ND	ND	ND	ND		
		3/22/2016	10:55 AM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND	2.4	ND	ND	ND	ND	ND		
		3/28/2016	3:45 PM	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ND	ND	ND	1.3	ND	2.2	ND	ND	ND	ND	ND		
		4/4/2016	2:00 PM	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	1.5	ND	2.5	ND	ND	ND	ND	ND		
		4/12/2016	1:00 PM	26.2	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	1.3	ND	2.1	ND	ND	ND	ND	ND	ND		
		4/19/2016	11:10 AM	50.9	ND	ND	ND	ND	ND	ND	ND	1.5	29.7	ND	8.2	ND	1.3	ND	2.0	1.4	ND	ND	ND	ND	ND	
		4/26/2016	10:30 AM	18.1	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	1.3	ND	2.2	ND	ND	ND	ND	ND	ND		
5/2/2016	1:00 PM	16.7	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	1.1	ND	2.1	ND	ND	ND	ND	ND	ND				
4953560	Montezuma Creek at U163 xing	2/23/2016	6:30 PM	ND	ND	2.9	106.3	ND	ND	ND	ND	2.9	ND	ND	ND	3.6	ND	6.3	3.6	ND	ND	ND	ND	ND		
		2/29/2016	5:40 PM	ND	ND	3.1	242.1	ND	ND	ND	ND	3.9	ND	ND	6.3	ND	4.8	ND	8.7	4.1	ND	ND	ND	ND		
		3/9/2016	9:40 AM	12.2	ND	2.5	125.7	ND	ND	ND	ND	2.8	ND	ND	9.9	ND	5.4	ND	7.5	3.5	ND	ND	ND	ND		
		3/15/2016	10:20 AM	ND	ND	2.4	127.5	ND	ND	ND	ND	1.9	ND	ND	58.6	ND	5.9	ND	8.5	ND	ND	ND	ND	ND		

# Domestic Source Water Screening Values - Dissolved Metals

Domestic Source Water (Dissolved Metals)																												
No Exceedence				Above Screening Level																								
Domestic Source Screening Values				Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Thallium	Vanadium	Zinc				
Monitoring Location	Site Description	Collection Date	Collection Time	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L				
4953250	San Juan R @ Sand Island	2/16/2016	5:00 PM	128.5	ND	1.0	104.8	ND	ND	ND	ND	2.7	71.7	0.2	ND	ND	1.7	ND	3.3	1.5	ND	ND	ND	ND	ND			
		2/24/2016	8:40 AM	34.8	ND	ND	ND	ND	ND	5.4	ND	2.0	57.2	0.2	6.9	ND	1.6	ND	3.0	1.3	ND	ND	ND	ND	ND	ND		
		3/1/2016	8:15 AM	60.1	ND	ND	ND	ND	ND	ND	ND	1.3	44.2	ND	ND	ND	1.4	ND	2.7	1.3	ND	ND	ND	ND	ND	ND		
		3/9/2016	12:10 PM	10.0	ND	ND	ND	ND	ND	ND	ND	1.0	ND	ND	ND	ND	1.3	ND	2.4	ND	ND	ND	ND	ND	ND	ND		
		3/15/2016	11:00 AM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5	ND	2.6	ND	ND	ND	ND	ND	ND	ND		
		3/22/2016	11:40 AM	10.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND	2.4	ND	ND	ND	ND	ND	ND	ND	ND	
		3/29/2016	9:50 AM	16.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND	2.2	ND	ND	ND	ND	ND	ND	ND	ND	
		4/4/2016	2:40 PM	14.6	ND	ND	ND	ND	ND	ND	ND	1.0	ND	ND	ND	ND	1.5	ND	2.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
		4/12/2016	10:30 AM	18.2	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	1.4	ND	2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
		4/19/2016	10:17 AM	16.0	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	ND	ND	1.2	ND	2.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
		4/26/2016	10:00 AM	12.7	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	1.4	ND	2.3	ND	ND	ND	ND	ND	ND	ND	ND	ND
		5/2/2016	12:00 PM	15.9	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	1.2	ND	2.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
4953000	San Juan R @ Mexican Hat US163 Xing	2/17/2016	9:00 AM	57.7	ND	1.0	ND	ND	ND	ND	ND	2.0	37.2	0.1	ND	ND	1.7	ND	3.0	1.6	ND	ND	ND	ND	ND	ND		
		2/24/2016	9:20 AM	ND	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	ND	ND	1.6	ND	2.9	1.3	ND	ND	ND	ND	ND	ND	ND	
		3/1/2016	9:00 AM	21.6	ND	1.1	ND	ND	ND	ND	ND	1.4	ND	ND	ND	ND	1.6	ND	2.7	1.3	ND	ND	ND	ND	ND	ND	ND	ND
			9:10 AM	16.9	ND	1.0	ND	ND	ND	ND	ND	2.0	ND	ND	ND	ND	1.4	ND	2.7	1.0	ND	ND	ND	ND	ND	11.3	ND	
		3/9/2016	11:30 AM	17.7	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	ND	ND	1.4	ND	2.5	ND	ND	ND	ND	ND	ND	ND	ND	
		3/15/2016	11:45 AM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5	ND	3.3	ND	ND	ND	ND	ND	ND	ND	ND	
		3/22/2016	12:25 PM	10.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5	ND	2.5	ND	ND	ND	ND	ND	ND	ND	ND	
		3/29/2016	8:55 AM	16.8	ND	ND	ND	ND	ND	ND	ND	1.0	ND	ND	ND	ND	1.4	ND	2.2	ND	ND	ND	ND	ND	ND	ND	ND	
		4/4/2016	3:30 PM	ND	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	1.5	ND	2.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
		4/12/2016	11:15 AM	19.0	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	1.5	ND	2.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
		4/19/2016	9:33 AM	150.4	ND	ND	119.8	ND	ND	ND	ND	1.3	83.5	ND	ND	ND	1.3	ND	2.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
		4/26/2016	8:30 AM	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	ND	ND	1.7	ND	2.3	ND	ND	ND	ND	ND	ND	ND	ND	ND
5/2/2016	11:00 AM	16.3	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	1.1	ND	2.1	ND	ND	ND	ND	ND	ND	ND	ND	ND		
4952942	San Juan R @ Clay Hills	2/17/2016	10:30 AM	162.9	ND	1.1	112.5	ND	ND	ND	ND	2.3	77.5	0.2	5.5	ND	1.7	ND	3.1	1.7	ND	ND	ND	ND	11.9	ND		

## Aquatic Life Water Quality Criteria

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### ***Comparison of San Juan River, McElmo Creek, and Montezuma Creek Raw Water Data with Water Quality Criteria (R317-14-2) for Aquatic Life Use (Warm-water Fishery) – Dissolved Metals***

The water concentrations of metals and metalloids were compared to Utah's chronic and acute water quality standards for the Class 3B aquatic life use. All of Utah's aquatic life criteria are based on dissolved fractions with the exception of aluminum which is based on total recoverable fraction. The chronic aluminum standard was exceeded at all sample locations on almost all dates although maximum concentrations were not as high as the previous summary report where values exceeded 100,000 µg/L at the Stateline, Montezuma, Sand Island, Mexican Hat, and Clay Hills sites.

No other exceedances of aquatic life criteria were observed however the analytical method used for mercury does not have sufficient sensitivity and the detection limit is higher than the standard. Therefore, all nondetect concentrations are too high to determine if the water concentrations comply with the standard and this remains a significant uncertainty.

# Aquatic Life Water Quality Criteria

Aquatic Life Use (Dissolved Metals)																								
				Above Screening Level																				
No Exceedence				Above Screening Level																				
				Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	
Utah Aquatic Life Use 1-hour				750		340			2	570		13	1000	65				468	18.4	1.6			120	
Utah Aquatic Life Use 4-hour				87		150			0.25	74		9	1000	2.5		0.012		52	4.6				120	
Monitoring Location	Site Description	Collection Date	Collection Time	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
4954000	San Juan R @ US160 Xing in CO	2/16/2016	3:00 PM	70,180	ND	ND	186.9	ND	ND	ND	ND	6.0	155.0	0.5	14.4	ND	1.5	ND	1.6	ND	ND	ND	22.5	
		2/23/2016	10:10 AM	2,475	ND	ND	ND	ND	ND	ND	ND	1.8	ND	ND	ND	ND	1.4	ND	1.2	ND	ND	ND	ND	
		2/29/2016	4:00 PM	3,282	ND	ND	ND	ND	ND	ND	ND	1.7	ND	ND	ND	ND	1.2	ND	1.1	ND	ND	ND	ND	
		3/9/2016	8:20 AM	2,887	ND	ND	ND	ND	ND	ND	ND	1.0	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND
		3/15/2016		1,544	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	ND	ND	ND	ND	ND
		3/22/2016	9:30 AM	528	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND
		3/28/2016	4:50 PM	256	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND
		4/4/2016	12:20 PM	1,408	ND	ND	ND	ND	ND	ND	ND	2.4	36.2	0.1	5.3	ND	1.4	ND	ND	ND	ND	ND	ND	ND
		4/12/2016	2:00 PM	674	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	1.3	ND	ND	ND	ND	ND	ND	ND
		4/19/2016	12:25 PM	2,047	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND
		4/26/2016	11:45 AM	3,183	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND
5/2/2016	2:00 PM	6,177	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	5.9	ND	1.1	ND	ND	ND	ND	ND	ND	ND		
4953880	McElmo Creek at U262 xing near Town of Montezuma Creek	2/23/2016	5:35 PM	1,124	ND	1.1	ND	ND	ND	ND	ND	1.6	ND	ND	12.7	ND	3.0	ND	2.0	ND	ND	ND	ND	
		2/29/2016	5:00 PM	2,249	ND	ND	ND	ND	ND	ND	2.1	24.7	ND	20.1	ND	3.2	ND	2.5	ND	ND	ND	ND	ND	
		3/9/2016	9:05 AM	385	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	18.6	ND	3.0	ND	2.0	ND	ND	ND	ND	
		3/15/2016	9:20 AM	4,814	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.6	ND	3.1	ND	ND	ND	ND	ND	ND	
		3/22/2016	10:30 AM	715	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.7	ND	3.3	ND	1.2	ND	ND	ND	ND	
		3/28/2016	5:40 PM	103	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	27.5	ND	3.7	ND	ND	ND	ND	ND	ND	
		4/4/2016	1:30 PM	65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	25.7	ND	3.8	ND	ND	ND	ND	ND	ND	ND
		4/12/2016		29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	46.7	ND	5.4	ND	1.7	ND	ND	ND	ND	
		4/19/2016	11:40 AM	116	ND	ND	ND	ND	ND	ND	ND	1.5	ND	0.1	43.3	ND	4.6	ND	2.3	ND	ND	ND	ND	ND
		4/26/2016	11:00 AM	16	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	69.1	ND	5.5	ND	ND	ND	ND	ND	ND	ND
		5/2/2016	1:30 PM	322	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14.1	ND	3.9	ND	1.1	ND	ND	ND	ND	ND
4953990	San Juan R @ Town of Montezuma	2/16/2016	4:15 PM	81,859	ND	ND	161.7	ND	ND	ND	ND	3.5	109.0	0.3	8.8	ND	1.7	ND	1.4	ND	ND	ND	18.1	
		2/23/2016	6:00 PM	1,703	3.5	ND	ND	ND	ND	ND	1.7	ND	0.2	ND	ND	1.8	ND	1.6	ND	ND	ND	ND	ND	
		2/29/2016	5:30 PM	3,441	ND	ND	ND	ND	ND	ND	1.4	ND	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	
		3/9/2016	10:00 AM	3,198	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND
		3/15/2016		2,224	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	
		3/22/2016	10:55 AM	429	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	
		3/28/2016	3:45 PM	211	ND	ND	ND	ND	ND	ND	ND	1.0	ND	ND	ND	ND	1.3	ND	ND	ND	ND	ND	ND	
		4/4/2016	2:00 PM	1,424	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	1.5	ND	ND	ND	ND	ND	ND	
		4/12/2016	692	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	1.3	ND	ND	ND	ND	ND	ND	ND	
		4/19/2016	11:10 AM	1,692	ND	ND	ND	ND	ND	ND	ND	1.5	29.7	ND	8.2	ND	1.3	ND	1.4	ND	ND	ND	ND	ND
		4/26/2016	10:30 AM	4,534	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	1.3	ND	ND	ND	ND	ND	ND	ND
5/2/2016	1:00 PM	3,269	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	1.1	ND	ND	ND	ND	ND	ND	ND		
4953560	Montezuma Creek at U163 xing	2/23/2016	6:30 PM	1,823	ND	2.9	106.3	ND	ND	ND	2.9	ND	ND	ND	3.6	ND	3.6	ND	3.6	ND	ND	ND	ND	
		2/29/2016	5:40 PM	1,078	ND	3.1	242.1	ND	ND	ND	3.9	ND	ND	6.3	ND	4.8	ND	4.1	ND	ND	ND	ND	ND	
		3/9/2016	9:40 AM	1,459	ND	2.5	125.7	ND	ND	ND	2.8	ND	ND	9.9	ND	5.4	ND	3.5	ND	ND	ND	ND	ND	
		3/15/2016	10:20 AM	77	ND	2.4	127.5	ND	ND	ND	1.9	ND	ND	58.6	ND	5.9	ND	ND	ND	ND	ND	ND	ND	



# Aquatic Life Water Quality Criteria

Aquatic Life Use (Dissolved Metals)																										
				No Exceedence																			Above Screening Level			
				Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc			
Utah Aquatic Life Use 1-hour				750		340			2	570		13	1000	65				468	18.4	1.6			120			
Utah Aquatic Life Use 4-hour				87		150			0.25	74		9	1000	2.5		0.012		52	4.6				120			
Monitoring Location	Site Description	Collection Date	Collection Time	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L			
4953250	San Juan R @ Sand Island	2/16/2016	5:00 PM	68,001	ND	1.0	104.8	ND	ND	ND	ND	2.7	71.7	0.2	ND	ND	1.7	ND	1.5	ND	ND	ND	ND	ND		
		2/24/2016	8:40 AM	1,580	ND	ND	ND	ND	ND	5.4	ND	2.0	57.2	0.2	6.9	ND	1.6	ND	1.3	ND	ND	ND	ND	ND	ND	
		3/1/2016	8:15 AM	3,321	ND	ND	ND	ND	ND	ND	ND	1.3	44.2	ND	ND	ND	1.4	ND	1.3	ND	ND	ND	ND	ND	ND	
		3/9/2016	12:10 PM	3,731	ND	ND	ND	ND	ND	ND	ND	1.0	ND	ND	ND	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND	
		3/15/2016	11:00 AM	1,900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	ND	
		3/22/2016	11:40 AM	545	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
		3/29/2016	9:50 AM	1,975	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
		4/4/2016	2:40 PM	295	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ND	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
		4/12/2016	10:30 AM	777	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
		4/19/2016	10:17 AM	1,003	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
		4/26/2016	10:00 AM	735	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
5/2/2016	12:00 PM	2,069	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND		
4953000	San Juan R @ Mexican Hat US163 Xing	2/17/2016	9:00 AM	70,228	ND	1.0	ND	ND	ND	ND	ND	2.0	37.2	0.1	ND	ND	1.7	ND	1.6	ND	ND	ND	ND	ND		
		2/24/2016	9:20 AM	2,268	ND	ND	ND	ND	ND	ND	ND	1.3	ND	ND	ND	1.6	ND	1.3	ND	ND	ND	ND	ND	ND	ND	
		3/1/2016	9:00 AM	3,766	ND	1.1	ND	ND	ND	ND	ND	1.4	ND	ND	ND	1.6	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND
			9:10 AM	2,078	ND	1.0	ND	ND	ND	ND	ND	2.0	ND	ND	ND	1.4	ND	1.0	ND	ND	ND	ND	ND	11.3	ND	
		3/9/2016	11:30 AM	4,030	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	
		3/15/2016	11:45 AM	2,385	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	
		3/22/2016	12:25 PM	1,759	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	
		3/29/2016	8:55 AM	501	ND	ND	ND	ND	ND	ND	ND	1.0	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		4/4/2016	3:30 PM	193	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		4/12/2016	11:15 AM	845	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		4/19/2016	9:33 AM	2,755	ND	ND	119.8	ND	ND	ND	ND	1.3	83.5	ND	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/26/2016	8:30 AM	5,230	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	ND	1.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
5/2/2016	11:00 AM	2,601	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
4952942	San Juan R @ Clay Hills	2/17/2016	10:30 AM	47,903	ND	1.1	112.5	ND	ND	ND	2.3	77.5	0.2	5.5	ND	1.7	ND	1.7	ND	ND	ND	ND	11.9	ND		
4953253	Duplicate of 4953550	3/22/2016	11:45 AM	514	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND		
		3/29/2016	10:00 AM	267	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND		
		4/26/2016	10:05 AM	707	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	

## Recreational Water Screening Values - Total Metals

### Comparison of San Juan River Raw Water Data with Recreational Water Screening Values - Total Metals

The Utah Department of Health's Environmental Epidemiology Program (EEP) has generated site-specific recreational screening values for metals and metalloid exposures to the San Juan River waters. These values reflect the water contaminant concentrations that would exceed established ATSDR minimal risk levels (MRL), or EPA reference doses (RfD) if an appropriate MRL does not exist, for the most susceptible population: children under the age of five years.

These recreational screening values assume an exposure duration of 60 days, with two hours/day spent in the water. The accidental ingestion rate accounts for 50 mL of river water per hour, and total body contact with the water for that two hour time period. An exceedance of these values does not necessarily indicate that adverse health effects will occur; rather, it is used as guidance for health professionals to further determine the likelihood that adverse health effects may occur due to the exposure.

No metal or metalloid exceeded a recreational screening value. Recreational exposures to San Juan River water is not expected to harm people's health.

Summary of Recreational Screening Values						
Contaminant	CV (µg/L)	Source	MRL (mg/kg/day)	Type	Screening Value	Units
Aluminum	10,000	I. EMEG	1.00E+00	Chronic	620,767	µg/L
Antimony	4	RMEG	4.00E-04	RfD	248	µg/L
Arsenic	3	C. EMEG	3.00E-04	Chronic	186	µg/L
Barium	2,000	I. EMEG	2.00E-01	Chronic	124,159	µg/L
Beryllium	20	C. EMEG	2.00E-03	Chronic	1,242	µg/L
Cadium	5	I. EMEG	1.00E-04	Chronic	62	µg/L
Chromium	60	Cr(VI) RSL	9.00E-04	Cr(VI) Chr.	410	µg/L
Cobalt	100	I. EMEG	1.00E-02	Intermediate	7,931	µg/L
Copper	100	I. EMEG	1.00E-02	Intermediate	6,208	µg/L
Iron	14,000	RSL	8.75E-01	UDOH	851,582	µg/L
Lead	15	RSL	9.37E-04	UDOH	910	µg/L
Manganese	500	RMEG	5.00E-02	RfD	31,040	µg/L
Mercury	0.63	RSL	2.00E-03	Intermediate	1,242	µg/L
Molybdenum	50	RMEG	5.00E-03	RfD	3,104	µg/L
Nickel	200	RMEG	2.00E-02	RfD	17,480	µg/L
Selenium	50	RMEG	5.00E-03	Chronic	3,104	µg/L
Silver	50	RMEG	5.00E-03	RfD	3,630	µg/L
Thallium	0.2	RSL	4.00E-05	PPRTV subchronic RfD	25	µg/L
Vanadium	100	I. EMEG	1.00E-02	Intermediate	6,208	µg/L
Zinc	3,000	I. EMEG	3.00E-01	Chronic	217,786	µg/L

## Recreational Water Screening Values - Total Metals

### Screening Value Calculations

Adapted from standard ATSDR exposure dose equations for ingestion and dermal exposures.

$$C = \frac{ED \times BW_i \times BW_d}{(BW_d \times IR_i \times EF_i \times CF_i) + (BW_i \times P_d \times SA_d \times ET_d \times CF_d)} ; \text{ where}$$

- C Concentration (mg/L) – these calculated values are converted to µg/L for screening values where appropriate.  
 ED Exposure dose (mg/kg/day)  
 BW<sub>i</sub> Child body weight for ingestion (16 kg)  
 BW<sub>d</sub> Child body weight for dermal (30kg)  
 IR<sub>i</sub> Intake rate for ingestion (0.1 L/day)  
 EF<sub>i</sub> Exposure factor for ingestion (0.1644 = 60 days/year)  
 CF<sub>i</sub> Conversion factor, ingestion (1 for mg/L entries)  
 SA<sub>d</sub> Surface area (whole body, which is 8,750 cm<sup>2</sup> for children)  
 ET<sub>d</sub> Exposure time (2 hour/day)  
 CF<sub>d</sub> Conversion factor, dermal (0.001 for mg/L)  
 P<sub>d</sub> Permeability coefficient (see table below)

Permeability coefficients	
Aluminum	1.00E-03 ( <a href="#">EPA Dermal Exposure Assessment</a> ; <a href="#">EPA RAGS part E Exhibit 3-1</a> )
Antimony	1.00E-03
Arsenic	1.00E-03
Barium	1.00E-03
Beryllium	1.00E-03
Cadmium	1.00E-03
Chromium VI	2.00E-03
Cobalt	4.00E-04 ( <a href="#">EPA RAGS part E Exhibit 3-1</a> )
Copper	1.00E-03
Iron	N/A
Lead	4.00E-06
Manganese	1.00E-03
Mercury	1.00E-03 ( <a href="#">EPA RAGS part E Exhibit 3-1</a> )
Molybdenum	1.00E-03 (Table 8 from a <a href="#">contractor-derived HHRA for CalDOT</a> ; <a href="#">EPA RAGS part E Exhibit 3-1</a> )
Nickel	2.00E-04
Selenium	1.00E-03
Silver	6.00E-04
Thallium	1.00E-03
Vanadium	1.00E-03
Zinc	6.00E-04

# Recreational Water Screening Values - Total Metals

Recreational Water (Total Metals)				Above Screening Level																				
No Exceedence		Above Screening Level																						
				Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	
Recreational Screening Values				620,767	248	186	124,159	1,242	62	410	7,931	6,208	851,582	910	31,040	1,242	3,104	17,480	3,104	3,630	25	6,208	217,786	
Monitoring Location	Site Description	Collection Date	Collection Time	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	
4954000	San Juan R @ US160 Xing in CO	2/16/2016	3:00 PM	70,180	ND	10.3	890.0	5.1	ND	37.1	31.6	82.6	51,500	56.7	1,426.9	ND	ND	40.4	16.5	ND	ND	70.8	202.0	
		2/23/2016	10:10 AM	2,475	ND	1.5	226.6	2.1	0.4	4.5	ND	16.3	1,250	9.8	921.6	ND	ND	7.5	ND	ND	ND	ND	58.1	
		2/29/2016	4:00 PM	3,282	ND	1.8	120.1	ND	0.1	6.2	ND	6.0	3,312	4.3	129.0	ND	1.1	ND	ND	ND	ND	ND	23.4	
		3/9/2016	8:20 AM	2,887	ND	2.0	106.0	ND	0.1	5.8	ND	6.0	2,970	4.8	144.1	ND	ND	ND	ND	ND	ND	ND	ND	28.8
		3/15/2016		1,544	ND	ND	ND	ND	ND	4.3	ND	4.7	1,640	3.2	101.3	ND	1.1	ND	ND	ND	ND	ND	ND	18.3
		3/22/2016	9:30 AM	528	ND	1.7	ND	ND	ND	5.0	ND	3.6	659	2.3	64.0	ND	ND	ND	ND	ND	ND	ND	ND	ND
		3/28/2016	4:50 PM	256	ND	9.8	ND	ND	ND	8.0	ND	2.3	356	1.3	41.9	ND	ND	ND	ND	ND	ND	ND	ND	ND
		4/4/2016	12:20 PM	1,408	ND	7.8	ND	ND	ND	7.8	ND	3.7	1,320	1.9	47.4	ND	1.3	ND	ND	ND	ND	ND	ND	10.4
		4/12/2016	2:00 PM	674	ND	1.5	100.9	ND	0.3	ND	ND	10.5	1,310	9.2	283.1	ND	ND	ND	ND	ND	ND	ND	ND	63.0
		4/19/2016	12:25 PM	2,047	ND	1.2	123.9	ND	0.2	ND	ND	9.7	7,060	9.5	244.9	ND	ND	ND	ND	ND	ND	ND	ND	49.5
		4/26/2016	11:45 AM	3,183	ND	1.9	110.4	ND	0.2	2.7	ND	9.8	4,100	7.8	169.0	ND	ND	ND	ND	ND	ND	ND	ND	42.8
5/2/2016	2:00 PM	6,177	ND	2.4	162.9	ND	0.3	3.8	ND	9.9	6,260	10.1	263.3	ND	ND	5.4	ND	ND	ND	ND	ND	55.5		
4953880	McElmo Creek at U262 xing near Town of Montezuma Creek	2/23/2016	5:35 PM	1,124	ND	1.3	ND	ND	0.3	4.7	ND	5.4	1,680	4.8	313.5	ND	1.3	6.6	1.2	ND	ND	ND	10.5	
		2/29/2016	5:00 PM	2,249	ND	ND	ND	ND	ND	5.3	ND	3.0	2,050	2.2	105.4	ND	2.6	5.1	1.3	ND	ND	ND	ND	
		3/9/2016	9:05 AM	385	ND	9.9	ND	ND	ND	5.6	ND	1.9	359	0.4	33.6	ND	2.7	ND	ND	ND	ND	ND	20.2	
		3/15/2016	9:20 AM	4,814	ND	2.2	ND	ND	0.2	7.4	ND	6.9	5,700	4.9	182.9	ND	3.4	9.0	1.5	ND	0.1	ND	20.4	
		3/22/2016	10:30 AM	715	ND	7.3	ND	ND	0.2	6.1	ND	3.3	1,300	3.1	165.1	ND	1.6	6.3	1.1	ND	ND	ND	ND	
		3/28/2016	5:40 PM	103	ND	10.9	ND	ND	ND	9.4	ND	1.7	179	0.4	55.0	ND	3.3	ND	ND	ND	ND	ND	ND	
		4/4/2016	1:30 PM	65	ND	11.4	ND	ND	ND	7.6	ND	1.5	117	0.3	54.4	ND	3.8	ND	1.3	ND	ND	ND	ND	
		4/12/2016		29	ND	ND	ND	ND	ND	ND	1.1	54	0.1	51.9	ND	5.0	ND	1.1	ND	ND	ND	ND		
		4/19/2016	11:40 AM	116	ND	ND	ND	ND	ND	ND	1.5	144	0.6	77.4	ND	4.4	5.1	1.9	ND	ND	ND	ND	ND	
		4/26/2016	11:00 AM	16	ND	ND	ND	ND	ND	ND	ND	ND	38	0.1	69.9	ND	5.6	ND	1.4	ND	ND	ND	ND	
5/2/2016	1:30 PM	322	ND	1.2	ND	ND	ND	ND	ND	1.3	349	0.3	60.0	ND	3.9	ND	ND	ND	ND	ND	ND			
4953990	San Juan R @ Town of Montezuma	2/16/2016	4:15 PM	81,859	ND	12.7	929.0	5.9	ND	39.7	34.1	92.9	60,100	67.4	1,628.7	ND	ND	43.8	33.0	ND	ND	80.2	222.9	
		2/23/2016	6:00 PM	1,703	ND	1.8	136.2	1.1	0.3	3.4	ND	13.0	1,490	9.1	496.2	ND	ND	5.3	1.3	ND	ND	ND	36.4	
		2/29/2016	5:30 PM	3,441	ND	1.6	123.0	ND	0.1	5.7	ND	6.1	3,360	4.5	142.5	ND	1.1	ND	1.1	ND	ND	ND	22.7	
		3/9/2016	10:00 AM	3,198	ND	2.5	115.4	ND	0.1	6.2	ND	5.7	3,300	4.6	133.9	ND	1.0	ND	ND	ND	ND	ND	24.1	
		3/15/2016		2,224	ND	ND	102.7	ND	ND	5.0	ND	5.3	2,310	3.3	99.5	ND	1.5	ND	ND	ND	ND	ND	15.9	
		3/22/2016	10:55 AM	429	ND	1.6	ND	ND	ND	6.2	ND	3.1	590	2.2	82.4	ND	ND	ND	ND	ND	ND	ND	ND	
		3/28/2016	3:45 PM	211	ND	10.1	ND	ND	ND	8.5	ND	3.3	315	1.5	41.0	ND	ND	ND	ND	ND	ND	ND	ND	
		4/4/2016	2:00 PM	1,424	ND	ND	ND	ND	ND	7.6	ND	3.5	1,040	1.6	40.2	ND	1.4	ND	ND	ND	ND	ND	ND	
		4/12/2016	1:00 PM	692	ND	1.3	ND	ND	0.3	ND	ND	10.7	1,410	9.3	275.2	ND	ND	ND	ND	ND	ND	ND	60.2	
		4/19/2016	11:10 AM	1,692	ND	1.9	148.4	ND	0.4	ND	ND	11.6	5,520	11.7	403.3	ND	ND	ND	1.2	ND	ND	ND	63.8	
		4/26/2016	10:30 AM	4,534	ND	2.4	160.9	ND	0.2	4.0	ND	11.6	5,790	8.9	210.8	ND	1.2	7.0	ND	ND	ND	ND	45.3	
5/2/2016	1:00 PM	3,269	ND	1.8	138.9	ND	0.1	2.3	ND	6.8	3,730	5.8	154.3	ND	1.1	ND	ND	ND	ND	ND	29.4			
4953560	Montezuma Creek at U163 xing	2/23/2016	6:30 PM	1,823	ND	3.4	149.8	ND	ND	3.7	ND	5.3	843	3.6	198.6	ND	1.7	ND	3.1	ND	ND	ND	ND	
		2/29/2016	5:40 PM	1,078	ND	3.1	173.3	ND	ND	4.3	ND	4.0	561	1.0	34.2	ND	3.8	ND	3.5	ND	ND	ND	ND	
		3/9/2016	9:40 AM	1,459	ND	2.1	126.4	ND	ND	5.4	ND	3.3	682	0.7	28.3	ND	4.4	ND	2.5	ND	ND	ND	ND	
		3/15/2016	10:20 AM	77	ND	2.2	123.9	ND	ND	4.1	ND	2.8	51	ND	62.7	ND	6.0	ND	1.2	ND	ND	ND	ND	

# Recreational Water Screening Values - Total Metals

Recreational Water (Total Metals)				Recreational Screening Values																					
No Exceedence		Above Screening Level		Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc		
Monitoring Location	Site Description	Collection Date	Collection Time	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L		
4953250	San Juan R @ Sand Island	2/16/2016	5:00 PM	68,001	ND	12.0	952.0	5.5	ND	36.0	30.0	78.5	51,600	59.0	1,478.9	ND	ND	39.5	22.2	ND	ND	68.9	197.7		
		2/24/2016	8:40 AM	1,580	ND	1.7	150.9	1.2	0.3	4.0	ND	11.7	1,140	7.6	591.5	ND	ND	5.5	ND	ND	ND	ND	ND	33.1	
		3/1/2016	8:15 AM	3,321	ND	1.2	122.5	ND	0.1	4.3	ND	6.6	3,080	5.1	198.8	ND	1.0	ND	ND	ND	ND	ND	ND	25.5	
		3/9/2016	12:10 PM	3,731	ND	7.1	158.7	ND	0.2	8.2	ND	7.7	3,920	6.4	196.4	ND	1.2	ND	ND	ND	ND	ND	ND	30.7	
		3/15/2016	11:00 AM	1,900	ND	1.8	ND	ND	ND	5.2	ND	4.5	1,950	2.8	77.0	ND	1.4	ND	ND	ND	ND	ND	ND	12.1	
		3/22/2016	11:40 AM	545	ND	1.1	ND	ND	ND	5.5	ND	3.3	679	2.3	87.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		3/29/2016	9:50 AM	1,975	ND	1.0	ND	ND	ND	8.1	ND	3.2	1,610	1.9	55.3	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND
		4/4/2016	2:40 PM	295	ND	ND	ND	ND	ND	ND	ND	2.9	338	1.9	73.4	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND
		4/12/2016	10:30 AM	777	ND	1.7	105.7	ND	0.4	ND	ND	12.3	1,490	10.1	371.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	69.0
		4/19/2016	10:17 AM	1,003	ND	1.2	116.4	ND	0.3	ND	ND	9.8	5,820	9.7	266.1	ND	ND	ND	ND	ND	ND	0.1	ND	53.9	
4/26/2016	10:00 AM	735	ND	1.4	ND	ND	0.2	ND	ND	6.4	1,210	5.2	151.5	ND	ND	ND	ND	ND	ND	ND	ND	23.2			
5/2/2016	12:00 PM	2,069	ND	1.6	110.0	ND	ND	ND	ND	5.1	2,660	4.0	97.2	ND	1.1	ND	ND	ND	ND	ND	ND	21.5			
4953000	San Juan R @ Mexican Hat US163 Xing	2/17/2016	9:00 AM	70,228	ND	12.8	845.0	ND	ND	34.2	ND	79.3	51,300	59.9	1,514.5	ND	ND	38.7	25.9	ND	ND	72.8	194.2		
		2/24/2016	9:20 AM	2,268	ND	1.5	160.0	1.3	0.3	3.9	ND	13.6	1,360	10.8	637.0	ND	ND	5.1	ND	ND	ND	ND	ND	33.4	
		3/1/2016	9:00 AM	3,766	ND	1.4	130.4	ND	0.1	4.8	ND	7.4	3,360	5.0	194.1	ND	1.1	ND	ND	ND	ND	ND	ND	23.4	
			9:10 AM	2,078	ND	1.1	104.1	ND	0.1	3.7	ND	6.5	2,030	4.0	142.0	ND	ND	ND	ND	ND	ND	ND	ND	18.6	
		3/9/2016	11:30 AM	4,030	ND	10.3	140.2	ND	0.2	8.2	ND	7.6	4,170	6.4	228.1	ND	1.1	ND	ND	ND	ND	ND	ND	31.6	
		3/15/2016	11:45 AM	2,385	ND	ND	105.8	ND	ND	5.6	ND	5.4	2,330	3.1	87.1	ND	1.5	ND	ND	ND	0.2	ND	15.2		
		3/22/2016	12:25 PM	1,759	ND	1.5	111.2	ND	ND	6.2	ND	4.2	1,850	2.7	78.9	ND	1.2	ND	ND	ND	ND	ND	ND	ND	
		3/29/2016	8:55 AM	501	ND	4.4	ND	ND	ND	8.3	ND	2.1	482	0.9	27.2	ND	1.2	ND	ND	ND	ND	ND	ND	ND	
		4/4/2016	3:30 PM	193	ND	ND	ND	ND	ND	ND	ND	2.2	133	1.2	43.5	ND	1.3	ND	ND	ND	ND	ND	ND	ND	
		4/12/2016	11:15 AM	845	ND	1.5	102.2	ND	0.4	ND	ND	11.2	1,430	9.4	360.9	ND	ND	ND	ND	ND	ND	ND	ND	58.9	
4/19/2016	9:33 AM	2,755	ND	3.0	262.4	ND	0.4	ND	ND	7.6	17,100	11.3	706.9	ND	ND	ND	ND	ND	0.1	ND	48.4				
4/26/2016	8:30 AM	5,230	ND	2.6	169.4	ND	0.2	4.3	ND	10.5	6,010	8.1	202.9	ND	1.2	5.9	1.0	ND	ND	ND	36.1				
5/2/2016	11:00 AM	2,601	ND	1.8	131.3	ND	0.1	ND	ND	5.8	2,760	4.4	120.6	ND	1.0	ND	ND	ND	ND	ND	21.9				
4952942	San Juan R @ Clay Hills	2/17/2016	10:30 AM	47,903	ND	10.0	628.0	ND	ND	23.6	ND	53.2	35,100	40.7	954.4	ND	ND	24.9	13.9	ND	ND	53.7	129.6		

## **Agricultural Screening Values – Dissolved Metals**

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### ***Comparison of San Juan River Raw Water Data with Screening Values for Agricultural Uses (Stock watering and Irrigation) – Dissolved Metals***

The dissolved water concentrations of metals and metalloids were compared to screening values, including Utah's water quality standards for the Class 4 protected for agricultural uses including irrigation of crops and stock watering. Results are below the screening values for metals and metalloids. The Utah agricultural water quality standard for total dissolved solids was exceeded on all sampling dates at the McElmo Creek and Montezuma Creek tributary sites. UDAF has analyzed the data and compared to current toxicology knowledge and scientific data concerning animal and plant life safety. DAF found no long term exposure potential risks from use of the water for livestock, wildlife, or crop irrigation.



# Agricultural Screening Values – Dissolved Metals

Agricultural Water (Dissolved Metals)																												
No Exceedence				Above Screening Level																								
				Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	1,000,000	TDS @ 180 C	Thallium	Vanadium	Zinc	
Livestock Water Screening Value				5,000		200			50	500	1,000	1,000	500		100	250,000		10			50		1,000,000	1,200		100	25,000	
Irrigation Water Short-Term				20,000		2,000			50	1,000	5,000	5,000	20,000	10,000		10,000			50	2,000	20					1,000	10,000	
Irrigation Water Long-Term				5,000		100			10	100	50	200	5,000	5,000		5,000			10	200	20				500,000		100	2,000
Utah DWQ Agricultural Use Criteria						100			10		100		200		100						50				1,200			
Monitoring Location	Site Description	Collection Date	Collection Time	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	ug/L	ug/L	ug/L	
4954000	San Juan R @ US160 xing in CO	2/16/2016	3:00 PM	319.3	ND	ND	186.9	ND	ND	66.2	ND	ND	6.0	155.0	0.5	10.9	14.4	ND	1.5	ND	1.6	ND	62.9	490	ND	ND	22.5	
		2/23/2016	10:10 AM	14.9	ND	ND	ND	ND	ND	67.9	ND	ND	1.8	ND	ND	12.5	ND	ND	1.4	ND	1.2	ND	44.8	394	ND	ND	ND	
		2/29/2016	4:00 PM	10.4	ND	ND	ND	ND	ND	71.1	ND	ND	1.7	ND	ND	13.7	ND	ND	1.2	ND	1.1	ND	39.2	386	ND	ND	ND	
		3/9/2016	8:20 AM	17.3	ND	ND	ND	ND	ND	64.9	ND	ND	1.0	ND	ND	12.0	ND	ND	1.2	ND	ND	ND	34.2	358	ND	ND	ND	
		3/15/2016		ND	ND	ND	ND	ND	ND	71.9	ND	ND	ND	ND	ND	13.4	ND	ND	1.3	ND	ND	ND	37.0	376	ND	ND	ND	
		3/22/2016	9:30 AM	ND	ND	ND	ND	ND	ND	67.4	ND	ND	ND	ND	ND	13.1	ND	ND	1.2	ND	ND	ND	35.6	382	ND	ND	ND	
		3/26/2016	4:50 PM	ND	ND	ND	ND	ND	ND	70.8	ND	ND	ND	ND	ND	12.6	ND	ND	1.2	ND	ND	ND	38.1	360	ND	ND	ND	
		4/4/2016	12:20 PM	52.3	ND	ND	ND	ND	ND	74.1	ND	ND	2.4	36.2	0.1	13.7	5.3	ND	1.4	ND	ND	ND	42.5	392	ND	ND	ND	
		4/12/2016	2:00 PM	31.0	ND	ND	ND	ND	ND	59.8	ND	ND	1.1	ND	ND	10.7	ND	ND	1.3	ND	ND	ND	28.0	294	ND	ND	ND	
		4/19/2016	12:25 PM	18.5	ND	ND	ND	ND	ND	66.6	ND	ND	1.1	ND	ND	12.8	ND	ND	1.2	ND	ND	ND	41.3	378	ND	ND	ND	
		4/26/2016	11:45 AM	29.3	ND	ND	ND	ND	ND	67.4	ND	ND	1.3	ND	ND	12.0	ND	ND	1.4	ND	ND	ND	31.1	332	ND	ND	ND	
5/2/2016	2:00 PM	24.5	ND	ND	ND	ND	ND	69.8	ND	ND	1.2	ND	ND	12.2	5.9	ND	1.1	ND	ND	ND	37.3	348	ND	ND	ND			
4953880	McElmo Creek at U262 xing near Town of Montezuma Creek	2/23/2016	5:35 PM	ND	ND	1.1	ND	ND	213.7	ND	ND	1.6	ND	ND	114.8	12.7	ND	3.0	ND	2.0	ND	118.6	1,718	ND	ND	ND		
		2/29/2016	5:00 PM	69.6	ND	ND	ND	ND	244.0	ND	ND	2.1	24.7	ND	142.0	20.1	ND	3.2	ND	2.5	ND	146.0	2,042	ND	ND	ND		
		3/9/2016	9:05 AM	ND	ND	ND	ND	ND	254.0	ND	ND	1.2	ND	ND	156.0	18.6	ND	3.0	ND	2.0	ND	167.0	2,180	ND	ND	ND		
		3/15/2016	9:20 AM	ND	ND	ND	ND	ND	229.0	ND	ND	ND	ND	ND	115.0	8.6	ND	3.1	ND	ND	ND	112.0	1,698	ND	ND	ND		
		3/22/2016	10:30 AM	ND	ND	ND	ND	ND	231.0	ND	ND	ND	ND	ND	118.0	9.7	ND	3.3	ND	1.2	ND	118.0	1,754	ND	ND	ND		
		3/28/2016	5:40 PM	ND	ND	ND	ND	ND	265.0	ND	ND	ND	ND	ND	159.0	27.5	ND	3.7	ND	ND	ND	170.0	2,154	ND	ND	ND		
		4/4/2016	1:30 PM	ND	ND	ND	ND	ND	239.0	ND	ND	ND	ND	ND	146.0	25.7	ND	3.8	ND	ND	ND	163.0	2,014	ND	ND	ND		
		4/12/2016	11:40 AM	ND	ND	ND	ND	ND	213.0	ND	ND	ND	ND	ND	141.0	46.7	ND	5.4	ND	1.7	ND	171.0	2,262	ND	ND	ND		
		4/19/2016		ND	ND	ND	ND	ND	272.0	ND	ND	1.5	ND	0.1	181.0	43.3	ND	4.6	ND	2.3	ND	217.0	2,562	ND	ND	ND		
		4/26/2016	11:00 AM	ND	ND	ND	ND	ND	248.0	ND	ND	1.2	ND	ND	176.0	69.1	ND	5.5	ND	ND	ND	225.0	2,340	ND	ND	ND		
5/2/2016	1:30 PM	ND	ND	ND	ND	ND	206.0	ND	ND	ND	ND	ND	139.0	14.1	ND	3.9	ND	1.1	ND	158.0	1,746	ND	ND	ND				
4953990	San Juan R @ Town of Montezuma	2/16/2016	4:15 PM	231.2	ND	ND	161.7	ND	76.6	ND	ND	3.5	109.0	0.3	18.3	8.8	ND	1.7	ND	1.4	ND	72.7	574	ND	ND	18.1		
		2/23/2016	6:00 PM	18.5	3.5	ND	ND	ND	81.4	ND	ND	1.7	ND	0.2	21.3	ND	ND	1.8	ND	1.6	ND	52.5	508	ND	ND	ND		
		2/29/2016	5:30 PM	22.4	ND	ND	ND	ND	80.2	ND	ND	1.4	ND	ND	20.3	ND	ND	1.4	ND	ND	ND	46.4	488	ND	ND	ND		
		3/9/2016	10:00 AM	34.3	ND	ND	ND	ND	73.9	ND	ND	ND	ND	ND	17.9	ND	ND	1.3	ND	ND	ND	40.1	438	ND	ND	ND		
		3/15/2016		ND	ND	ND	ND	ND	81.2	ND	ND	ND	ND	ND	19.7	ND	ND	1.4	ND	ND	ND	42.0	452	ND	ND	ND		
		3/22/2016	10:55 AM	ND	ND	ND	ND	ND	78.4	ND	ND	ND	ND	ND	18.8	ND	ND	1.4	ND	ND	ND	41.6	454	ND	ND	ND		
		3/28/2016	3:45 PM	ND	ND	ND	ND	ND	75.8	ND	ND	1.0	ND	ND	16.9	ND	ND	1.3	ND	ND	ND	40.6	410	ND	ND	ND		
		4/4/2016	2:00 PM	ND	ND	ND	ND	ND	80.1	ND	ND	1.1	ND	ND	18.0	ND	ND	1.5	ND	ND	ND	47.5	452	ND	ND	ND		
		4/12/2016	1:00 PM	26.2	ND	ND	ND	ND	62.9	ND	ND	1.2	ND	ND	12.4	ND	ND	1.3	ND	ND	ND	30.6	322	ND	ND	ND		
		4/19/2016	11:10 AM	50.9	ND	ND	ND	ND	69.1	ND	ND	1.5	29.7	ND	15.7	8.2	ND	1.3	ND	1.4	ND	39.2	404	ND	ND	ND		
		4/26/2016	10:30 AM	18.1	ND	ND	ND	ND	71.8	ND	ND	1.2	ND	ND	14.4	ND	ND	1.3	ND	ND	ND	37.0	366	ND	ND	ND		
5/2/2016	1:00 PM	16.7	ND	ND	ND	ND	73.4	ND	ND	1.1	ND	ND	15.8	ND	ND	1.1	ND	ND	ND	38.1	388	ND	ND	ND				
4953560	Montezuma Creek at U163 xing	2/23/2016	6:30 PM	ND	ND	2.9	106.3	ND	157.0	ND	ND	2.9	ND	ND	98.9	ND	ND	3.6	ND	3.6	ND	217.0	1,648	ND	ND	ND		
		2/29/2016	5:40 PM	ND	ND	3.1	242.1	ND	164.0	ND	ND	3.9	ND	ND	116.0	6.3	ND	4.8	ND	4.1	ND	366.0	2,146	ND	ND	ND		
		3/9/2016	9:40 AM	12.2	ND	2.5	125.7	ND	134.0	ND	ND	2.8	ND	ND	84.7	9.9	ND	5.4	ND	3.5	ND	370.0	1,940	ND	ND	ND		
		3/15/2016	10:20 AM	ND	ND	2.4	127.5	ND	139.0	ND	ND	1.9	ND	ND	78.5	58.6	ND	5.9	ND	ND	ND	512.7	2,232	ND	ND	ND		

# Agricultural Screening Values – Dissolved Metals

Agricultural Water (Dissolved Metals)																											
No Exceedence			Above Screening Level																								
			Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	1,000,000	TDS @ 180 C	Thallium	Vanadium	Zinc	
Livestock Water Screening Value			5,000		200			50	500	1,000	1,000	500		100	250,000		10			50		1,000,000	1,200		100	25,000	
Irrigation Water Short-Term			20,000		2,000			50		1,000	5,000	5,000	20,000	10,000		10,000		50	2,000	20					1,000	10,000	
Irrigation Water Long-Term			5,000		100			10		100	50	200	5,000	5,000		200		10	200	20			500,000		100	2,000	
Utah DWQ Agricultural Use Criteria					100			10		100		200		100						50			1,200				
Monitoring Location	Site Description	Collection Date	Collection Time	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	mg/L	ug/L	ug/L	ug/L	
4953250	San Juan R @ Sand Island	2/16/2016	5:00 PM	128.5	ND	1.0	104.8	ND	77.7	ND	ND	2.7	71.7	0.2	18.8	ND	ND	1.7	ND	1.5	ND	70.7	570	ND	ND	ND	
		2/24/2016	8:40 AM	34.8	ND	ND	ND	ND	83.0	5.4	ND	2.0	57.2	0.2	23.3	6.9	ND	1.6	ND	1.3	ND	53.4	526	ND	ND	ND	
		3/1/2016	8:15 AM	60.1	ND	ND	ND	ND	80.0	ND	ND	1.3	44.2	ND	20.7	ND	ND	1.4	ND	1.3	ND	47.0	476	ND	ND	ND	
		3/9/2016	12:10 PM	10.0	ND	ND	ND	ND	73.1	ND	ND	1.0	ND	ND	17.9	ND	ND	1.3	ND	ND	ND	40.6	434	ND	ND	ND	
		3/15/2016	11:00 AM	ND	ND	ND	ND	ND	82.9	ND	ND	ND	ND	ND	20.3	ND	ND	1.5	ND	ND	ND	48.6	466	ND	ND	ND	
		3/22/2016	11:40 AM	10.1	ND	ND	ND	ND	79.6	ND	ND	ND	ND	ND	ND	19.3	ND	ND	1.4	ND	ND	ND	43.1	466	ND	ND	ND
		3/29/2016	9:50 AM	16.1	ND	ND	ND	ND	76.8	ND	ND	ND	ND	ND	ND	17.7	ND	ND	1.4	ND	ND	ND	41.8	416	ND	ND	ND
		4/4/2016	2:40 PM	14.6	ND	ND	ND	ND	79.3	ND	ND	ND	1.0	ND	ND	18.7	ND	ND	1.5	ND	ND	ND	50.1	456	ND	ND	ND
		4/12/2016	10:30 AM	18.2	ND	ND	ND	ND	62.0	ND	ND	1.2	ND	ND	ND	12.5	ND	ND	1.4	ND	ND	ND	31.3	324	ND	ND	ND
		4/19/2016	10:17 AM	16.0	ND	ND	ND	ND	67.9	ND	ND	1.3	ND	ND	ND	14.5	ND	ND	1.2	ND	ND	ND	37.4	368	ND	ND	ND
		4/26/2016	10:00 AM	12.7	ND	ND	ND	ND	74.4	ND	ND	1.2	ND	ND	ND	15.2	ND	ND	1.4	ND	ND	ND	40.8	414	ND	ND	ND
		5/2/2016	12:00 PM	15.9	ND	ND	ND	ND	73.1	ND	ND	1.2	ND	ND	ND	15.2	ND	ND	1.2	ND	ND	ND	38.6	392	ND	ND	ND
4953000	San Juan R @ Mexican Hat US163 Xing	2/17/2016	9:00 AM	57.7	ND	1.0	ND	ND	77.2	ND	ND	2.0	37.2	0.1	18.7	ND	ND	1.7	ND	1.6	ND	69.5	582	ND	ND	ND	
		2/24/2016	9:20 AM	ND	ND	ND	ND	ND	85.1	ND	ND	1.3	ND	ND	22.9	ND	ND	1.6	ND	1.3	ND	54.7	530	ND	ND	ND	
		3/1/2016	9:00 AM	21.6	ND	1.1	ND	ND	80.7	ND	ND	1.4	ND	ND	20.5	ND	ND	1.6	ND	1.3	ND	46.6	486	ND	ND	ND	
		3/1/2016	9:10 AM	16.9	ND	1.0	ND	ND	80.2	ND	ND	2.0	ND	ND	20.6	ND	ND	1.4	ND	1.0	ND	47.5	476	ND	ND	11.3	
		3/9/2016	11:30 AM	17.7	ND	ND	ND	ND	73.1	ND	ND	1.6	ND	ND	17.7	ND	ND	1.4	ND	ND	ND	40.4	430	ND	ND	ND	
		3/15/2016	11:45 AM	ND	ND	ND	ND	ND	87.9	ND	ND	ND	ND	ND	21.8	ND	ND	1.5	ND	ND	ND	66.0	458	ND	ND	ND	
		3/22/2016	12:25 PM	10.4	ND	ND	ND	ND	82.1	ND	ND	ND	ND	ND	19.9	ND	ND	1.5	ND	ND	ND	44.5	470	ND	ND	ND	
		3/29/2016	8:55 AM	16.8	ND	ND	ND	ND	75.0	ND	ND	1.0	ND	ND	17.4	ND	ND	1.4	ND	ND	ND	40.7	414	ND	ND	ND	
		4/4/2016	3:30 PM	ND	ND	ND	ND	ND	80.0	ND	ND	1.1	ND	ND	18.9	ND	ND	1.5	ND	ND	ND	49.4	476	ND	ND	ND	
		4/12/2016	11:15 AM	19.0	ND	ND	ND	ND	64.2	ND	ND	1.1	ND	ND	13.2	ND	ND	1.5	ND	ND	ND	33.4	340	ND	ND	ND	
		4/19/2016	9:33 AM	150.4	ND	ND	119.8	ND	65.4	ND	ND	1.3	83.5	ND	14.3	ND	ND	1.3	ND	ND	ND	39.2	368	ND	ND	ND	
		4/26/2016	8:30 AM	ND	ND	ND	ND	ND	75.7	ND	ND	1.6	ND	ND	16.2	ND	ND	1.7	ND	ND	ND	43.7	416	ND	ND	ND	
5/2/2016	11:00 AM	16.3	ND	ND	ND	ND	71.3	ND	ND	1.2	ND	ND	14.4	ND	ND	1.1	ND	ND	ND	37.5	380	ND	ND	ND			
4952942	San Juan R @ Clay Hills	2/17/2016	10:30 AM	162.9	ND	1.1	112.5	ND	79.1	ND	ND	2.3	77.5	0.2	21.0	5.5	ND	1.7	ND	1.7	ND	67.5	568	ND	ND	11.9	