



UTAH DEPARTMENT of
ENVIRONMENTAL QUALITY
**WATER
QUALITY**

Evaluation of UDEQ Water Quality Data Collected in Response to the Gold King Mine Release

Data Collected: August 8, 2015 – October 26, 2015

Prepared and Reviewed by:

Utah Department of Environmental Quality, Division of Water Quality

Utah Department of Environmental Quality, Division of Drinking Water

Utah Department of Health, Environmental Epidemiology Program

Utah Department of Natural Resources, Division of Wildlife Resources

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Introduction

DEQ collected water samples at five different locations on the San Juan River. Water samples were collected intensively during the first three weeks of August, 2015 after the Gold King Mine release. Because the acute effects of the release had passed, DEQ moved in September and October to a less intensive monitoring regime. In October, DEQ's contractor deployed sampling equipment to collect rivers samples during storm events. These samples indicate that the total metals concentration in the river were elevated during the monsoonal storms in late Fall 2015. However, none of the data exceed the recreational health screening values developed by the Utah Department of Health. Due to the episodic nature of storms, only total metals data could be collected through this sampling mechanism. DEQ also collected a full suite of metals, water column, and macroinvertebrate samples on September 22 and October 26. [Raw data files](#) are available on DEQ's Gold King Mine website.

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				San [Dissolved] Utah Drinking Water Standards (R309-200-5) [Total Metals]		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)	Maximum Contaminant Level	Action Level		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					6	248	No Data Available	No Data Available	No Data Available		Antimony
Arsenic	7440-38-2	µg/L	10	340	150	100	10	186	200 (NAS)	100	2,000		Arsenic
Barium	7440-39-3	µg/L	1000				2,000	124,159	No Data Available	No Data Available	No Data Available		Barium
Beryllium	7440-41-7	µg/L	<4				4	1,242	No Data Available	No Data Available	No Data Available		Beryllium
Cadmium	7440-43-9	µg/L	10	2	0.25	10	5	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	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		1300	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		15	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		2	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	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					2	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

Comparison of San Juan River 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. Only one sample collected at the Stateline site on August 28, 2015 exceeded the standard for lead.

		No Exceedence	Above Screening Level	Prior to Plume Arrival				Estimated Plume Arrival				Post Plume Arrival															
		Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc		
Utah Domestic Source Criteria				10	1,000	4	10		50				15			2				50	50						
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	mg/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L		
4954000	San Juan R @ US160 Xing in CO	8/8/2015	1:23:00 PM	217	0.524	1.34	222	0.04	ND	51.5	ND	0.13	2.24	95.8	ND	7.85	2.94	ND	1.87	ND	2.96	0.72	ND	32.2	ND	4.86	15.3
		8/9/2015	12:02:00 PM	258	0.341	0.63	274	ND	ND	50.6	ND	0.08	2.48	119	ND	6.86	2.69	ND	2.01	ND	2.61	0.56	0.0257	28.5	ND	1.76	18.5
		8/9/2015	9:02:00 PM	329	0.347	0.95	341	0.04	ND	46	ND	0.14	3.47	198	0.27	6.3	4.14	ND	1.94	ND	2.38	0.54	ND	30	ND	2.07	15.4
		8/10/2015	9:11:00 AM	172	0.458	0.99	233	ND	ND	44.6	ND	0.07	3.21	103	0.39	6.01	1.64	ND	2.03	ND	2.51	0.58	ND	34.1	ND	1.74	19.7
		8/10/2015	2:06:00 PM	1050	0.711	1.3	220	0.09	ND	44.2	ND	0.41	3.35	732	1.04	6.02	12.8	ND	1.92	0.838	2.72	0.65	0.0586	35.1	ND	3.64	18
		8/11/2015	8:50:00 AM	3290	0.364	1.72	451	0.1	ND	39.8	ND	0.49	4.85	1520	1.1	5.05	19	0.02	1.65	1.19	3	0.97	ND	43.7	ND	3.9	19.1
		8/11/2015	1:17:00 PM	720	0.0516	1.33	334	ND	ND	41.7	ND	0.16	3.03	366	0.27	5.11	5.1	ND	1.58	ND	2.91	0.76	ND	37	ND	2.46	14.9
		8/12/2015	9:50:00 AM	104	0.586	0.88	178	ND	ND	52.1	ND	0.06	2.39	ND	ND	7.2	ND	ND	1.47	ND	2.79	0.78	0.0252	30.3	ND	1.9	14.8
		8/12/2015	2:04:00 PM	155	0.548	1.21	151	ND	ND	47.9	ND	0.05	2.61	ND	ND	6.97	1.82	ND	1.48	ND	2.74	0.73	ND	27.3	ND	2.87	16.5
		8/13/2015	10:01:00 AM	257	0.158	1.25	213	0.03	ND	48.3	ND	0.12	3.67	148	0.37	6.48	3.16	ND	1.89	ND	2.87	0.86	ND	42.5	ND	2.1	21.9
		8/14/2015	2:33:00 PM	64.8	0.421	1.7	72	0.04	ND	53.4	ND	0.13	3.86	ND	ND	6.61	1.8	ND	3.65	3.14	3.66	1.1	ND	52.4	0.04	4.11	ND
		8/15/2015	12:04:00 PM	47.5	0.445	1.36	65	ND	ND	52.8	ND	0.05	1.35	ND	ND	7.91	ND	ND	2.25	ND	2.61	0.61	ND	25.9	ND	2.61	ND
		8/16/2015	9:15:00 AM	54.4	1.12	0.88	179	0.04	ND	53.9	ND	0.09	2.91	ND	ND	8.18	ND	ND	1.72	ND	2.54	0.6	0.186	26.1	ND	1.92	12.6
		8/18/2015	9:56:00 AM	23.9	0.689	1.31	148	ND	ND	57.5	ND	0.09	2.27	ND	0.29	9.82	ND	ND	1.74	ND	2.5	0.59	0.0393	33.4	ND	1.88	12.3
		8/19/2015	9:30:00 AM	ND	0.682	1.34	106	ND	ND	57.1	ND	0.07	1.7	ND	ND	9.98	ND	ND	1.72	ND	2.54	0.54	0.0291	34.1	ND	1.91	8.44
		8/20/2015	9:44:00 AM	28.4	0.764	1.32	132	ND	ND	57	ND	0.08	1.85	ND	ND	9.55	ND	ND	1.76	ND	2.44	0.63	0.104	33.8	0.04	1.93	8.1
		8/24/2015	3:10:00 PM	ND	0.273	1.36	62	ND	ND	50	ND	0.05	2.18	ND	ND	8.95	1.92	ND	1.56	1.08	2.64	0.54	ND	32.6	ND	2.31	5.49
		8/25/2015	3:30:00 PM	ND	0.481	1.42	63	ND	ND	47.8	ND	ND	2.11	ND	ND	8.74	1.88	ND	1.58	ND	2.52	0.58	ND	31.8	ND	2.52	ND
		8/26/2015	2:50:00 PM	760	0.563	1.47	71	0.06	ND	47.5	ND	0.31	2.75	554	0.46	8.82	21.8	ND	1.57	1.05	2.61	0.62	0.07	32.2	0.03	3.29	8
		8/27/2015	3:40:00 PM	798	0.335	1.01	121	0.06	ND	65.9	ND	0.38	3.3	605	0.53	10.2	11.4	ND	3.32	2.04	4.58	0.94	ND	49.2	ND	3.41	6.22
8/28/2015	4:25:00 PM	20700	0.249	5.55	340	1.58	0.26	59.4	12	9.01	27.7	16700	15.7	10	413	0.04	1.45	12.7	7.89	0.82	0.0852	89.6	0.18	26.2	72.8		
9/23/2015	6:30:00 PM	ND	0.724	0.99	82	0.11	ND	60.8	ND	0.25	1.88	ND	ND	10.9	9.31	ND	1.82	1.31	2.87	0.67	0.132	35	0.12	1.84	ND		
GK06	San Juan R @ McElmo Wash	9/23/2015	10:40:00 AM	28.8	0.402	1.1	61	ND	ND	165	ND	0.17	1.11	ND	ND	73.6	2.44	0.02	2.59	2.01	4.49	0.63	0.0256	65.4	ND	1.43	ND

Domestic Source Water Screening Values - Dissolved Metals

		No Exceedence	Above Screening Level	Prior to Plume Arrival				Estimated Plume Arrival				Post Plume Arrival															
Utah Domestic Source Criteria				Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	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	mg/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	mg/L	ug/L	ug/L	ug/L
4953990	San Juan R @ Town of Montezuma	8/8/2015	2:54:00 PM	136	0.747	1.06	223	0.04	ND	71.5	ND	0.13	2.72	ND	ND	9.92	ND	2.62	0.804	3.84	1.11	0.0412	43.5	ND	2.54	21	
		8/10/2015	10:13:00 AM	218	0.66	0.94	262	ND	ND	49.8	ND	0.08	3.24	144	0.46	7.7	3.22	ND	2.03	ND	2.69	0.57	0.0529	32.1	ND	2.13	17.3
		8/10/2015	2:58:00 PM	94.5	1.31	0.93	200	0.03	ND	48.6	ND	0.06	2.48	ND	0.3	7.35	ND	ND	2.32	ND	2.59	0.61	0.251	31.8	ND	1.96	14.6
		8/11/2015	9:44:00 AM	462	0.568	1.17	314	ND	ND	44.6	ND	0.13	2.66	227	ND	6.49	3.31	ND	1.72	ND	2.64	0.68	0.0307	37.1	ND	2.21	12.9
		8/11/2015	2:20:00 PM	1400	0.136	1.25	298	0.04	ND	44.8	ND	0.24	3.47	668	0.49	6.57	9.99	ND	1.72	0.952	2.96	0.74	ND	38.3	ND	2.73	14.3
		8/12/2015	10:37:00 AM	67.5	0.799	1.1	202	0.03	ND	48.3	ND	ND	2.49	ND	ND	7.23	ND	ND	1.66	ND	2.67	0.8	0.0397	31.9	ND	1.68	13.5
		8/12/2015	2:57:00 PM	375	0.822	0.91	176	ND	ND	48.9	ND	0.09	4.34	296	ND	7.5	2.28	ND	1.64	ND	2.84	0.72	0.0343	33.8	ND	1.99	15.9
		8/13/2015	4:46:00 PM	330	1.88	1.28	240	0.07	ND	49.4	ND	0.18	3.75	192	ND	8.08	5.3	ND	1.91	0.984	2.62	0.98	0.235	32.9	0.03	3.12	32.7
		8/14/2015	9:55:00 AM	24.8	0.582	1.27	85	0.04	ND	55.1	ND	0.15	3.79	ND	ND	7.81	ND	ND	2.84	1.76	3.51	0.99	0.0355	53	0.03	3.07	ND
		8/15/2015	11:31:00 AM	68.1	0.642	1.58	74	0.04	ND	55	ND	0.24	4.38	ND	ND	8.57	3.36	ND	2.43	1.09	3.16	0.89	0.0705	35.8	ND	3.54	ND
		8/16/2015	10:02:00 AM	61.8	0.835	1.17	145	0.06	ND	57.5	ND	0.09	3.01	ND	ND	9.36	ND	ND	1.99	ND	2.96	0.67	0.283	30.3	0.05	2.16	9.78
		8/17/2015	4:07:00 PM	27.3	0.285	1.17	80	ND	ND	60.2	ND	0.14	1.87	ND	ND	11.6	2.4	ND	1.97	ND	2.82	0.63	ND	29.4	ND	2.18	ND
		8/18/2015	8:41:00 AM	24.6	1.02	1.19	197	0.03	ND	62.7	ND	0.1	3.44	ND	0.32	12.7	ND	ND	2.07	ND	2.64	0.63	0.136	35.4	0.08	2.29	14.8
		8/19/2015	8:15:00 AM	ND	0.947	1.22	141	ND	ND	63.1	ND	0.08	1.67	ND	ND	13.7	ND	ND	1.99	ND	2.67	0.65	0.0967	37.7	0.03	2.3	9.64
		8/20/2015	8:59:00 AM	ND	0.994	1.4	128	ND	ND	62.7	ND	0.07	1.93	ND	ND	13.4	ND	ND	1.8	ND	2.62	0.66	ND	37.5	ND	2.14	6.64
		8/24/2015	4:30:00 PM	126	0.284	1.38	68	ND	ND	55.9	ND	0.1	2.31	ND	ND	12.8	4.86	ND	1.71	0.762	2.84	0.6	ND	38.4	ND	2.93	ND
		8/25/2015	4:20:00 PM	ND	0.278	1.26	68	ND	ND	55.9	ND	0.08	2.63	ND	ND	13.2	2.03	ND	1.8	0.934	2.71	0.59	ND	37.6	ND	2.71	10
		8/26/2015	3:30:00 PM	818	0.429	1.46	77	0.06	ND	57.6	ND	0.3	2.93	601	0.49	14.3	26.5	ND	1.76	1.13	2.96	0.64	ND	38.4	ND	3.76	5.37
		8/27/2015	2:50:00 PM	139	0.355	1.4	71	ND	ND	47.9	ND	0.19	2.06	ND	ND	10.4	3.95	ND	2.09	ND	2.76	0.71	ND	36.6	ND	2.67	ND
8/28/2015	3:35:00 PM	487	0.321	1.09	161	0.04	ND	95	ND	0.32	4.04	414	0.37	11.4	11.5	ND	2.67	1.62	6.46	0.79	ND	60.3	ND	2.78	191		
9/22/2015	5:30:00 PM	ND	0.265	1.3	75	ND	ND	70.3	ND	0.1	3.28	ND	ND	17.4	1.73	ND	1.75	1.42	2.92	0.57	ND	41.4	ND	2.83	5.88		
10/26/2015	2:00:00 PM	ND	0.946	1.03	109	ND	ND	74.9	ND	0.56	1.3	ND	ND	15.2	2.03	ND	1.8	0.756	3.25	0.6	ND	41	ND	1.86	ND		
4953250	San Juan R @ Sand Island	8/8/2015	4:19:00 PM	214	1.38	1.03	294	0.06	ND	73.7	ND	0.12	3.86	104	ND	9.24	2.55	ND	3.3	1.01	4.11	1.43	0.123	51.2	ND	2.22	19
		8/10/2015	11:15:00 AM	124	1.24	0.88	192	ND	ND	53.2	ND	0.07	2.07	ND	0.29	8.4	ND	ND	2.38	ND	2.86	0.69	0.252	28.4	ND	1.75	13.7
		8/10/2015	3:58:00 PM	108	0.574	1.07	184	ND	ND	48.4	ND	0.06	1.96	ND	0.32	7.83	ND	ND	2.26	ND	2.67	0.53	ND	30.6	ND	1.89	13.2
		8/11/2015	10:53:00 AM	684	1.18	1.23	278	0.06	ND	45.8	ND	0.17	2.87	328	ND	6.93	4.12	ND	1.92	0.778	2.72	0.69	0.269	36.8	0.03	2.55	13.7
		8/11/2015	3:01:00 PM	158	0.271	1.01	251	ND	ND	45.3	ND	0.09	2.69	89.2	ND	6.65	ND	ND	1.85	ND	2.76	0.67	ND	36.6	ND	2.05	14.9
		8/12/2015	11:12:00 AM	623	1.08	1.41	205	0.05	ND	46.8	ND	0.15	3.44	310	ND	6.98	4.47	ND	1.93	ND	2.91	0.79	0.0594	37.8	ND	2.61	14.5
		8/12/2015	5:06:00 PM	605	1.78	1.43	260	0.06	ND	46.6	ND	0.16	2.98	314	ND	7.07	5.16	ND	1.81	0.913	2.79	0.78	0.152	33.5	ND	2.32	13.2
		8/13/2015	11:28:00 AM	509	0.667	1.3	156	0.03	ND	53.6	ND	0.21	3.1	275	ND	8.21	8.9	ND	1.62	ND	2.96	0.68	ND	29.2	ND	3.65	20.4
		8/14/2015	11:02:00 AM	ND	1.03	2.03	79	0.05	ND	53.2	ND	0.13	3.31	ND	ND	8.26	7.02	ND	5.31	2.38	3.27	1.08	0.193	49.5	0.13	5.88	4.87
		8/15/2015	10:30:00 AM	95.2	1.12	1.84	84	0.04	ND	55.7	ND	0.09	2.27	ND	ND	8.4	ND	ND	3.93	0.816	3.46	1.06	0.276	46.7	0.05	3.45	ND
		8/16/2015	11:06:00 AM	290	0.425	1.23	149	0.04	ND	55.8	ND	0.15	3.89	202	ND	10.2	3.94	ND	1.95	ND	2.91	0.71	0.0426	36.3	ND	2.04	10.5
		8/17/2015	3:33:00 PM	ND	0.408	1.48	87	ND	ND	62.4	ND	0.17	2.11	ND	ND	11.2	ND	ND	2.67	1.28	3.13	0.63	ND	30	ND	2.75	ND
		8/18/2015	11:22:00 AM	ND	0.583	1.46	138	ND	ND	66.4	ND	0.06	2.25	ND	0.38	12.8	1.55	ND	1.94	ND	2.92	0.57	ND	36	ND	2.38	12.3
		8/19/2015	12:33:00 PM	32.9	0.513	1.32	122	ND	ND	64.5	ND	0.07	1.91	ND	ND	12.9	1.79	ND	1.96	ND	2.75	0.56	ND	36.1	ND	2.46	8.68
		8/20/2015	7:21:00 AM	24.4	0.341	1.42	138	ND	ND	61.2	ND	0.08	2.33	ND	ND	12.4	ND	ND	1.86	ND	2.6	0.62	ND	36.1	ND	2.61	9.07
		8/24/2015	1:55:00 PM	410	0.331	1.56	80	ND	ND	57.5	ND	0.14	2.76	265	ND	12.8	9.36	ND	1.78	0.886	2.86	0.58	ND	38.6	ND	3.76	6.39
		8/25/2015	2:25:00 PM	ND	0.289	1.48	78	ND	ND	55.9	ND	0.05	2.27	ND	ND	12.7	1.63	ND	1.91	ND	2.75	0.56	ND	37.8	ND	3.04	ND
		8/26/2015	1:30:00 PM	ND	0.302	1.52	75	ND	ND	56	ND	0.05	2.5	ND	ND	13.1	2.36	ND	1.81	0.888	2.78	0.61	ND	37.5	ND	3.17	5.31
		8/27/2015	1:55:00 PM	293	0.4	1.37	82	ND	ND	52.4	ND	0.17	2.57	199	ND	13.3	8.35	ND	1.88	0.916	2.85	0.58	0.0249	36.4	ND	3.1	ND
8/28/2015	2:45:00 PM	ND	0.37	0.8	151	ND	ND	85.6	ND	0.11	3.28	ND	ND	14.3	ND	ND	3.05	1.21	5.25	0.86	ND	51.3	ND	2.02	ND		
9/22/2015	1:55:00 PM	ND	0.58	1.39	78	ND	ND	66.4	ND	0.1	3.67	ND	0.3	16.4	1.7	ND	1.82	1.22	2.81	0.6	0.0692	39	0.04	2.93	ND		

Domestic Source Water Screening Values - Dissolved Metals

		No Exceedence	Above Screening Level		Prior to Plume Arrival				Estimated Plume Arrival					Post Plume Arrival													
			Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc	
			ug/L	ug/L	10 ug/L	1,000 ug/L	4 ug/L	10 ug/L	mg/L	50 ug/L	ug/L	ug/L	ug/L	15 ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	50 ug/L	50 ug/L	mg/L	ug/L	ug/L	
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	mg/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	
4953000	San Juan R @ Mexican Hat US163 Xing	8/8/2015	5:40:00 PM	264	1.38	1.57	308	0.04	ND	49.2	ND	0.13	3.95	144	ND	5.75	2.81	ND	3.15	0.885	4.15	0.92	0.0956	62.6	ND	3.13	14.2
		8/10/2015	11:53:00 AM	325	0.376	1.94	299	ND	ND	44.6	ND	0.1	2.95	140	0.32	7.84	2.55	ND	2.43	ND	3.41	0.61	0.0297	43.6	ND	7.59	17.6
		8/10/2015	4:44:00 PM	149	1.26	1.4	265	ND	ND	44.2	ND	0.08	2.48	ND	0.32	7.87	ND	ND	2.63	ND	3.35	0.75	0.193	41.9	ND	6.67	18.5
		8/11/2015	11:31:00 AM	907	1.42	1.98	391	0.05	ND	37.2	ND	0.18	3.13	382	ND	6.72	4.55	ND	2.46	0.847	3.29	0.78	0.205	51.3	0.04	7.82	12.4
		8/11/2015	3:43:00 PM	1790	1.23	1.59	445	0.07	ND	43.6	ND	0.31	5.28	787	0.57	7.19	11.6	ND	1.98	1.02	3.11	0.82	0.23	41.4	0.03	4.55	17.4
		8/12/2015	12:09:00 PM	125	1.41	1.59	245	0.03	ND	59.8	ND	0.05	3.34	ND	ND	7.86	ND	ND	2.27	ND	3.09	0.92	0.151	42.1	ND	3.07	14.2
		8/12/2015	5:50:00 PM	105	2.23	1.79	185	0.09	ND	48.9	ND	0.07	3.19	ND	ND	7.22	ND	ND	2.64	ND	3.16	1.16	0.264	48.7	ND	4.34	16.1
		8/13/2015	12:05:00 PM	293	1.61	2.06	201	ND	ND	42.6	ND	0.15	3.46	143	ND	7.21	3.54	ND	2.33	0.764	3.3	1.18	0.182	44.4	ND	7.13	19.8
		8/14/2015	11:43:00 AM	120	1.04	2.33	157	0.04	ND	46.2	ND	0.24	5.86	ND	ND	10.5	2.43	ND	5.87	1.75	4.29	1.56	0.152	68	0.18	8.06	ND
		8/15/2015	9:43:00 AM	135	1.04	1.7	117	0.03	ND	53.7	ND	0.58	8.56	ND	ND	9.03	7.42	ND	3.28	1.66	3.62	1.19	0.192	51.9	0.06	5.65	6.18
		8/16/2015	11:58:00 AM	84.3	0.447	1.35	194	0.03	ND	57.7	ND	0.12	3.92	ND	ND	8.96	ND	ND	2.31	ND	3.5	0.84	0.0298	40.2	ND	3.31	13.8
		8/17/2015	3:04:00 PM	52.3	0.817	1.55	108	ND	ND	59.3	ND	0.13	2.85	ND	ND	10.3	ND	ND	2.55	1.23	3.42	0.86	0.186	37.3	0.04	3.4	ND
		8/18/2015	11:55:00 AM	123	1.59	1.42	258	ND	ND	65.3	ND	0.14	3.05	ND	0.5	11.9	3.96	ND	2.09	ND	3.05	0.6	0.0934	35.8	0.04	2.97	20.4
		8/19/2015	1:03:00 PM	83.3	0.427	1.45	219	ND	ND	65.7	ND	0.1	2.86	ND	0.31	12.8	3.51	ND	2.02	ND	2.96	0.68	ND	38.4	ND	3.2	9.29
		8/20/2015	6:56:00 AM	50.4	0.353	1.42	200	ND	ND	66.4	ND	0.07	2.19	ND	ND	12.6	ND	ND	1.98	ND	2.79	0.6	ND	36.9	ND	2.98	8.35
		8/24/2015	1:10:00 PM	39.9	0.387	1.53	87	ND	ND	61	ND	0.05	1.89	ND	ND	13.6	1.59	ND	1.92	ND	2.95	0.65	0.0336	39.8	ND	3.29	4.78
		8/25/2015	1:40:00 PM	308	0.286	1.48	82	ND	ND	57.6	ND	0.14	2.55	185	0.4	12.7	6.37	ND	1.73	ND	2.87	0.58	ND	38.4	ND	3.84	6.19
8/26/2015	1:00:00 PM	ND	0.292	1.5	81	ND	ND	56.2	ND	0.06	2.36	ND	ND	12.6	ND	ND	1.86	ND	2.77	0.64	ND	37.6	ND	3.34	ND		
8/27/2015	1:15:00 PM	386	0.606	1.6	83	0.04	ND	56.9	ND	0.22	2.53	222	0.27	12.9	11.3	ND	2.11	1.51	2.99	0.76	0.0697	37.2	0.07	4.17	6.73		
8/28/2015	2:00:00 PM	ND	0.635	1.2	186	ND	ND	73.3	ND	0.1	2.86	ND	ND	15.9	ND	ND	4.12	1.96	5.1	2.91	ND	70.9	ND	4.45	ND		
9/22/2015	9:56:00 AM	ND	0.354	1.39	93	ND	ND	75.2	ND	0.09	2.08	ND	ND	18.3	ND	ND	1.87	ND	3.11	0.72	ND	43.4	ND	3.31	ND		
10/26/2015	4:15:00 PM	ND	0.597	1.1	114	0.03	ND	79.7	ND	0.15	1.27	ND	ND	15	ND	ND	1.88	ND	3.48	0.75	0.0517	44	0.03	2.53	ND		
4952940	San Juan R @ Clay Hills	8/13/2015	2:42:00 PM	643	0.18	1.76	411	0.06	ND	52.3	ND	0.3	4.36	388	0.92	7.5	13.8	ND	2.16	1.09	3.09	0.91	ND	47	ND	4.99	19.2
		8/14/2015	2:33:00 PM	38.5	0.316	1.89	121	ND	ND	51.1	ND	0.13	3.6	ND	ND	8.23	ND	ND	3.3	1.28	3.69	1.13	0.0286	49.8	ND	5.38	ND
		8/15/2015	2:30:00 PM	119	0.343	1.75	136	ND	ND	43.1	ND	0.08	2.6	ND	ND	8.99	ND	4.27	0.947	3.62	1.18	ND	66.3	ND	5.48	ND	
		8/16/2015	2:46:00 PM	925	0.25	1.71	319	0.05	ND	52.7	ND	0.31	5.26	490	0.46	9.48	9.63	ND	2.78	0.835	4.17	0.91	ND	58.2	ND	5.71	20.6
		8/17/2015	1:03:00 PM	101	0.263	1.63	132	ND	ND	53.2	ND	0.25	4.65	ND	ND	8.79	2.7	ND	2.55	1.36	3.89	0.73	ND	44.5	ND	4.83	ND
		8/18/2015	1:45:00 PM	53.2	0.552	1.56	279	ND	ND	60.6	ND	0.08	2.62	ND	0.3	9.91	ND	ND	2.17	ND	3.49	0.64	0.0427	38.3	ND	3.61	20.5
		8/19/2015	3:09:00 PM	74.8	0.626	1.57	331	ND	ND	65.7	ND	0.1	2.15	ND	ND	11.4	1.62	ND	2.23	0.897	3.36	0.62	ND	38.1	ND	4.01	15.3
		8/24/2015	10:37:00 AM	33.8	1.01	1.82	124	ND	ND	62.4	ND	0.05	2.09	ND	ND	12.8	1.96	ND	2.54	0.778	2.96	0.64	0.0842	39.7	ND	4.71	ND
		8/25/2015	11:15:00 AM	44.8	0.728	1.64	118	ND	ND	63	ND	0.07	2.07	ND	ND	13.3	ND	ND	2.04	0.901	3.07	0.61	ND	40.9	ND	4.59	ND
		8/26/2015	10:05:00 AM	ND	0.335	1.63	117	ND	ND	59.3	ND	0.07	2.39	ND	ND	12.2	ND	ND	2.11	ND	2.9	0.5	ND	38.7	ND	4.56	ND
		8/27/2015	10:35:00 AM	707	0.666	2.89	165	0.05	ND	44.2	ND	0.36	2.56	296	0.33	11.7	10.1	ND	2.38	1.51	4.89	1.19	0.0607	45.4	0.05	12.6	6.78
		8/28/2015	10:25:00 AM	493	0.493	1.56	338	ND	ND	239	ND	0.27	2.82	216	ND	35.5	7.82	ND	3.11	1.2	7.19	1.3	ND	65.9	ND	6.08	ND
		9/23/2015	1:45:00 PM	68.3	0.671	1.61	136	ND	ND	77.8	ND	0.14	1.78	ND	ND	17.3	4.58	ND	2.16	1.29	3.15	0.65	0.0626	41.3	0.04	3.98	ND
		10/27/2015	2:45:00 PM	1100	0.593	1.57	152	0.07	ND	75.8	ND	1.08	2.29	774	0.47	14.1	16.1	ND	2.38	1.21	4.36	0.94	ND	58.3	ND	5.01	ND

Aquatic Life Water Quality Criteria

Comparison of San Juan River 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 acute aluminum standard was exceeded at all sample locations on all dates.. Total aluminum concentrations exceeded 100,000 µg/L at the Stateline site on August 27th and 28th, October 2, and October 19th, 20th, 21st, and 23rd; at the Montezuma site on August 28th and October 23rd, the Sand Island site on August 28th and October 24th; at the Mexican Hat site on August 11th, August 28th and October 24th; at the Clay Hills site on August 15th and October 27th. Some of these exceedances appear to correlate with an increase in discharge on August 26 through 27, 2015 related to precipitation.

The chronic aquatic life standards for iron and mercury were exceeded at the Stateline site on August 11 and August 28. The cadmium and copper chronic standards were also exceeded on August 28th. Mercury concentrations exceeded the chronic standard at McElmo Wash on September 23rd, the only day a sample was collected from this location. The analytical method used for mercury does not have sufficient sensitivity and the detection limit is higher than the standard. Therefore, all detected concentrations are above the standard and nondetect concentrations are too high to determine if the water concentrations comply with the standard and this remains a significant uncertainty. Zinc concentrations exceeded the acute and chronic standard on August 28th at Montezuma. No other exceedances of the zinc standards were observed.

Aquatic Life Water Quality Criteria

		No Exceedence		Above Screening Level			Prior to Plume Arrival			Estimated Plume Arrival					Post Plume Arrival														
				Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc		
		Utah Aquatic Life Use Criteria 1-hr		750		340			2		670		13	1000	65					468		18.4	1.6				120		
		Utah Aquatic Life Use Criteria 4-day		87		150			0.25		74		9	1000	2.5			0.01		52		4.6					120		
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	mg/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	
4954000	San Juan R @ US160 Xing in CO	8/8/2015	1:23:00 PM	47400	0.524	1.34	222	0.0369	ND	51.5	ND	0.127	2.24	95.8	ND	7.85	2.94	ND	1.87	ND	2.96	0.722	ND	32.2	ND	4.86	15.3		
		8/9/2015	12:02:00 PM	33900	0.341	0.628	274	ND	ND	50.6	ND	0.0817	2.48	119	ND	6.86	2.69	ND	2.01	ND	2.61	0.563	0.03	28.5	ND	1.76	18.5		
		8/9/2015	3:05:00 PM	26700	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
		8/9/2015	6:00:00 PM	24600	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
		8/9/2015	9:02:00 PM	31000	0.347	0.946	341	0.0356	ND	46	ND	0.139	3.47	198	0.274	6.3	4.14	ND	1.94	ND	2.38	0.535	ND	30	ND	2.07	15.4		
		8/10/2015	9:11:00 AM	39900	0.458	0.994	233	ND	ND	44.6	ND	0.0673	3.21	103	0.391	6.01	1.64	ND	2.03	ND	2.51	0.582	ND	34.1	ND	1.74	19.7		
		8/10/2015	2:06:00 PM	43700	0.711	1.3	220	0.0905	ND	44.2	ND	0.407	3.35	732	1.04	6.02	12.8	ND	1.92	0.838	2.72	0.645	0.06	35.1	ND	3.64	18		
		8/11/2015	8:50:00 AM	77000	0.364	1.72	451	0.102	ND	39.8	ND	0.488	4.85	1520	1.1	5.05	19	0.02	1.65	1.19	3	0.972	ND	43.7	ND	3.9	19.1		
		8/11/2015	1:17:00 PM	56900	0.0516	1.33	334	ND	ND	41.7	ND	0.155	3.03	366	0.27	5.11	5.1	ND	1.58	ND	2.91	0.76	ND	37	ND	2.46	14.9		
		8/12/2015	9:50:00 AM	31100	0.586	0.879	178	ND	ND	52.1	ND	0.0614	2.39	ND	ND	7.2	ND	ND	1.47	ND	2.79	0.782	0.03	30.3	ND	1.9	14.8		
		8/12/2015	2:04:00 PM	28500	0.548	1.21	151	ND	ND	47.9	ND	0.0478	2.61	ND	ND	6.97	1.82	ND	1.48	ND	2.74	0.728	ND	27.3	ND	2.87	16.5		
		8/13/2015	10:01:00 AM	38700	0.158	1.25	213	0.0299	ND	48.3	ND	0.122	3.67	148	0.373	6.48	3.16	ND	1.89	ND	2.87	0.858	ND	42.5	ND	2.1	21.9		
		8/14/2015	2:33:00 PM	44300	0.421	1.7	72.3	0.0382	ND	53.4	ND	0.133	3.86	ND	ND	6.61	1.8	ND	3.65	3.14	3.66	1.1	ND	52.4	0.0385	4.11	ND		
		8/15/2015	12:04:00 PM	14200	0.445	1.36	65.2	ND	ND	52.8	ND	0.052	1.35	ND	ND	7.91	ND	ND	2.25	ND	2.61	0.608	ND	25.9	ND	2.61	ND		
		8/16/2015	9:15:00 AM	9500	1.12	0.88	179	0.041	ND	53.9	ND	ND	2.91	ND	ND	8.18	ND	ND	1.72	ND	2.54	0.595	0.19	26.1	ND	1.92	12.6		
		8/18/2015	9:56:00 AM	3640	0.689	1.31	148	ND	ND	57.5	ND	0.0869	2.27	ND	0.287	9.82	ND	ND	1.74	ND	2.5	0.585	0.04	33.4	ND	1.88	12.3		
		8/19/2015	9:30:00 AM	4070	0.682	1.34	106	ND	ND	57.1	ND	0.0697	1.7	ND	ND	9.98	ND	ND	1.72	ND	2.54	0.538	0.03	34.1	ND	1.91	8.44		
		8/20/2015	9:44:00 AM	3650	0.764	1.32	132	ND	ND	57	ND	0.0772	1.85	ND	0.55	ND	ND	1.76	ND	2.44	0.631	0.1	33.8	0.0365	1.93	8.1			
		8/24/2015	3:10:00 PM	1760	0.273	1.36	62.4	ND	ND	50	ND	0.048	2.18	ND	ND	8.95	1.92	ND	1.56	1.08	2.64	0.538	ND	32.6	ND	2.31	5.49		
		8/25/2015	3:30:00 PM	1500	0.481	1.42	63.4	ND	ND	47.8	ND	ND	2.11	ND	ND	8.74	1.88	ND	1.58	ND	2.52	0.579	ND	31.8	ND	2.52	ND		
		8/26/2015	2:50:00 PM	1540	0.563	1.47	70.5	0.0621	ND	47.5	ND	0.308	2.75	554	0.459	8.82	21.8	ND	1.57	1.05	2.61	0.622	0.07	32.2	0.0304	3.29	8		
		8/27/2015	3:40:00 PM	117000	0.335	1.01	121	0.0635	ND	65.9	ND	0.383	3.3	605	0.527	10.2	11.4	ND	3.32	2.04	4.58	0.943	ND	49.2	ND	3.41	6.22		
		8/28/2015	4:25:00 PM	196000	0.249	5.55	340	1.58	0.261	59.4	12	9.01	27.7	16700	15.7	10	413	0.04	1.45	12.7	7.89	0.821	0.09	89.6	0.18	26.2	72.8		
		9/23/2015	6:30:00 PM	5120	0.724	0.985	81.5	0.105	ND	60.8	ND	0.253	1.88	ND	ND	10.9	9.31	ND	1.82	1.31	2.87	0.666	0.13	35	0.115	1.84	ND		
		10/2/2015	12:00:00 PM	183000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/15/2015		34400	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/18/2015		39000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/19/2015		12:00:01 AM	23900	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/19/2015		12:00:00 PM	166000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/20/2015		12:01:00 AM	202000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/20/2015		12:00:00 PM	248000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/21/2015		12:00:01 AM	230000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
10/22/2015	12:00:00 PM	94800		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS		
10/23/2015	12:00:10 AM	138000		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS		
10/23/2015	12:00:00 PM	189000		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS		
GK06	San Juan R @ McElmo Wash	9/23/2015		10:40:00 AM	3350	0.402	1.1	60.6	ND	ND	165	ND	0.165	1.11	ND	ND	73.6	2.44	0.02	2.59	2.01	4.49	0.631	0.03	65.4	ND	1.43	ND	

Aquatic Life Water Quality Criteria

No Exceedence				Above Screening Level				Prior to Plume Arrival				Estimated Plume Arrival						Post Plume Arrival											
				Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc		
Utah Aquatic Life Use Criteria 1-hr				750		340			2		570		13	1000	65					468		18.4	1.6				120		
Utah Aquatic Life Use Criteria 4-day				87		150			0.25		74		9	1000	2.5			0.01		52		4.6					120		
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	mg/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L		
4953990	San Juan R @ Town of Montezuma	8/8/2015	2:54:00 PM	67300	0.747	1.06	223	0.0395	ND	71.5	ND	0.13	2.72	ND	9.92	ND	ND	2.62	0.804	3.84	1.11	0.04	43.5	ND	2.54	21			
		8/10/2015	10:13:00 AM	32300	0.66	0.941	262	ND	ND	49.8	ND	0.0764	3.24	144	0.461	7.7	3.22	ND	2.03	ND	2.69	0.567	0.05	32.1	ND	2.13	17.3		
		8/10/2015	2:58:00 PM	39100	1.31	0.933	200	0.0336	ND	48.6	ND	0.0595	2.48	ND	0.297	7.35	ND	ND	2.32	ND	2.59	0.609	0.25	31.8	ND	1.96	14.6		
		8/11/2015	9:44:00 AM	52800	0.568	1.17	314	ND	ND	44.6	ND	0.127	2.66	227	ND	6.49	3.31	ND	1.72	ND	2.64	0.678	0.03	37.1	ND	2.21	12.9		
		8/11/2015	2:20:00 PM	54700	0.136	1.25	298	0.0423	ND	44.8	ND	0.24	3.47	668	0.489	6.57	9.99	ND	1.72	0.952	2.96	0.741	ND	38.3	ND	2.73	14.3		
		8/12/2015	10:37:00 AM	31500	0.799	1.1	202	0.0304	ND	48.3	ND	ND	2.49	ND	ND	7.23	ND	ND	1.66	ND	2.67	0.798	0.04	31.9	ND	1.68	13.5		
		8/12/2015	2:57:00 PM	35000	0.822	0.912	176	ND	ND	48.9	ND	0.0898	4.34	296	ND	7.5	2.28	ND	1.64	ND	2.84	0.716	0.03	33.8	ND	1.99	15.9		
		8/13/2015	4:46:00 PM	23700	1.88	1.28	240	0.0654	ND	49.4	ND	0.18	3.75	192	ND	8.08	5.3	ND	1.91	0.984	2.62	0.978	0.24	32.9	0.025	3.12	32.7		
		8/14/2015	9:55:00 AM	62000	0.582	1.27	85.1	0.0403	ND	55.1	ND	0.146	3.79	ND	ND	7.81	ND	ND	2.84	1.76	3.51	0.989	0.04	53	0.0272	3.07	ND		
		8/15/2015	11:31:00 AM	29200	0.642	1.58	73.6	0.0432	ND	55	ND	0.244	4.38	ND	ND	8.57	3.36	ND	2.43	1.09	3.16	0.888	0.07	35.8	ND	3.54	ND		
		8/16/2015	10:02:00 AM	13600	0.835	1.17	145	0.0638	ND	57.5	ND	0.092	3.01	ND	ND	9.36	ND	ND	1.99	ND	2.96	0.667	0.28	30.3	0.0527	2.16	9.78		
		8/17/2015	4:07:00 PM	4160	0.285	1.17	80.4	ND	ND	60.2	ND	0.137	1.87	ND	ND	11.6	2.4	ND	1.97	ND	2.82	0.63	ND	29.4	ND	2.18	ND		
		8/18/2015	8:41:00 AM	4450	1.02	1.19	197	0.0327	ND	62.7	ND	0.0974	3.44	ND	0.316	12.7	ND	ND	2.07	ND	2.64	0.629	0.14	35.4	0.0785	2.29	14.8		
		8/19/2015	8:15:00 AM	4330	0.947	1.22	141	ND	ND	63.1	ND	0.0794	1.67	ND	ND	13.7	ND	ND	1.99	ND	2.67	0.648	0.1	37.7	0.0349	2.3	9.64		
		8/20/2015	8:59:00 AM	3650	0.994	1.4	128	ND	ND	62.7	ND	0.071	1.93	ND	ND	13.4	ND	ND	1.8	ND	2.62	0.66	ND	37.5	ND	2.14	6.64		
		8/24/2015	4:30:00 PM	2170	0.284	1.38	67.8	ND	ND	55.9	ND	0.0989	2.31	ND	ND	12.8	4.86	ND	1.71	0.762	2.84	0.601	ND	38.4	ND	2.93	ND		
		8/25/2015	4:20:00 PM	1500	0.278	1.26	68.2	ND	ND	55.9	ND	0.0799	2.63	ND	ND	13.2	2.03	ND	1.8	0.934	2.71	0.589	ND	37.6	ND	2.71	10		
		8/26/2015	3:30:00 PM	1250	0.429	1.46	77.1	0.0556	ND	57.6	ND	0.295	2.93	601	0.49	14.3	26.5	ND	1.76	1.13	2.96	0.636	ND	38.4	ND	3.76	5.37		
		8/27/2015	2:50:00 PM	22200	0.355	1.4	71.1	ND	ND	47.9	ND	0.188	2.06	ND	ND	10.4	3.95	ND	2.09	ND	2.76	0.711	ND	36.6	ND	2.67	ND		
		8/28/2015	3:35:00 PM	191000	0.321	1.09	161	0.0427	ND	95	ND	0.316	4.04	414	0.368	11.4	11.5	ND	2.67	1.62	6.46	0.793	ND	60.3	ND	2.78	191		
		9/22/2015	5:30:00 PM	1300	0.265	1.3	75	ND	ND	70.3	ND	0.103	3.28	ND	ND	17.4	1.73	ND	1.75	1.42	2.92	0.574	ND	41.4	ND	2.83	5.88		
		10/2/2015	12:00:00 PM	14100	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/15/2015	12:00:00 PM	14800	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/19/2015	12:00:01 AM	5790	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/19/2015	12:00:00 PM	15200	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/20/2015	12:00:01 AM	53800	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/20/2015	12:00:00 PM	35800	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/21/2015	12:00:01 AM	30200	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/23/2015	12:00:00 PM	94300	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/23/2015	12:00:10 AM	273	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
10/23/2015	12:00:00 PM	223000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS		
10/26/2015	2:00:00 PM	45800	0.946	1.03	109	ND	ND	74.9	ND	0.557	1.3	ND	ND	15.2	2.03	ND	1.8	0.756	3.25	0.6	ND	41	ND	1.86	ND				

Aquatic Life Water Quality Criteria

		No Exceedence			Above Screening Level				Prior to Plume Arrival				Estimated Plume Arrival				Post Plume Arrival												
					Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc	
		Utah Aquatic Life Use Criteria 1-hr			750		340			2		570		13	1000	65					468		18.4	1.6				120	
		Utah Aquatic Life Use Criteria 4-day			87		160		0.25		74		9	1000	2.5			0.01		52		4.6					120		
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	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	
4953250	San Juan R @ Sand Island	8/8/2015	4:19:00 PM	55700	1.38	1.03	294	0.0574	ND	73.7	ND	0.124	3.86	104	ND	9.24	2.55	ND	3.3	1.01	4.11	1.43	0.12	51.2	ND	2.22	19		
		8/10/2015	11:15:00 AM	27000	1.24	0.878	192	ND	ND	53.2	ND	0.0685	2.07	ND	0.287	8.4	ND	ND	2.38	ND	2.86	0.692	0.25	28.4	ND	1.75	13.7		
		8/10/2015	3:58:00 PM	28700	0.574	1.07	184	ND	ND	48.4	ND	0.0556	1.96	ND	0.315	7.83	ND	ND	2.26	ND	2.67	0.526	ND	30.6	ND	1.89	13.2		
		8/11/2015	10:53:00 AM	47800	1.18	1.23	278	0.059	ND	45.8	ND	0.172	2.87	328	ND	6.93	4.12	ND	1.92	0.778	2.72	0.685	0.27	36.8	0.031	2.55	13.7		
		8/11/2015	3:01:00 PM	48700	0.271	1.01	251	ND	ND	45.3	ND	0.0864	2.69	89.2	ND	6.65	ND	ND	1.85	ND	2.76	0.673	ND	36.6	ND	2.05	14.9		
		8/12/2015	11:12:00 AM	45400	1.08	1.41	205	0.0499	ND	48.8	ND	0.154	3.44	310	ND	6.98	4.47	ND	1.93	ND	2.91	0.793	0.06	37.8	ND	2.61	14.5		
		8/12/2015	5:06:00 PM	30600	1.78	1.43	260	0.0633	ND	46.6	ND	0.162	2.98	314	ND	7.07	5.16	ND	1.81	0.913	2.79	0.781	0.15	33.5	ND	2.32	13.2		
		8/13/2015	11:28:00 AM	19300	0.667	1.3	156	0.0326	ND	53.6	ND	0.21	3.1	275	ND	8.21	8.9	ND	1.62	ND	2.96	0.68	ND	29.2	ND	3.85	20.4		
		8/14/2015	11:02:00 AM	66300	1.03	2.03	78.6	0.0535	ND	53.2	ND	0.131	3.31	ND	ND	8.26	7.02	ND	5.31	2.38	3.27	1.08	0.19	49.5	0.129	5.88	4.87		
		8/15/2015	10:30:00 AM	37600	1.12	1.84	83.5	0.0411	ND	55.7	ND	0.085	2.27	ND	ND	8.4	ND	ND	3.93	0.816	3.46	1.06	0.28	46.7	0.0523	3.45	10.0		
		8/16/2015	11:06:00 AM	24600	0.425	1.23	149	0.0361	ND	55.8	ND	0.146	3.89	202	ND	10.2	3.94	ND	1.95	ND	2.91	0.707	0.04	36.3	ND	2.04	10.5		
		8/17/2015	3:33:00 PM	10200	0.408	1.48	87.1	ND	ND	62.4	ND	0.172	2.11	ND	ND	11.2	ND	ND	2.67	1.28	3.13	0.626	ND	30	ND	2.75	10.0		
		8/18/2015	11:22:00 AM	7320	0.583	1.48	138	ND	ND	86.4	ND	0.0643	2.25	ND	0.382	12.8	1.55	ND	1.94	ND	2.92	0.57	ND	36	ND	2.38	12.3		
		8/19/2015	12:33:00 PM	5980	0.513	1.32	122	ND	ND	64.5	ND	0.0747	1.91	ND	ND	12.9	1.79	ND	1.96	ND	2.75	0.584	ND	36.1	ND	2.46	8.68		
		8/20/2015	7:21:00 AM	5770	0.341	1.42	138	ND	ND	61.2	ND	0.0766	2.33	ND	ND	12.4	ND	ND	1.86	ND	2.6	0.617	ND	36.1	ND	2.61	9.07		
		8/24/2015	1:55:00 PM	2210	0.331	1.56	79.6	ND	ND	57.5	ND	0.136	2.76	265	ND	12.8	9.36	ND	1.78	0.888	2.86	0.581	ND	36.6	ND	3.76	6.39		
		8/25/2015	2:25:00 PM	2070	0.289	1.48	77.5	ND	ND	55.9	ND	0.0455	2.27	ND	ND	12.7	1.63	ND	1.91	ND	2.75	0.563	ND	37.8	ND	3.04	10.0		
		8/26/2015	1:30:00 PM	1620	0.302	1.52	75.4	ND	ND	56	ND	0.0524	2.5	ND	ND	13.1	2.36	ND	1.81	0.888	2.78	0.606	ND	37.5	ND	3.17	5.31		
		8/27/2015	1:55:00 PM	1250	0.4	1.37	81.5	ND	ND	52.4	ND	0.173	2.57	199	ND	13.3	8.35	ND	1.88	0.916	2.85	0.579	0.02	36.4	ND	3.1	ND		
		8/28/2015	2:45:00 PM	125000	0.37	0.797	151	ND	ND	85.6	ND	0.114	3.28	ND	ND	14.3	ND	ND	3.05	1.21	5.25	0.864	ND	51.3	ND	2.02	10.0		
		9/22/2015	1:55:00 PM	1720	0.58	1.39	77.8	ND	ND	66.4	ND	0.0978	3.67	ND	0.3	16.4	1.7	ND	1.82	1.22	2.81	0.604	0.07	39	0.0396	2.93	ND		
		10/15/2015	12:00:00 PM	16400	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/19/2015	12:00:01 AM	11000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/19/2015	12:00:00 PM	16500	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/20/2015	12:00:01 AM	85700	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/20/2015	12:00:00 PM	71800	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/21/2015	12:00:01 AM	67200	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/23/2015	12:00:10 AM	45700	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/23/2015	12:00:00 PM	89800	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		10/24/2015	12:00:10 AM	200000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		4953000	San Juan R @ Mexican Hat US163.Xing	8/8/2015	5:40:00 PM	63400	1.38	1.57	308	0.0435	ND	49.2	ND	0.127	3.95	144	ND	5.75	2.81	ND	3.15	0.885	4.15	0.924	0.1	62.6	ND	3.13	14.2
				8/10/2015	11:53:00 AM	90800	0.376	1.94	299	ND	ND	44.6	ND	0.102	2.95	140	0.315	7.84	2.55	ND	2.43	ND	3.41	0.606	0.03	43.6	ND	7.59	17.6
8/10/2015	4:44:00 PM			80600	1.26	1.4	265	ND	ND	44.2	ND	0.0789	2.48	ND	0.315	7.87	ND	ND	2.63	ND	3.35	0.753	0.19	41.9	ND	6.67	18.5		
8/11/2015	11:31:00 AM			111000	1.42	1.98	391	0.0491	ND	37.2	ND	0.179	3.13	382	ND	6.72	4.55	ND	2.46	0.847	3.29	0.775	0.21	51.3	0.0362	7.82	12.4		
8/11/2015	3:43:00 PM			56400	1.23	1.59	445	0.0695	ND	43.6	ND	0.311	5.28	787	0.569	7.19	11.6	ND	1.98	1.02	3.11	0.821	0.23	41.4	0.027	4.55	17.4		
8/12/2015	12:09:00 PM			54700	1.41	1.59	245	0.0328	ND	59.8	ND	0.0512	3.34	ND	ND	7.86	ND	ND	2.27	ND	3.09	0.923	0.15	42.1	ND	3.07	14.2		
8/12/2015	5:50:00 PM			71400	2.23	1.79	185	0.0863	ND	48.9	ND	0.0691	3.19	ND	ND	7.22	ND	ND	2.64	ND	3.16	1.16	0.26	48.7	ND	4.34	16.1		
8/13/2015	12:05:00 PM			44700	1.61	2.06	201	ND	ND	42.6	ND	0.148	3.46	143	ND	7.21	3.54	ND	2.33	0.764	3.3	1.18	0.18	44.4	ND	7.13	19.8		
8/14/2015	11:43:00 AM			124000	1.04	2.33	157	0.0429	ND	46.2	ND	0.236	5.86	ND	ND	10.5	2.43	ND	5.87	1.75	4.29	1.56	0.15	68	0.182	8.06	6.18		
8/15/2015	9:43:00 AM			63700	1.04	1.7	117	0.032	ND	53.7	ND	0.575	8.58	ND	ND	9.03	7.42	ND	3.28	1.66	3.62	1.19	0.19	51.9	0.0557	5.65	6.18		
8/16/2015	11:58:00 AM			34300	0.447	1.35	194	0.03	ND	57.7	ND	0.12	3.92	ND	ND	8.96	ND	ND	2.31	ND	3.5	0.836	0.03	40.2	ND	3.31	13.8		
8/17/2015	3:04:00 PM			16900	0.817	1.55	108	ND	ND	59.3	ND	0.128	2.85	ND	ND	10.3	ND	ND	2.55	1.23	3.42	0.859	0.19	37.3	0.0425	3.4	ND		
8/18/2015	11:55:00 AM			17400	1.59	1.42	258	ND	ND	65.3	ND	0.137	3.05	ND	0.503	11.9	3.96	ND	2.09	ND	3.05	0.603	0.09	35.8	0.0402	2.97	20.4		
8/19/2015	1:03:00 PM			7110	0.427	1.45	219	ND	ND	65.7	ND	0.0987	2.86	ND	0.311	12.8	3.51	ND	2.02	ND	2.96	0.677	ND	38.4	ND	3.2	9.29		
8/20/2015	6:56:00 AM			5790	0.353	1.42	200	ND	ND	66.4	ND	0.0685	2.19	ND	ND	12.6	ND	ND	1.98	ND	2.79	0.598	ND	36.9	ND	2.98	8.35		
8/24/2015	1:10:00 PM			3410	0.387	1.53	87.4	ND	ND	61	ND	0.0534	1.89	ND	ND	13.6	1.59	ND	1.92	ND	2.95	0.653	0.03	39.8	ND	3.29	4.78		
8/25/2015	1:40:00 PM			2890	0.286	1.48	82.3	ND	ND	57.6	ND	0.137	2.55	185	0.4	12.7	6.37	ND	1.73	ND	2.87	0.577	ND	38.4	ND	3.84	6.19		
8/26/2015	1:00:00 PM			2190	0.292	1.5	81	ND	ND	56.2	ND	0.0589	2.36	ND	ND	12.6	ND	ND	1.86	ND	2.77	0.635	ND	37.6	ND	3.34	10.0		
8/27/2015	1:15:00 PM			2860	0.606	1.6	83.3	0.043	ND	58.9	ND	0.216	2.53	222	0.274	12.9	11.3	ND	2.11	1.51	2.99	0.757	0.07	37.2	0.0662	4.17	6.73		
8/28/2015	2:00:00 PM			163000	0.635	1.2	186	ND	ND	73.3	ND	0.103	2.86	ND	ND	15.9	ND	ND	4.12	1.96	5.1	2.91	ND	70.9	ND	4.45	10.0		
9/22/2015	9:56:00 AM			2530	0.354	1.39	90.1	ND	ND	74.2	ND	0.0835	2.98	ND</															

Finished Drinking Water Screening Values - Total Metals

Comparison of Total Metals Data from Drinking Water Systems with Drinking Water Standards

None of the public water systems regulated by the State of Utah have surface water intake directly from San Juan River. The consumer's exposure to elevated levels of these metals through public drinking water supply is expected to be minimal. Nonetheless, the Division of Drinking Water (DDW) reviewed recent metals data collected in two community water systems located near San Juan River, i.e. Mexican Hat Special Services District and Bluff Water Works Service District. The table below shows the metal levels from wells and post-treatment sampling stations in these two water systems. The data of the finished water delivered to the consumers are examined for exceedances of drinking water maximum contaminant level (MCL) or Action Levels (AL). The data do not indicate that the drinking water quality in these water systems has been affected by the Gold King Mine spill. It is noted that the copper results within Mexican Hat's distribution system are above the action level (AL). Most often, plumbing piping (not the source water) is the cause of copper contamination. It is suspected that Mexican Hat's high copper results in its distribution system may be a result of the slightly corrosive nature of the treated water from its water treatment plant. The past samples taken at the well sources did not show elevated copper levels. It is unlikely the exceeded copper levels are caused by the well sources nor the Gold King mine release.

		No Exceedance		Prior to Plume Arrival				Post Plume Arrival													
				ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CHROMIUM	COPPER	CYANIDE	FLUORIDE	LEAD	MERCURY	NICKEL	SELENIUM	THALLIUM				
		EPA Drinking Water MCL or Action Level				6	10	2000	4	5	100	1300	200	4000	15	2	50	2			
	Monitoring Location	Site Description	Collection Date	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			
1	BLUFF WATER WORKS SERVICE DISTRICT	Corral 2003 Well (Prior to Treatment)	12/13/1994	NS	NS	20	NS	NS	NS	NS	NS	NS	NS	910	NS	NS	NS	NS	1		
			5/14/1996	NS	NS	30	NS	NS	NS	NS	NS	NS	NS	NS	100	NS	NS	NS	NS	NS	
			11/10/1998	NS	NS	10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
			11/30/2010	3.7	NS	ND	ND	ND	3.07	NS	ND	102	NS	ND	18.4	ND	ND	ND	ND	ND	
			3/12/2013	ND	NS	ND	ND	ND	ND	NS	ND	55	NS	ND	ND	ND	ND	ND	ND		
		Distribution Piping 001	5/17/1982	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	9	NS	NS	NS	NS	NS	
			7/5/2009	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	
			8/6/2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	
			8/7/2012	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.816	NS	NS	NS	NS	NS	
			9/28/2015	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	4.863	NS	NS	NS	NS	NS	
			9/29/2015	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	11.654	NS	NS	NS	NS	NS	
		I-94 Well (Prior to Treatment)	12/13/1994	NS	NS	20	NS	NS	NS	NS	NS	NS	NS	NS	910	NS	NS	NS	NS	1	
			5/14/1996	NS	NS	30	NS	NS	NS	NS	NS	NS	NS	NS	100	NS	NS	NS	NS	NS	
			11/10/1998	NS	NS	10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
			3/21/2005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	100	NS	NS	NS	NS	NS	
			8/16/2010	ND	NS	ND	ND	0.274	3.16	NS	ND	64.5	NS	ND	ND	ND	ND	ND	0.556	ND	
		Sampling Station 001 (Post Treatment)	3/12/2013	ND	NS	ND	ND	ND	ND	NS	ND	86	NS	ND	ND	ND	ND	ND	ND	ND	
			3/5/2015	NS	2.562	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
			5/14/2015	NS	2.045	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
			9/29/2015	NS	3.478	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
Sampling Station 195 (Post Treatment)	11/10/2015	NS	2.018	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS			
	3/21/2005	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	100	NS	NS	NS	NS	NS			
	11/30/2010	ND	NS	ND	ND	ND	3.65	NS	ND	67.6	NS	ND	ND	ND	ND	0.152	ND				
2	MEXICAN HAT SSD	Distribution Piping 001	3/12/2013	ND	NS	ND	ND	ND	NS	ND	57	NS	ND	ND	ND	ND	ND	ND			
			9/22/2010	NS	NS	NS	NS	NS	NS	150	NS	NS	1.8	NS	NS	NS	NS	NS			
			9/29/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	0.6	NS	NS	NS	NS	NS			
		Sampling Station 097 (Post Treatment)	8/17/2015	NS	NS	NS	NS	NS	NS	NS	NS	1890	NS	NS	0.7	NS	NS	NS	NS		
			9/26/2002	NS	2.6	30	NS	NS	NS	NS	NS	500	NS	NS	NS	NS	NS	9.9	NS		
			6/5/2006	NS	NS	NS	NS	NS	NS	NS	NS	NS	155	NS	NS	NS	NS	4.16	NS		
			2/15/2010	NS	2.1	27	NS	NS	4	NS	NS	NS	NS	NS	NS	NS	9.5	6.2	NS		
			9/26/2011	ND	1.1	9	ND	ND	ND	NS	ND	200	NS	ND	ND	ND	4.4	ND	ND		
			8/17/2015	ND	2.2	32	ND	ND	ND	NS	2	400	NS	ND	ND	ND	8.8	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_i Child body weight for ingestion (16 kg)
 BW_d Child body weight for dermal (30kg)
 IR_i Intake rate for ingestion (0.1 L/day)
 EF_i Exposure factor for ingestion (0.1644 = 60 days/year)
 CF_i Conversion factor, ingestion (1 for mg/L entries)
 SA_d Surface area (whole body, which is 8,750 cm² for children)
 ET_d Exposure time (2 hour/day)
 CF_d Conversion factor, dermal (0.001 for mg/L)
 P_d Permeability coefficient (see table below)

Permeability coefficients	
Aluminum	1.00E-03 (EPA Dermal Exposure Assessment ; EPA RAGS part E Exhibit 3-1)
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 (EPA RAGS part E Exhibit 3-1)
Copper	1.00E-03
Iron	N/A
Lead	4.00E-06
Manganese	1.00E-03
Mercury	1.00E-03 (EPA RAGS part E Exhibit 3-1)
Molybdenum	1.00E-03 (Table 8 from a contractor-derived HHRA for CalDOT ; EPA RAGS part E Exhibit 3-1)
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

		No Exceedence		Above Screening Level			Prior to Plume Arrival				Estimated Plume Arrival					Post Plume Arrival													
				Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	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	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	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L		
4954000	San Juan R @ US160 Xing in CO	8/8/2015	1:23:00 PM	47400	0.27	12.5	1300	3.42	1.27	336	23.9	22.8	41.4	24800	44.5	56.3	2320	0.0767	0.759	40.5	12.2	1.09	0.272	36.6	0.406	61.2	147		
		8/9/2015	12:02:00 PM	33900	0.499	12.3	702	2.62	0.907	106	17.4	16.8	59.3	29400	151	20.3	1100	0.07	1.37	23	9.04	1.07	1.09	29.8	0.377	50.5	160		
		8/9/2015	3:05:00 PM	26700	0.573	13.5	606	2.08	0.734	92.8	14.2	13.5	63	26600	185	17.2	942	0.0633	1.58	18.2	7.53	0.971	1.34	27	0.302	41.6	172		
		8/9/2015	6:00:00 PM	24600	0.502	10	532	1.8	0.68	86.2	13.7	12.4	47.6	24100	111	15.8	870	0.045	1.33	16.8	7.04	0.727	0.794	26.1	0.247	37.8	138		
		8/9/2015	9:02:00 PM	31000	0.416	9.59	554	2.25	0.632	78.8	15.5	14.7	49.7	26500	83.5	15.3	887	0.0483	1.01	18.4	7.18	0.703	0.574	29.5	0.313	41.5	137		
		8/10/2015	9:11:00 AM	39900	0.163	11	1730	3.97	1.15	90.8	21	24.8	69.6	35400	73.5	20.2	1450	0.115	0.527	29.7	8.24	0.939	0.494	36.6	0.385	48.2	668		
		8/10/2015	2:06:00 PM	43700	0.19	12.3	889	4.04	0.884	86.7	23.7	25.4	69.7	39100	69.3	20.1	1390	0.117	0.62	30.8	8.89	0.955	0.422	38.5	0.422	53.4	897		
		8/11/2015	8:50:00 AM	77000	0.216	19.9	1230	6.66	1.2	109	29.5	37	104	54800	82.2	24.9	1930	0.187	0.559	39.4	11.8	1.35	0.568	42.9	0.866	69.4	223		
		8/11/2015	1:17:00 PM	56900	0.181	14.2	971	4.97	0.916	95	21.8	27.3	76.7	40300	62.6	20	1440	0.13	0.612	29.6	9.65	1.08	0.42	37.4	0.679	51.8	159		
		8/12/2015	9:50:00 AM	31100	0.23	11.1	766	3.16	0.905	164	16.1	18.6	43.7	22600	47.4	24.7	1250	0.0983	0.771	28.9	7.9	1.04	0.314	32.7	0.464	43.7	131		
		8/12/2015	2:04:00 PM	28600	0.252	9.21	683	2.52	0.641	146	13.2	14.5	34.3	18100	35.8	24.5	1130	0.0583	0.48	22	7.37	0.751	0.209	28.7	0.283	41.4	96.2		
		8/13/2015	10:01:00 AM	38700	0.156	12	1110	5.62	0.941	124	14.9	28.9	79.3	31100	66.5	22.5	1670	0.153	0.529	28.9	8.54	1.2	0.395	45	0.578	51	177		
		8/14/2015	2:33:00 PM	44300	0.413	12.5	918	4.89	0.984	114	23.7	27.1	70.5	39100	64.3	22.4	1360	0.148	0.772	34.5	10.4	1.32	0.38	54.8	0.706	60	197		
		8/15/2015	12:04:00 PM	14200	0.279	4.7	262	1.08	0.366	68.1	8.75	6.18	18.2	12300	17.4	12.7	368	0.03	1.13	8.78	5.16	0.626	0.141	27.7	0.194	25.7	58.9		
		8/16/2015	9:15:00 AM	9500	0.837	4.89	358	0.94	0.302	78	6.21	5.89	14.9	10000	15.9	13.3	338	0.0283	1.23	10.3	5.78	0.859	0.345	31.2	0.232	16.1	215		
		8/18/2015	9:56:00 AM	3640	0.201	2	121	0.244	ND	60.4	2.09	1.59	6.24	3300	4.3	10.9	126	0.01	1.37	2.63	3.06	0.638	0.042	29.8	ND	6.8	15.4		
		8/19/2015	9:30:00 AM	4070	0.162	2.14	122	0.244	ND	62.2	2.53	1.78	6.24	3520	4.16	10.5	127	ND	1.37	2.84	3.07	0.636	0.0495	29.2	ND	7.76	18		
		8/20/2015	9:44:00 AM	3650	0.164	2.02	119	0.266	ND	64.3	2.28	1.72	6.18	3290	3.84	11	119	ND	1.41	2.71	3.15	0.55	0.0385	32.5	ND	6.98	15.7		
		8/24/2015	3:10:00 PM	1780	0.165	1.97	89.6	0.11	ND	51.3	ND	0.797	3.5	1530	1.48	9.49	58.8	ND	1.44	1.49	2.91	0.569	ND	33.2	ND	4.6	8.33		
		8/25/2015	3:30:00 PM	1500	0.291	1.87	85.9	0.108	ND	50	ND	0.616	3.26	1310	1.22	9.32	49.8	ND	1.47	1.19	2.88	0.567	ND	32.9	ND	4.46	7.4		
		8/26/2015	2:50:00 PM	1540	0.642	1.59	82	0.102	ND	50.1	ND	0.588	3.23	1140	1.25	9.58	47.6	ND	1.79	1.37	2.93	0.566	0.0659	33.9	0.103	3.75	7.48		
		8/27/2015	3:40:00 PM	117000	0.0727	31.6	3010	16.3	3.49	307	65.7	78.6	164	116000	185	71.6	5570	0.468	1.08	105	22.9	2.24	1.14	53.4	1.16	124	564		
		8/28/2015	4:25:00 PM	196000	0.381	35.9	4030	20	3.49	262	98.5	116	264	164000	215	89.5	6630	0.588	0.508	147	33.2	2.14	1.58	95	1.58	154	674		
		9/23/2015	6:30:00 PM	5120	1.2	1.93	222	0.66	0.293	82.9	2.86	4.23	11.3	5250	10.8	15.6	407	ND	1.21	5.34	4.09	0.64	0.029	36.4	0.0444	10.9	37.9		
		10/2/2015	12:00:00 PM	183000	0.393	20.2	5400	17.3	5.24	424	123	148	333	178000	228	103	10800	1.06	0.519	204	33.3	1.88	6.71	59.9	2.44	178	862		
		10/15/2015		34400	0.771	9.94	751	2.55	1.01	181	22.6	22.3	59.5	38100	44	31.1	1280	0.147	0.922	73.7	9.22	0.976	0.365	41.4	0.683	49.7	176		
		10/18/2015		39000	0.26	10.3	971	2.88	1.23	212	27.4	27.8	65.3	44200	50.7	40.9	1660	0.1	0.974	44.4	10.3	0.992	0.375	46.7	0.87	57.2	197		
		10/19/2015		23900	0.257	7.35	533	1.56	0.64	131	16.8	14.6	39.1	25000	25.6	24.8	866	0.0683	1.06	24.1	7.7	0.924	0.244	44	0.465	37.3	109		
		10/19/2015	12:00:00 PM	166000	0.227	31.4	2120	15.5	5.96	737	88.9	104	201	163000	181	124	8110	0.915	1.42	168	32.4	2.35	1.29	185	2.59	149	742		
		10/20/2015	12:01:00 AM	202000	0.435	31.6	638	53.3	24.9	3230	73.7	254	194	44600	369	401	30300	1.59	0.303	368	48.5	3.71	4.87	377	1.22	31	1160		
		10/20/2015	12:00:00 PM	248000	0.29	34.1	1360	31.7	13.7	1590	116	162	244	181000	226	234	13300	1.34	0.626	281	42.4	3.12	3.12	202	2.59	128	1150		
		10/21/2015	12:00:01 AM	230000	0.435	33.9	3360	39.5	20.1	2040	104	212	296	114000	355	323	20400	1.62	0.411	375	38	3.9	4.29	103	1.62	76.3	1250		
		10/22/2015	12:00:00 PM	94800	0.132	25.3	3300	10.6	4.55	688	49.9	69.4	131	85200	155	126	6350	0.387	1.64	108	17.6	1.9	1.12	50.2	0.967	88.1	439		
		10/23/2015	12:00:10 AM	138000	0.115	25.6	4630	15.9	4.05	459	65.6	107	219	118000	200	88.9	7000	0.965	2.97	136	22.8	2.11	1.49	73.8	1.32	102	526		
		10/23/2015	12:00:00 PM	189000	0.233	34.6	6530	18.6	7.14	759	98	141	308	164000	283	153	11800	1.19	2.19	198	33.2	3.12	2.04	65.6	2.25	157	886		
		GK06	San Juan R @ McElmo Wash	9/23/2015	10:40:00 AM	3350	0.354	2.5	115	0.217	ND	175	1.99	1.51	4.25	3400	3.3	74.7	186	ND	2.67	4.49	5.51	0.613	ND	64.9	0.0303	6.86	14.5

Recreational Water Screening Values - Total Metals

		No Exceedence	Above Screening Level		Prior to Plume Arrival			Estimated Plume Arrival					Post Plume Arrival														
Monitoring Location	Site Description	Collection Date	Collection Time	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	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
		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	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L
4953990	San Juan R @ Town of Montezuma	8/8/2015	2:54:00 PM	67300	0.395	20.2	1590	6.36	2.49	390	38.8	41.1	82.4	50400	91.5	59.1	3010	0.222	1.3	75.8	17.7	1.93	0.655	51.7	1.18	82.8	286
		8/10/2015	10:13:00 AM	32300	0.216	11.5	1960	2.72	0.707	93.7	17.3	18.3	56.4	29700	79.3	20.1	1130	0.0717	0.834	23.5	7.45	0.901	0.519	34.6	0.283	43.8	821
		8/10/2015	2:58:00 PM	39100	0.228	11.8	1700	3.71	0.881	97.1	22.1	23.2	67.3	36800	75.8	22.5	1400	0.0983	0.93	29.6	8.49	1.08	0.747	34.9	0.438	4.9	658
		8/11/2015	9:44:00 AM	52800	0.296	12.6	918	4.27	0.998	99.7	23.1	25.1	67.9	40200	62.9	22.5	1410	0.122	0.753	29.3	9.63	1.2	0.803	36.9	0.672	55.2	186
		8/11/2015	2:20:00 PM	54700	0.232	15	1060	5.16	1.04	102	24.2	29.1	80.3	44700	70.2	24	1570	0.137	0.646	32.4	9.47	1.23	0.454	38.6	0.733	58.4	183
		8/12/2015	10:37:00 AM	31500	0.247	10.2	720	3.62	0.855	108	14.7	19.5	51.7	24400	49.1	18.4	1190	0.0783	0.45	22.7	7.04	1.06	0.481	33	0.458	38.6	131
		8/12/2015	2:57:00 PM	35000	0.272	10.7	725	3.97	0.916	130	17	19.5	51.4	26500	54.1	20.5	1120	0.112	0.397	27.7	8.29	1.12	0.305	34.5	0.561	40.8	144
		8/13/2015	4:46:00 PM	23700	0.156	10.1	722	3.57	0.708	127	9.33	17.3	47.9	17800	44.3	20.8	1270	0.103	0.681	19.3	6.73	0.948	0.312	34.2	0.324	34.2	109
		8/14/2015	9:55:00 AM	62000	0.443	16	1400	7.03	1.41	153	29.9	39.8	106	54300	90.8	32.9	2060	0.247	0.722	48.4	12.7	1.49	0.495	59.5	1.04	76.4	265
		8/15/2015	11:31:00 AM	29200	0.329	8.5	566	2.65	0.806	90.2	15.5	15	39.3	24900	36.5	19.7	862	0.075	1.06	18.7	7.88	0.928	0.245	39.4	0.397	43.3	114
		8/16/2015	10:02:00 AM	13600	0.232	5.56	517	1.15	0.305	78.8	7.56	7.12	21.1	13200	19.5	14.6	436	0.0333	1.04	10.1	7.25	0.861	0.158	39.3	0.219	21.6	238
		8/17/2015	4:07:00 PM	4160	0.35	2.63	141	0.408	0.254	65.6	2.42	1.87	6.89	3510	6.95	13.5	190	0.0117	1.5	3.06	3.63	0.656	0.114	31	0.14	8.04	20.2
		8/18/2015	8:41:00 AM	4450	0.783	2.73	131	0.387	ND	71.3	2.82	2.07	7.13	3920	5.96	14.4	162	0.0133	1.73	3.39	3.41	0.726	0.124	32.2	0.109	9.21	20.5
		8/19/2015	8:15:00 AM	4930	0.197	2.33	123	0.264	ND	71.4	2.38	1.64	5.96	3490	4.15	14.5	122	ND	1.62	2.78	3.31	0.603	0.0566	32.8	0.036	8.19	15.5
		8/20/2015	8:59:00 AM	3650	0.255	2.02	115	0.237	ND	69.1	2.29	1.4	5.58	3120	3.6	14.8	109	ND	1.56	2.46	3.25	0.595	0.0518	35.2	0.0315	7.12	13.9
		8/24/2015	4:30:00 PM	2170	0.217	2.02	96.4	0.141	ND	56	ND	0.896	3.77	1950	1.84	13.4	67.1	ND	1.57	1.83	3.19	0.555	ND	37.9	ND	5.65	10.6
		8/25/2015	4:20:00 PM	1500	0.32	1.82	91.8	0.102	ND	58.2	ND	0.674	3.26	1320	1.34	14	53.3	ND	1.67	1.43	3.07	0.555	ND	38.7	ND	5.08	8.98
		8/26/2015	3:30:00 PM	1250	0.198	1.55	91.5	0.115	ND	59.5	ND	0.654	3.24	978	1.5	14.7	61.2	ND	1.24	1.44	3.11	0.527	ND	38.8	0.0406	3.72	8.75
		8/27/2015	2:50:00 PM	22200	0.147	6.39	474	2.06	0.624	90	9.66	11.8	31.7	19200	27.8	22.3	1150	0.0463	0.817	15.2	7.16	0.731	0.19	37.9	0.0646	30.7	102
		8/28/2015	3:35:00 PM	191000	0.121	40.1	4520	22	4.59	369	93.8	11.9	232	173000	281	86.3	8390	0.678	0.656	141	31.9	2.48	1.84	64	1.42	167	1010
		9/22/2015	5:30:00 PM	1300	0.577	1.73	105	0.13	ND	70.1	ND	0.725	2.91	1290	1.77	17.5	62.2	ND	1.91	1.64	3.15	0.655	0.0768	40.3	0.0868	4.22	9.32
		10/2/2015	12:00:00 PM	14100	0.188	4.51	435	1.09	0.301	131	17.1	8.97	20.6	13800	16.5	26.1	606	0.0333	0.914	15	5.93	0.635	0.18	46.2	0.221	22.5	68.5
		10/15/2015	12:00:00 PM	14800	0.197	5.1	313	0.928	0.313	119	8.02	7.26	19.4	14700	15.5	27.4	417	0.025	0.996	12.2	5.89	0.685	0.0787	44.5	0.191	21.5	58.1
		10/19/2015	12:00:01 AM	5790	0.294	2.86	190	0.407	ND	106	3.47	3.2	9.21	5880	5.75	24.4	236	ND	1.44	6.04	4.47	0.736	0.083	44.4	0.148	10.2	26.3
		10/19/2015	12:00:00 PM	15200	0.197	5.39	320	1.04	0.372	145	6.4	7.72	18.8	11500	14.2	30.2	596	0.0263	0.909	11.6	6.69	0.762	0.0955	50.1	0.232	18.4	52.4
		10/20/2015	12:00:01 AM	53800	0.2	13.9	1250	5.05	1.64	264	20.7	25.8	57.7	42900	72.1	51.3	2000	0.222	0.6	41.2	13.3	1.55	0.422	64.2	0.339	45.4	175
		10/20/2015	12:00:00 PM	35800	0.195	11	881	3.13	1.3	244	17.2	18.3	44.3	29900	48	41.8	1340	0.2	0.904	34.2	12	1.66	0.334	62.6	0.691	39.4	134
		10/21/2015	12:00:01 AM	30200	0.188	10.1	689	2.45	0.758	213	11	13.6	32.6	21300	33	39.4	1210	0.19	0.745	20.8	10.9	1.29	0.188	68.1	0.46	31.3	89.1
		10/22/2015	12:00:00 PM	94300	0.175	25.4	2440	8.9	4.5	558	58	64.4	113	83900	140	108	4480	0.642	0.988	127	21.1	2.51	0.937	60.8	1.31	99.8	458
		10/23/2015	12:00:10 AM	273	0.633	10.6	4400	0.298	10.3	3810	ND	67.4	4.94	ND	1.17	17.8	23900	1.25	3.79	78.7	23.4	2.63	0.841	77.6	0.261	15.7	84.6
		10/23/2015	12:00:00 PM	223000	0.196	33.1	6480	20.2	8.36	965	111	150	245	165000	308	202	11900	0.857	1.23	231	36.7	2.66	1.91	85.6	2.24	138	924
		10/26/2015	2:00:00 PM	45800	0.105	10.5	771	2.66	0.785	149	24.9	21.3	54.9	42500	39.3	34.3	1120	0.0717	0.593	30.7	9.46	0.909	0.226	44.8	0.565	53.5	140
		8/8/2015	4:19:00 PM	55700	0.436	15.9	1090	5.21	1.99	252	32.4	34.3	80.8	47800	74.7	33.8	1700	0.158	1.75	65.8	13.3	2.14	0.633	58.8	1.29	64.7	242
		8/10/2015	11:15:00 AM	27000	0.3	13.2	1530	2.3	0.788	104	15.9	15.6	60	28500	140	21.2	1080	0.065	1.35	22.1	7.83	0.996	1.22	30.9	0.259	44.3	664
		8/10/2015	3:58:00 PM	28700	0.293	10.7	736	2.61	0.713	99.9	16.1	17.3	54.7	27700	84.7	20.4	1170	0.0733	0.876	22.3	7.29	0.894	0.527	33.2	0.245	40.9	960
		8/11/2015	10:53:00 AM	47800	0.218	11.5	913	3.87	1.01	98.9	21.7	22.6	61.6	37000	63.5	22.2	1310	0.113	0.711	27.7	9.34	0.863	0.44	36.4	0.579	52.7	167
		8/11/2015	3:01:00 PM	48700	0.272	12	900	4.23	1.04	102	21	23.6	64.2	36800	63.4	22.4	1400	0.115	0.855	28	9.46	1.1	0.436	39.2	0.615	51.5	163
		8/12/2015	11:12:00 AM	45400	0.202	14.9	971	5.16	0.94	109	20	27.9	76.7	34600	67.4	21.9	1670	0.128	0.344	30.3	8.43	1.1	0.363	38.4	0.565	51.4	176
		8/12/2015	5:06:00 PM	30600	0.259	10.3	718	3.61	0.712	90.9	13.6	19.2	53.4	23700	49.1	17.3	1190	0.08	0.515	21.7	6.84	0.923	0.486	33.2	0.411	38	126
		8/13/2015	11:28:00 AM	19300	0.215	8.77	661	2.52	0.744	168	8.79	13.6	33.6	12900	35.6	22.8	1190	0.06	0.862	18.8	6.83	1.11	0.451	31.6	0.294	32.9	92.7
8/14/2015	11:02:00 AM	66300	0.545	16.8	1460	7.48	1.4	148	29.8	41.8	116	58200	96	35.6	2160	0.27	0.621	49.2	12.5	1.56	0.574	55.7	1.1	77.4	288		
8/15/2015	10:30:00 AM	37600	0.394	11.2	826	4.1	0																				

Recreational Water Screening Values - Total Metals

No Exceedence		Above Screening Level				Prior to Plume Arrival				Estimated Plume Arrival						Post Plume Arrival											
		Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	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	mg/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L		
4953000	San Juan R @ Mexican Hat US163 Xing	8/8/2015	5:40:00 PM	63400	1.31	16.3	1540	7.23	1.5	167	29.4	41.5	103	51900	86.7	30.6	2800	0.18	1.3	47.8	14.4	1.43	0.56	63.9	0.838	70.5	261
		8/10/2015	11:53:00 AM	90800	0.171	20.6	2300	7.61	1.53	314	43.1	40.2	72.8	43400	82.1	57	3230	0.142	0.65	70.9	19.7	1.37	0.401	46.1	0.616	80	843
		8/10/2015	4:44:00 PM	80600	0.316	22.7	1910	6.12	1.27	254	36.8	32.8	69.8	38100	171	49.4	2430	0.133	0.674	58.4	18.1	1.28	1.1	52.6	0.442	83.3	815
		8/11/2015	11:31:00 AM	111000	0.193	22.2	2430	8.13	1.39	259	43.5	38.5	74.3	47300	102	57.4	2710	0.175	0.584	64.6	22.2	1.25	0.592	57.8	0.828	88.4	209
		8/11/2015	3:43:00 PM	56400	0.345	13.3	1360	5.09	1.09	150	23.5	25.3	61	35900	75.1	30.1	1660	0.13	0.774	34.2	11.7	0.925	0.475	41.6	0.59	57.2	168
		8/12/2015	12:09:00 PM	54700	0.775	17.5	1350	6.77	1.17	186	23.2	33.2	80.8	37600	82.9	33.3	2170	0.143	0.312	36.9	10.7	1.22	0.488	44.4	0.604	63.7	190
		8/12/2015	5:50:00 PM	71400	0.224	22.7	2010	8.74	1.55	262	26.5	40.1	82.4	36600	101	47.9	3070	0.18	0.234	51.7	14	1.53	0.539	55.6	0.632	78.5	210
		8/13/2015	12:05:00 PM	44700	1.9	16.5	1450	5.44	1.25	246	18.3	25	49.5	21600	62.5	41.9	1840	0.127	0.677	39.2	12.5	1.59	0.523	48.8	0.432	66.1	145
		8/14/2015	11:43:00 AM	124000	1.14	37.2	4320	15.2	3.74	720	51.1	59.6	84.2	46900	166	105	5630	0.372	0.919	111	30.4	2.41	1.11	78.6	0.988	115	270
		8/15/2015	9:43:00 AM	63700	1.16	16.8	1620	7.29	1.46	207	29.8	35.5	79	45100	86.7	40.7	2330	0.198	0.957	47.8	14	1.57	0.631	59.6	0.862	75.5	220
		8/16/2015	11:58:00 AM	34300	0.18	9.96	892	2.87	0.6	111	17.1	16.3	40.2	25600	39.4	22.6	976	0.0767	0.785	24	10.6	0.97	0.186	47.6	0.415	40.5	294
		8/17/2015	3:04:00 PM	16800	0.698	6.85	496	2.07	0.429	92.3	8.24	9.82	24.3	13900	27.1	18	641	0.0633	1.06	14.1	6.41	0.975	0.328	38.4	0.261	26.2	72.6
		8/18/2015	11:55:00 AM	17400	1.19	5.37	281	1.19	0.243	86.9	9.97	6.33	16.3	13000	14.7	18	373	0.025	1.42	12.1	6.27	0.889	0.163	32.8	0.181	25.4	55.4
		8/19/2015	1:03:00 PM	7110	0.209	3.13	187	0.457	ND	74.5	3.83	2.66	8.51	5210	7.15	15.2	182	ND	1.49	4.81	4.09	0.694	0.0541	33.5	0.0502	12	23
		8/20/2015	6:56:00 PM	5790	0.198	2.92	161	0.342	ND	73.2	3.08	1.99	6.84	4330	5.17	14.6	136	ND	1.63	3.24	3.78	0.631	0.0482	34.8	0.0372	10.4	18.7
		8/24/2015	1:10:00 PM	3410	0.153	2.35	132	0.242	ND	62.9	1.69	1.26	4.99	3280	3.02	14	90.2	ND	1.57	2.18	3.49	0.611	ND	38.2	ND	7.37	15.6
		8/25/2015	1:40:00 PM	2690	0.233	2.48	122	0.161	ND	60.9	1.77	1.11	4.42	2390	2.39	13.8	74.4	ND	1.71	1.93	3.47	0.644	ND	40	ND	7.26	12
		8/26/2015	1:00:00 PM	2190	0.609	1.95	107	0.142	ND	59.5	ND	0.774	3.71	1520	1.75	13.8	58	ND	1.89	1.67	3.35	0.544	0.0824	39.0	0.0501	5.48	9.06
		8/27/2015	1:15:00 PM	2860	0.129	2.35	117	0.223	ND	70.4	2.49	1.46	4.07	2040	2.27	15.7	102	ND	1.57	3.34	3.67	0.488	ND	37.9	ND	9.11	11
		8/28/2015	2:00:00 PM	163000	0.203	45	4610	14	6.26	1070	104	84.5	136	110000	200	186	7390	0.368	0.841	184	36.2	5.66	1.51	82.3	1.56	141	588
		9/22/2015	9:56:00 AM	2530	0.82	2.32	140	0.216	ND	76.6	1.92	1.31	4.3	2470	2.99	19.3	90.5	ND	1.78	2.64	3.65	0.837	0.0704	44	0.0794	6.68	14.1
				3480	0.274	2.57	149	0.202	ND	78.7	2.05	1.45	5.61	3280	3.35	21.9	97.3	ND	1.66	3.03	4.26	0.745	ND	41.6	ND	7.63	16.8
		10/2/2015	12:00:00 PM	4550	1.08	2.34	188	0.308	ND	111	3.19	1.88	6.82	3910	3.55	18	95.5	0.0533	1.53	5.2	4.38	0.686	0.202	45.3	0.0565	8.16	15.8
		10/15/2015		40800	0.857	12.3	1150	3.05	1.17	261	28.7	27.4	56.3	46300	46.1	51.1	1720	0.165	1.13	44.6	12.8	0.931	0.287	49.7	0.797	58.6	191
		10/23/2015	12:00:10 AM	38100	0.873	11.3	1230	2.86	1.19	260	20.8	17.7	29.8	20800	37	53.4	1300	0.72	1.32	38.1	12.4	2.62	0.264	71	0.377	47.2	113
		10/23/2015	12:00:00 PM	74700	0.15	17.8	2270	6.2	1.56	317	32.4	33	46.2	29400	67.8	77.3	2760	0.335	0.834	62.7	17.8	1.68	0.414	74.1	0.462	61.1	169
		10/24/2015	12:00:10 AM	118000	0.146	25.9	3850	12.7	2.47	405	44	55.3	81	50400	130	87.7	4610	0.393	0.415	91.4	24.2	1.62	0.774	82.9	0.654	79.7	240
		10/26/2015	4:15:00 PM	43700	0.119	9.92	676	2.6	0.751	131	23.9	20.4	56.6	39800	39.2	28	1060	0.0717	0.747	28.8	9.06	1.02	0.287	46	0.612	51.8	140
8/13/2015	2:42:00 PM	42900	0.144	18.4	1760	7.39	1.47	355	15.6	32.3	68.8	23000	83.4	49.7	2960	0.185	0.56	35.7	11.5	1.39	0.491	52	0.407	64.3	162		
8/14/2015	2:33:00 PM	73900	0.377	21.7	2040	7.21	2.22	422	33.8	35.1	59.7	34700	89.2	63.4	2900	0.168	1.03	62.9	17.3	1.82	0.664	59.7	0.67	84.5	198		
8/15/2015	2:30:00 PM	154000	0.281	36.6	4170	16.6	2.88	960	55.3	63.1	93.2	54000	175	110	5740	0.33	0.734	110	33	2.38	0.923	82.9	1.01	116	294		
8/16/2015	2:46:00 PM	91000	0.175	22	2250	8.19	1.52	253	40.5	45.4	104	64900	105	53.5	2850	0.228	0.623	65.8	19.5	1.88	0.482	63.3	1.12	89.8	477		
8/17/2015	1:03:00 PM	26300	0.544	9.76	920	3.44	0.737	132	11.3	16.2	39.4	18300	43.8	24.3	1240	0.0983	1.04	20.8	8.96	1.11	0.542	48.6	0.407	40.7	105		
8/18/2015	1:45:00 PM	29300	0.307	7.82	570	2.08	0.45	113	15.3	12.6	31	22200	29.5	21.9	749	0.06	0.684	19.9	8.01	0.852	0.152	36.4	0.295	40	92.6		
8/19/2015	3:09:00 PM	24000	0.159	7.46	437	1.54	0.361	110	14.2	9.37	23.8	16600	22.4	20.2	547	0.0333	0.977	18.2	7.37	0.751	0.124	34	0.271	34.3	76.9		
8/24/2015	10:37:00 AM	5130	0.451	3.03	176	0.304	ND	68.7	2.74	1.83	6.4	3860	4.08	14.3	130	ND	1.56	3.23	3.96	0.605	0.0365	38.5	0.0428	11.1	19		
8/25/2015	11:15:00 AM	4870	0.218	2.83	188	0.323	ND	70.6	2.85	1.93	6.4	3860	4.14	14.9	139	ND	1.6	3.66	3.98	0.623	0.0259	40.1	ND	11.1	18.6		
8/26/2015	10:05:00 AM	5170	0.254	3.33	186	0.368	ND	66.6	2.73	1.85	6.26	3770	4.23	14.7	131	ND	1.65	3.31	4.01	0.697	0.0312	40.6	ND	11.4	18.6		
8/27/2015	10:35:00 AM	61300	0.0946	20.9	2110	7.34	1.71	652	36.3	40.5	38.7	24100	66.7	115	3310	0.143	ND	81.9	22.8	1.33	0.229	50.5	0.212	99.3	159		
8/28/2015	10:25:00 AM	64800	0.132	22.8	1880	6	2.38	961	47.4	35.6	35.8	23400	61.8	125	2930	0.202	0.562	85.9	21.5	2.14	0.242	69.4	0.155	90.4	171		
9/23/2015	1:45:00 PM	6800	0.537	3.21	239	0.421	ND	92.5	3.83	2.51	11.2	5520	5.98	21.8	156	ND	1.71	6.48	4.8	0.748	0.0669	43.4	0.0761	13.1	24.6		
10/2/2015		33000	0.266	6.7	587	2.43	0.55	115	21.6	17.1	46.7	28800	28.7	23.1	898	0.07	0.555	24.6	8.67	0.855	0.207	49.6	0.40				

Agricultural Screening Values – Dissolved Metals

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. These comparisons show exceedances of the screening values for dissolved aluminum, iron, and manganese only on August 28, 2015 and only at the sample site upstream of the Utah State line. Results from the Utah sites are below the screening values for metals and metalloids. The Utah agricultural water quality standard for total dissolved solids was exceeded on one day at Mexican Hat and two days at the Clay Hills sample site. Total dissolved solids are concluded to be unrelated to the release of Gold King mine wastes because the concentrations are lower at the sample site upstream of the Utah State line. 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.

		No Exceedence		Above Screening Level				Prior to Plume Arrival				Estimated Plume Arrival				Post Plume Arrival														
				Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Sulfate	Thallium	Total Dissolved Solids	Vanadium	Zinc	
Livestock Water		5,000				200			50	500	1000	1000	500		100	250,000		10				50		1,000,000			1200	100	25000	
Irrigation Water Short-term NAS, 1972		20,000				2000			50		1000	5000	5000	20000	10000		10000		50	2000		20						1000	10000	
Irrigation Water Long-term NAS, 1972		5,000				100			10		100	50	200	5,000	5,000				10	200		20						100	2,000	
Utah DWQ Agricultural Use Criteria 4						100			10		100		200		100							50						1200		
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	mg/L	ug/L	ug/L	mg/L	mg/L	ug/L	mg/L	ug/L	ug/L	ug/L	
4954000	San Juan R @ US160 Xing in CO	8/8/2015	1:23:00 PM	217	0.524	1.34	222	0.0369	ND	51.5	ND	0.127	2.24	95.8	ND	7.85	2.94	ND	1.87	ND	2.96	0.722	ND	32.2	111	ND	460	4.86	15.3	
		8/9/2015	12:02:00 PM	258	0.341	0.628	274	ND	ND	50.6	ND	0.0817	2.48	119	ND	6.86	2.69	ND	2.01	ND	2.61	0.563	0.0257	28.5	120	ND	400	1.76	18.5	
		8/9/2015	3:05:00 PM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		8/9/2015	6:00:00 PM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		8/9/2015	9:02:00 PM	329	0.347	0.946	341	0.0356	ND	46	ND	0.139	3.47	198	0.274	6.3	4.14	ND	1.94	ND	2.38	0.535	ND	30	97.3	ND	430	2.07	15.4	
		8/10/2015	9:11:00 AM	172	0.458	0.994	233	ND	ND	44.6	ND	0.0673	3.21	103	0.391	6.01	1.64	ND	2.03	ND	2.51	0.582	ND	34.1	99.7	ND	380	1.74	19.7	
		8/10/2015	2:06:00 PM	1050	0.711	1.3	220	0.0905	ND	44.2	ND	0.407	3.35	732	1.04	6.02	12.8	ND	1.92	0.838	2.72	0.645	0.0586	35.1	102	ND	490	3.64	18	
		8/11/2015	8:50:00 AM	3290	0.364	1.72	451	0.102	ND	39.8	ND	0.488	4.85	1520	1.1	5.05	19	0.015	1.65	1.19	3	0.972	ND	43.7	100	ND	380	3.9	19.1	
		8/11/2015	1:17:00 PM	720	0.0516	1.33	334	ND	ND	41.7	ND	0.155	3.03	366	0.27	5.11	5.1	ND	1.58	ND	2.91	0.76	ND	37	99.2	ND	290	2.46	14.9	
		8/12/2015	9:50:00 AM	104	0.586	0.879	178	ND	ND	52.1	ND	0.0614	2.39	ND	ND	7.2	ND	ND	1.47	ND	2.79	0.782	0.0252	30.3	118	ND	620	1.9	14.8	
		8/12/2015	2:04:00 PM	155	0.548	1.21	151	ND	ND	47.9	ND	0.0478	2.61	ND	ND	6.97	1.82	ND	1.48	ND	2.74	0.728	ND	27.3	102	ND	450	2.87	16.5	
		8/13/2015	10:01:00 AM	257	0.158	1.25	213	0.0299	ND	48.3	ND	0.122	3.67	148	0.373	6.48	3.16	ND	1.89	ND	2.87	0.858	ND	42.5	121	ND	450	2.1	21.9	
		8/14/2015	2:33:00 PM	64.8	0.421	1.7	72.3	0.0382	ND	53.4	ND	0.133	3.86	ND	ND	6.61	1.8	ND	3.65	3.14	3.66	1.1	ND	52.4	135	0.0385	720	4.11	ND	
		8/15/2015	12:04:00 PM	47.5	0.445	1.36	65.2	ND	ND	52.8	ND	0.052	1.35	ND	ND	7.91	ND	ND	2.25	ND	2.61	0.608	ND	25.9	106	ND	580	2.61	ND	
		8/16/2015	9:15:00 AM	54.4	1.12	0.88	179	0.041	ND	53.9	ND	ND	2.91	ND	ND	8.18	ND	ND	1.72	ND	2.54	0.595	0.186	26.1	118	ND	980	1.92	12.6	
		8/18/2015	9:56:00 AM	23.9	0.689	1.31	148	ND	ND	57.5	ND	0.0869	2.27	ND	0.287	9.82	ND	ND	1.74	ND	2.5	0.585	0.0393	33.4	111	ND	220	1.88	12.3	
		8/19/2015	9:30:00 AM	ND	0.682	1.34	106	ND	ND	57.1	ND	0.0697	1.7	ND	ND	9.98	ND	ND	1.72	ND	2.54	0.538	0.0291	34.1	110	ND	280	1.91	8.44	
		8/20/2015	9:44:00 AM	28.4	0.764	1.32	132	ND	ND	57	ND	0.0772	1.85	ND	ND	9.55	ND	ND	1.76	ND	2.44	0.631	0.104	33.8	111	0.0365	930	1.93	8.1	
		8/24/2015	3:10:00 PM	ND	0.273	1.36	62.4	ND	ND	50	ND	0.048	2.18	ND	ND	8.95	1.92	ND	1.56	1.08	2.64	0.538	ND	32.6	101	ND	280	2.31	5.49	
		8/25/2015	3:30:00 PM	ND	0.481	1.42	63.4	ND	ND	47.8	ND	ND	2.11	ND	ND	8.74	1.88	ND	1.58	ND	2.52	0.579	ND	31.8	98	ND	284	2.52	ND	
		8/26/2015	2:50:00 PM	760	0.563	1.47	70.5	0.0621	ND	47.5	ND	0.308	2.75	554	0.459	8.82	21.8	ND	1.57	1.05	2.61	0.622	0.07	32.2	100	0.0304	288	3.29	8	
8/27/2015	3:40:00 PM	798	0.335	1.01	121	0.0635	ND	65.9	ND	0.383	3.3	605	0.527	10.2	11.4	ND	3.32	2.04	4.58	0.943	ND	49.2	181	ND	440	3.41	6.22			
8/28/2015	4:25:00 PM	20700	0.249	5.55	340	1.58	0.261	59.4	12	9.01	27.7	16700	15.7	10	413	0.0383	1.45	12.7	7.89	0.821	0.0852	89.6	220	0.18	530	26.2	72.8			
9/23/2015	6:30:00 PM	ND	0.724	0.985	81.5	0.105	ND	60.8	ND	0.253	1.88	ND	ND	10.9	9.31	ND	1.82	1.31	2.87	0.666	0.132	35	NS	0.115	NS	1.84	ND			
10/15/2015	12:00:01 AM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS		
GK06	San Juan R @ McElmo Wash	9/23/2015	10:40:00 AM	28.8	0.402	1.1	60.6	ND	ND	165	ND	0.165	1.11	ND	ND	73.6	2.44	0.0233	2.59	2.01	4.49	0.631	0.0256	65.4	NS	ND	NS	1.43	ND	

Agricultural Screening Values – Dissolved Metals

		No Exceedence		Above Screening Level						Prior to Plume Arrival				Estimated Plume Arrival				Post Plume Arrival														
Monitoring Location	Site Description	Collection Date	Collection Time	Aluminum		Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Sulfate	Thallium	Total Dissolved Solids	Vanadium	Zinc		
				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	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Livestock Water				5,000			200			50	500	1000	1000	500		100	250,000		10				50		1,000,000			1200	100	25000		
Irrigation Water Short-term NAS, 1972				20,000			2000			50		1000	5000	5000	20000	10000		10000		50	2000		20						1000	10000		
Irrigation Water Long-term NAS, 1972				5,000			100			10		100	50	200	5,000	5,000		200		10	200		20							500000	100	2,000
Utah DWQ Agricultural Use Criteria 4							100			10		100		200	100								50						1200			
4953990	San Juan R @ Town of Montezuma	8/8/2015	2:54:00 PM	136	0.747	1.06	223	0.0395	ND	71.5	ND	0.13	2.72	ND	ND	9.92	ND	ND	2.62	0.804	3.84	1.11	0.0412	43.5	195	ND	610	2.54	21			
		8/10/2015	10:13:00 AM	218	0.66	0.941	262	ND	ND	49.8	ND	0.0764	3.24	144	0.461	7.7	3.22	ND	2.03	ND	2.69	0.567	0.0529	32.1	115	ND	610	2.13	17.3			
		8/10/2015	2:58:00 PM	94.5	1.31	0.933	200	0.0336	ND	48.6	ND	0.0595	2.48	ND	0.297	7.35	ND	ND	2.32	ND	2.59	0.609	0.251	31.8	108	ND	460	1.96	14.6			
		8/11/2015	9:44:00 AM	462	0.568	1.17	314	ND	ND	44.6	ND	0.127	2.66	227	ND	6.49	3.31	ND	1.72	ND	2.64	0.678	0.0307	37.1	110	ND	460	2.21	12.9			
		8/11/2015	2:20:00 PM	1400	0.136	1.25	298	0.0423	ND	44.8	ND	0.24	3.47	668	0.489	6.57	9.99	ND	1.72	0.952	2.96	0.741	ND	38.3	110	ND	620	2.73	14.3			
		8/12/2015	10:37:00 AM	67.5	0.799	1.1	202	0.0304	ND	48.3	ND	ND	2.49	ND	ND	7.23	ND	ND	1.66	ND	2.67	0.798	0.0397	31.9	114	ND	560	1.68	13.5			
		8/12/2015	2:57:00 PM	375	0.822	0.912	176	ND	ND	48.9	ND	0.0898	4.34	296	ND	7.5	2.28	ND	1.64	ND	2.84	0.716	0.0343	33.8	123	ND	460	1.99	15.9			
		8/13/2015	4:46:00 PM	330	1.88	1.28	240	0.0654	ND	49.4	ND	0.18	3.75	192	ND	8.08	5.3	ND	1.91	0.984	2.62	0.978	0.235	32.9	125	0.025	370	3.12	32.7			
		8/14/2015	9:55:00 AM	24.8	0.582	1.27	85.1	0.0403	ND	55.1	ND	0.146	3.79	ND	ND	7.81	ND	ND	2.84	1.76	3.51	0.989	0.0355	53	154	0.0272	480	3.07	ND			
		8/15/2015	11:31:00 AM	68.1	0.642	1.58	73.6	0.0432	ND	55.1	ND	0.244	4.38	ND	ND	8.57	3.36	ND	2.43	1.09	3.16	0.888	0.0705	35.8	139	ND	440	3.54	ND			
		8/16/2015	10:02:00 AM	61.8	0.835	1.17	145	0.0638	ND	57.5	ND	0.092	3.01	ND	ND	9.36	ND	ND	1.99	ND	2.96	0.667	0.283	30.3	128	0.0527	1170	2.16	9.78			
		8/17/2015	4:07:00 PM	27.3	0.285	1.17	80.4	ND	ND	60.2	ND	0.137	1.87	ND	ND	11.6	2.4	ND	1.97	ND	2.82	0.63	ND	29.4	150	ND	790	2.18	ND			
		8/18/2015	8:41:00 AM	24.6	1.02	1.19	197	0.0327	ND	62.7	ND	0.0974	3.44	ND	0.316	12.7	ND	ND	2.07	ND	2.64	0.629	0.136	35.4	134	0.0785	280	2.29	14.8			
		8/19/2015	8:15:00 AM	ND	0.947	1.22	141	ND	ND	63.1	ND	0.0794	1.67	ND	ND	13.7	ND	ND	1.99	ND	2.67	0.648	0.0967	37.7	139	0.0349	310	2.3	9.64			
		8/20/2015	8:59:00 AM	ND	0.994	1.4	128	ND	ND	62.7	ND	0.071	1.93	ND	ND	13.4	ND	ND	1.8	ND	2.62	0.66	ND	37.5	134	ND	370	2.14	6.64			
		8/24/2015	4:30:00 PM	126	0.284	1.38	67.8	ND	ND	55.9	ND	0.0989	2.31	ND	ND	12.8	4.86	ND	1.71	0.762	2.84	0.601	ND	38.4	127	ND	364	2.93	ND			
		8/25/2015	4:20:00 PM	ND	0.278	1.26	68.2	ND	ND	55.9	ND	0.0799	2.63	ND	ND	13.2	2.03	ND	1.8	0.934	2.71	0.589	ND	37.6	130	ND	332	2.71	10			
		8/26/2015	3:30:00 PM	818	0.429	1.46	77.1	0.0556	ND	57.6	ND	0.295	2.93	601	0.49	14.3	26.5	ND	1.76	1.13	2.96	0.636	ND	38.4	133	ND	340	3.76	5.37			
		8/27/2015	2:50:00 PM	139	0.355	1.4	71.1	ND	ND	47.9	ND	0.188	2.06	ND	ND	10.4	3.95	ND	2.09	ND	2.76	0.711	ND	36.6	117	ND	250	2.67	ND			
		8/28/2015	3:35:00 PM	487	0.321	1.09	161	0.0427	ND	95	ND	0.316	4.04	414	0.368	11.4	11.5	ND	2.67	1.62	6.46	0.793	ND	60.3	299	ND	610	2.78	191			
		9/22/2015	5:30:00 PM	ND	0.265	1.3	75	ND	ND	70.3	ND	0.103	3.28	ND	ND	17.4	1.73	ND	1.75	1.42	2.92	0.574	ND	41.4	NS	NS	NS	2.83	5.88			
		10/15/2015	12:00:01 AM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
		10/26/2015	2:00:00 PM	ND	0.946	1.03	109	ND	ND	74.9	ND	0.557	1.3	ND	ND	15.2	2.03	ND	1.8	0.756	3.25	0.6	ND	41	183	ND	NS	1.86	ND	NS		
		8/8/2015	4:19:00 PM	214	1.38	1.03	294	0.0574	ND	73.7	ND	0.124	3.86	104	ND	9.24	2.55	ND	3.3	1.01	4.11	1.43	0.123	51.2	226	ND	640	2.22	19			
		8/10/2015	11:15:00 AM	124	1.24	0.878	192	ND	ND	53.2	ND	0.0685	2.07	ND	0.287	8.4	ND	ND	2.38	ND	2.86	0.692	0.252	28.4	124	ND	370	1.75	13.7			
		8/10/2015	3:58:00 PM	108	0.574	1.07	184	ND	ND	48.4	ND	0.0556	1.96	ND	0.315	7.83	ND	ND	2.26	ND	2.67	0.526	ND	30.6	118	ND	490	1.89	13.2			
		8/11/2015	10:53:00 AM	684	1.18	1.23	278	0.059	ND	45.8	ND	0.172	2.87	328	ND	6.93	4.12	ND	1.92	0.778	2.72	0.685	0.269	36.8	114	0.031	390	2.55	13.7			
		8/11/2015	3:01:00 PM	158	0.271	1.01	251	ND	ND	45.3	ND	0.0864	2.69	89.2	ND	6.65	ND	ND	1.85	ND	2.76	0.673	ND	36.6	112	ND	360	2.05	14.9			
8/12/2015	11:12:00 AM	623	1.08	1.41	205	0.0499	ND	46.8	ND	0.154	3.44	310	ND	6.98	4.47	ND	1.93	ND	2.91	0.793	0.0594	37.8	112	ND	450	2.61	14.5					
8/12/2015	5:06:00 PM	605	1.78	1.43	260	0.0633	ND	46.6	ND	0.162	2.98	314	ND	7.07	5.16	ND	1.81	0.913	2.79	0.781	0.152	33.5	109	ND	410	2.32	13.2					
8/13/2015	11:28:00 AM	509	0.667	1.3	156	0.0326	ND	53.6	ND	0.21	3.1	275	ND	8.21	8.9	ND	1.62	ND	2.96	0.68	ND	29.2	121	ND	450	3.65	20.4					
8/14/2015	11:02:00 AM	ND	1.03	2.03	78.6	0.0535	ND	53.2	ND	0.131	3.31	ND	ND	8.26	7.02	ND	5.31	2.38	3.27	1.08	0.193	49.5	146	0.129	630	5.88	4.87					
8/15/2015	10:30:00 AM	95.2	1.12	1.84	83.5	0.0411	ND	55.7	ND	0.085	2.27	ND	ND	8.4	ND	ND	3.93	0.816	3.46	1.06	0.276	46.7	164	0.0523	540	3.45	ND					
8/16/2015	11:06:00 AM	290	0.425	1.23	149	0.0361	ND	55.8	ND	0.146	3.89	202	ND	10.2	3.94	ND	1.95	ND	2.91	0.707	0.0426	36.3	136	ND	1020	2.04	10.5					
8/17/2015	3:33:00 PM	ND	0.408	1.48	87.1	ND	ND	62.4	ND	0.172	2.11	ND	ND	11.2	ND	ND	2.67	1.28	3.13	0.626	ND	30	148	ND	930	2.75	ND					
8/18/2015	11:22:00 AM	ND	0.583	1.46	138	ND	ND	66.4	ND	0.0643	2.25	ND	0.382	12.8	1.55	ND	1.94	ND	2.92	0.57	ND	36	138	ND	260	2.38	12.3					
8/19/2015	12:33:00 PM	32.9	0.513	1.32	122	ND	ND	64.5	ND	0.0747	1.91	ND	ND	12.9	1.79	ND	1.96	ND	2.75	0.564	ND	36.1	137	ND	340	2.46	8.68					
8/20/2015	7:21:00 AM	24.4	0.341	1.42	138	ND	ND	61.2	ND	0.0766	2.33	ND	ND	12.4	ND	ND	1.86	ND	2.6	0.617	ND	36.1	132	ND	330	2.61	9.07					
8/24/2015	1:55:00 PM	410	0.331	1.56	79.6	ND	ND	57.5	ND	0.136	2.76	265	ND	12.8	9.36	ND	1.78	0.886	2.86	0.581	ND	38.6	128	ND	344	3.76	6.39					
8/25/2015	2:25:00 PM	ND	0.289	1.48	77.5	ND																										

Agricultural Screening Values – Dissolved Metals

		No Exceedence	Above Screening Level					Prior to Plume Arrival					Estimated Plume Arrival					Post Plume Arrival													
Monitoring Location	Site Description	Collection Date	Collection Time	Aluminum		Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Potassium	Selenium	Silver	Sodium	Sulfate	Thallium	Total Dissolved Solids	Vanadium	Zinc	
				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	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	mg/L	ug/L	mg/L	mg/L	ug/L	ug/L
Livestock Water		5,000		200					50	500	1000	1000	500		100	250,000		10					50		1,000,000			1200	100	25000	
Irrigation Water Short-term NAS, 1972		20,000		2000					50		1000	5000	5000	20000	10000		10000			50	2000		20						1000	10000	
Irrigation Water Long-term NAS, 1972		5,000		100					10		100	50	200	5,000	5,000		200			10	200		20						100	2,000	
Utah DWQ Agricultural Use Criteria 4				100					10		100		200		100								50						1200		
4953000	San Juan R @ Mexican Hat US163 Xing	8/8/2015	5:40:00 PM	264	1.38	1.57	308	0.0435	ND	49.2	ND	0.127	3.95	144	ND	5.75	2.81	ND	3.15	0.885	4.15	0.924	0.0956	62.6	154	ND	730	3.13	14.2		
		8/10/2015	11:53:00 AM	325	0.376	1.94	299	ND	ND	44.6	ND	0.102	2.95	140	0.315	7.84	2.55	ND	2.43	ND	3.41	0.606	0.0297	43.6	126	ND	590	7.59	17.6		
		8/10/2015	4:44:00 PM	149	1.26	1.4	265	ND	ND	44.2	ND	0.0789	2.48	ND	0.315	7.87	ND	ND	2.63	ND	3.35	0.753	0.193	41.9	132	ND	660	6.67	18.5		
		8/11/2015	11:31:00 AM	907	1.42	1.98	391	0.0491	ND	37.2	ND	0.179	3.13	382	ND	6.72	4.55	ND	2.46	0.847	3.29	0.775	0.205	51.3	117	0.0362	980	7.82	12.4		
		8/11/2015	3:43:00 PM	1790	1.23	1.59	445	0.0695	ND	43.6	ND	0.311	5.28	787	0.569	7.19	11.6	ND	1.98	1.02	3.11	0.821	0.23	41.4	129	0.027	600	4.55	17.4		
		8/12/2015	12:09:00 PM	125	1.41	1.59	245	0.0328	ND	59.8	ND	0.0512	3.34	ND	ND	7.86	ND	ND	2.27	ND	3.09	0.923	0.151	42.1	157	ND	450	3.07	14.2		
		8/12/2015	5:50:00 PM	105	2.23	1.79	185	0.0863	ND	48.9	ND	0.0691	3.19	ND	ND	7.22	ND	ND	2.64	ND	3.16	1.16	0.264	48.7	143	ND	470	4.34	16.1		
		8/13/2015	12:05:00 PM	293	1.61	2.06	201	ND	ND	42.6	ND	0.148	3.46	143	ND	7.21	3.54	ND	2.33	0.764	3.3	1.18	0.182	44.4	135	ND	490	7.13	19.8		
		8/14/2015	11:43:00 AM	120	1.04	2.33	157	0.0429	ND	46.2	ND	0.236	5.86	ND	ND	10.5	2.43	ND	5.87	1.75	4.29	1.56	0.152	68	173	0.182	760	8.06	ND		
		8/15/2015	9:43:00 AM	135	1.04	1.7	117	0.032	ND	53.7	ND	0.575	8.56	ND	ND	9.03	7.42	ND	3.28	1.66	3.62	1.19	0.192	51.9	191	0.0557	710	5.65	6.18		
		8/16/2015	11:58:00 AM	84.3	0.447	1.35	194	0.03	ND	57.7	ND	0.12	3.92	ND	ND	8.96	ND	ND	2.31	ND	3.5	0.836	0.0298	40.2	136	ND	1380	3.31	13.8		
		8/17/2015	3:04:00 PM	52.3	0.817	1.55	108	ND	ND	59.3	ND	0.128	2.85	ND	ND	10.3	ND	ND	2.55	1.23	3.42	0.859	0.186	37.3	142	0.0425	880	3.4	ND		
		8/18/2015	11:55:00 AM	123	1.59	1.42	258	ND	ND	65.3	ND	0.137	3.05	ND	0.503	11.9	3.96	ND	2.09	ND	3.05	0.603	0.0934	35.8	143	0.0402	320	2.97	20.4		
		8/19/2015	1:03:00 PM	83.3	0.427	1.45	219	ND	ND	65.7	ND	0.0987	2.86	ND	0.311	12.8	3.51	ND	2.02	ND	2.96	0.677	ND	38.4	140	ND	350	3.2	9.29		
		8/20/2015	6:56:00 AM	50.4	0.353	1.42	200	ND	ND	66.4	ND	0.0685	2.19	ND	ND	12.6	ND	ND	1.98	ND	2.79	0.598	ND	36.9	142	ND	320	2.98	8.35		
		8/24/2015	1:10:00 PM	39.9	0.387	1.53	87.4	ND	ND	61	ND	0.0534	1.89	ND	ND	13.6	1.59	ND	1.92	ND	2.95	0.653	0.0336	39.8	130	ND	456	3.29	4.78		
		8/25/2015	1:40:00 PM	308	0.286	1.48	82.3	ND	ND	57.6	ND	0.137	2.55	185	0.4	12.7	6.37	ND	1.73	ND	2.87	0.577	ND	38.4	132	ND	336	3.84	6.19		
		8/26/2015	1:00:00 PM	ND	0.292	1.5	81	ND	ND	56.2	ND	0.0589	2.36	ND	ND	12.6	ND	ND	1.86	ND	2.77	0.635	ND	37.6	132	ND	356	3.34	ND		
		8/27/2015	1:15:00 PM	386	0.606	1.6	83.3	0.043	ND	56.9	ND	0.216	2.53	222	0.274	12.9	11.3	ND	2.11	1.51	2.99	0.757	0.0697	37.2	143	0.0662	300	4.17	6.73		
		8/28/2015	2:00:00 PM	ND	0.635	1.2	186	ND	ND	73.3	ND	0.103	2.86	ND	ND	15.9	ND	ND	4.12	1.96	5.1	2.91	ND	70.9	262	ND	730	4.45	ND		
		9/22/2015	9:56:00 AM	ND	0.354	1.39	90.1	ND	ND	74.2	ND	0.0835	2.08	ND	0.455	18.3	ND	ND	1.79	ND	3.11	0.699	0.027	43.4	NS	NS	NS	3.31	ND		
		10/15/2015	12:00:10 AM	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	202	NS	900	NS	NS
		10/26/2015	4:15:00 PM	ND	0.597	1.1	114	0.0329	ND	79.7	ND	0.154	1.27	ND	ND	15	ND	ND	1.88	ND	3.48	0.75	0.0517	44	187	0.0293	NS	2.53	ND		
		4952940	San Juan R @ Clay Hills	8/13/2015	2:42:00 PM	643	0.18	1.76	411	0.0633	ND	52.3	ND	0.3	4.36	388	0.924	7.5	13.8	ND	2.16	1.09	3.09	0.913	ND	47	158	ND	500	4.99	19.2
				8/14/2015	2:33:00 PM	38.5	0.316	1.89	121	ND	ND	51.1	ND	0.125	3.6	ND	ND	8.23	ND	ND	3.3	1.28	3.69	1.13	0.0286	49.8	144	ND	570	5.38	ND
				8/15/2015	2:30:00 PM	119	0.343	1.75	136	ND	ND	43.1	ND	0.0773	2.6	ND	ND	8.99	ND	ND	4.27	0.947	3.62	1.18	ND	66.3	159	ND	920	5.48	ND
				8/16/2015	2:46:00 PM	925	0.25	1.71	319	0.0479	ND	52.7	ND	0.314	5.26	490	0.458	9.48	9.63	ND	2.78	0.835	4.17	0.911	ND	58.2	176	ND	1480	5.71	20.6
				8/17/2015	1:03:00 PM	101	0.263	1.63	132	ND	ND	53.2	ND	0.253	4.65	ND	ND	8.79	2.7	ND	2.55	1.36	3.89	0.731	ND	44.5	141	ND	1020	4.83	ND
				8/18/2015	1:45:00 PM	53.2	0.552	1.56	279	ND	ND	60.6	ND	0.0792	2.62	ND	0.295	9.91	ND	ND	2.17	ND	3.49	0.637	0.0427	38.3	132	ND	410	3.61	20.5
8/19/2015	3:09:00 PM			74.8	0.626	1.57	331	ND	ND	65.7	ND	0.1	2.15	ND	ND	11.4	1.62	ND	2.23	0.897	3.36	0.615	ND	38.1	147	ND	390	4.01	15.3		
8/24/2015	10:37:00 AM			33.8	1.01	1.82	124	ND	ND	62.4	ND	0.0546	2.09	ND	ND	12.8	1.96	ND	2.54	0.778	2.96	0.639	0.0842	39.7	140	ND	344	4.71	ND		
8/25/2015	11:15:00 AM			44.8	0.728	1.64	118	ND	ND	63	ND	0.0654	2.07	ND	ND	13.3	ND	ND	2.04	0.901	3.07	0.612	ND	40.9	139	ND	392	4.59	ND		
8/26/2015	10:05:00 AM			ND	0.335	1.63	117	ND	ND	59.3	ND	0.0703	2.39	ND	ND	12.2	ND	ND	2.11	ND	2.9	0.504	ND	38.7	136	ND	400	4.56	ND		
8/27/2015	10:35:00 AM			707	0.666	2.89	165	0.0536	ND	44.2	ND	0.36	2.56	296	0.332	11.7	10.1	ND	2.38	1.51	4.89	1.19	0.0607	45.4	132	0.0471	570	12.6	6.78		
8/28/2015	10:25:00 AM			493	0.493	1.56	338	ND	ND	239	ND	0.266	2.82	216	ND	35.5	7.82	ND	3.11	1.2	7.19	1.3	ND	65.9	795	ND	1310	6.08	ND		
9/23/2015	1:45:00 PM			68.3	0.671	1.61	136	ND	ND	77.8	ND	0.138	1.78	ND	ND	17.3	4.58	ND	2.16	1.29	3.15	0.645	0.0626	41.3	NS	0.0362	NS	3.98	ND		
10/11/2015	12:00:00 PM			NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1000	NS	NS
10/27/2015	2:45:00 PM			1100	0.593	1.57	152	0.0671	ND	75.8	ND	1.08	2.29	774	0.47	14.1	16.1	ND	2.38	1.21	4.36	0.936	ND	58.3	198	ND	NS	5.01	ND		