Animas and San Juan Watersheds Historical Water Quality Data Summary

Background

This document contains a summary of data available in the Water Quality Portal ([HYPERLINK "http://waterqualitydata.us"]) for the four watersheds related to the Gold King mine spill. The four watersheds summarized in this document are:

Animas River Watershed (14080104)

Middle San Juan Watershed (14080105)

Two Lower San Juan Watersheds (14080201 and 14080205)

The Water Quality Portal contains over 260 million water quality results nationwide and contains data from USGS and EPA as well as over 400+ partners who share data with EPA via the Water Quality Exchange (WQX). This also includes states, tribes, other federal agencies, local communities, and watershed groups. Even considering the broad amount of data in the Portal, it is certainly not a complete data set. Not all parties collecting water quality monitoring data have submitted data to the Portal via WQX. Some notable gaps in this dataset include:

1. Navajo Nation
2. Any of the more recent data collected by the states and tribes in these watersheds
3. Other federal agencies (BLM and USFS)

Some of this missing data has been shared among the parties within the area of interest.

The Water Quality Portal is updated weekly. This summary was developed using a pull of the data on August 19, 2015. This summary is not meant to be a full water quality assessment of the water quality data in these watersheds, but rather is meant to provide insight into the data that are available to support the development of future monitoring strategies and to support any efforts to characterize baseline conditions.

EPA is developing a map in the GeoPlatform that will be available internally and will allow for the exploration of this dataset as well as downloading the raw data from the Water Quality Portal. EPA is also finalizing spreadsheets that provide these summaries in a queryable form. These materials will all be available shortly.

SUMMARY FOF THE ANIMAS RIVER WATERSHED (14080104)

ORGANZIATION SUMMARY: Animas River Watershed (14080104)						
HUC	Organization ID	Organization Name	Num of Stations	Total Number of Samples	Start Date	End Date
14080104	11NPSWRD	National Park Service Water Resources Division	49	69	9/24/1976	11/3/2005
14080104	21COL001	Colorado Dept. of Public Health & Environment	148	3005	1/23/1968	5/13/2008
14080104	21COL001_WQX	Colorado Dept. of Public Health & Environment-WQCD	17	178	10/4/2007	11/1/2011
14080104	21NMEX	NM Environmental Dept./SWQB	7	104	4/16/2002	10/23/2002
14080104	21NMEX_WQX	NM Environmental Dept./SWQB	7	120	3/16/2010	11/1/2010
14080104	CORIVWCH_WQX	The Rivers of Colorado Water Watch Network (RiverWatch)	122	9380	1/1/1800*	6/3/2015
14080104	NARS	EPA National Aquatic Resource Survey Data	1	2	8/5/2003	8/5/2003
14080104	SOUTHUTE	Southern Ute Tribe	14	654	5/12/1992	11/13/2014
14080104	USGS-CO	USGS Colorado Water Science Center	320	2576	9/17/1958	8/12/2015
14080104	USGS-NM	USGS New Mexico Water Science Center	3	1155	1/1/1900	8/12/2015

*This date is likely in error.

Specific parameter ranges for samples taken in water and sediment:

Value Ranges – Water Samples					
Media	Parameter	Fraction	Minimum Value	Maximum Value	Units
Water	Aluminum	Dissolved	0.001	67	mg/l
Water	Aluminum	Total	0.01	19.9	mg/l
Water	Antimony	Dissolved	0.00005	0.011	mg/l
Water	Antimony	Total	0.001	0.001	mg/l
Water	Arsenic	Dissolved	0.0002	0.306	mg/l
Water	Arsenic	Total	0.0005	3.5	mg/l
Water	Barium	Dissolved	0.001	0.2	mg/l
Water	Barium	Total	0.1	0.4	mg/l
Water	Beryllium	Dissolved	0.000012	0.085	mg/l
Water	Beryllium	Total	0.001	0.001	mg/l
Water	Cadmium	Dissolved	0.000012	0.81	mg/l
Water	Cadmium	Total	0.000019	0.07	mg/l
Water	Chromium	Dissolved	0.00009	0.1	mg/l
Water	Chromium	Total	0.0001	0.009	mg/l
Water	Copper	Dissolved	0.0004	62	mg/l
Water	Copper	Total	0.001	0.3564	mg/l
Water	Iron	Dissolved	0.003	730	mg/l

Value Ranges – Water Samples					
Media	Parameter	Fraction	Minimum Value	Maximum Value	Units
Water	Iron	Total	0.01	346.4	mg/l
Water	Lead	Dissolved	0.000015	0.843	mg/l
Water	Lead	Total	0.001	1.1537	mg/l
Water	Magnesium	Dissolved	0.01	500	mg/l
Water	Magnesium	Total	0.139	135	mg/l
Water	Manganese	Dissolved	0.00016	92.4	mg/l
Water	Manganese	Total	0.002	38.105	mg/l
Water	Nickel	Dissolved	0.00058	0.22	mg/l
Water	Nickel	Total	0.01	0.05	mg/l
Water	pH	Total	2.4	9.6	Std Units
Water	Selenium	Dissolved	0.00007	13	mg/l
Water	Selenium	Total	0.0001	0.7	mg/l
Water	Silver	Dissolved	0.000005	0.01	mg/l
Water	Silver	Total	0.001	0.1	mg/l
Water	Tin	Dissolved	0.005	0.02	mg/l
Water	Tin	Total	0.1	0.1	mg/l
Water	Total dissolved solids	Dissolved	0.5	9600	mg/l
Water	Total suspended solids	Dissolved	104	113	mg/l
Water	Turbidity	Total	0.1	5800	NTU
Water	Zinc	Dissolved	0.0007	230	mg/l
Water	Zinc	Total	0.0028	310	mg/l

Value Ranges – Sediment Samples					
Media	Parameter	Fraction	Minimum Value	Maximum Value	Units
Sediment	Antimony	Total	1	3	ppm
Sediment	Barium	Total	2058	2058	ppm
Sediment	Beryllium	Total	1	4	ppm
Sediment	Cadmium	Total	5	5	ppm
Sediment	Chromium	Total	16	42	ppm
Sediment	Copper	Total	10	33	ppm
Sediment	Gold	Total	0.04	0.14	ppm
Sediment	Lead	Total	10	38	ppm
Sediment	Manganese	Total	258	576	ppm
Sediment	Nickel	Total	10	19	ppm
Sediment	Silver	Total	2	6	ppm
Sediment	Tin	Total	10	10	ppm
Sediment	Zinc	Total	100	100	ppm

Within this watershed, there have been several TMDLs developed for Iron, Cadmium, Copper, Lead, Zinc, Aluminum, and pH. Below is a comparison of stations with high values for parameters of interest. This is for informational purposes only, and is not a comparison against water quality criteria.

ANALYSIS against Water Samples		
Parameter	Number of Stations with High Concentrations	Level Compared Against
Aluminum	46	>5 mg/l
Cadmium	10	>.03 mg/l
Copper	4	>.05 mg/l
Iron	46	>10 mg/l
Lead	34	>.1 mg/l
pH	4	>9.5 std units
pH	71	<5 std units
Zinc	10	>10 mg/l

Comparisons were done against both Total and Dissolved Sample Fractions

SUMMARY FOF THE MIDDLE SAN JUAN RIVER WATERSHED (14080105)

ORGANZIATION SUMMARY: Middle San Juan River Watershed (14080105)						
HUC	Organization ID	Organization Name	Num of Stations	Total Number of Samples	Start Date	End Date
14080105	11NPSWRD	National Park Service Water Resources Division	22	39	5/23/1976	9/6/1977
14080105	21COL001	Colorado Dept. of Public Health & Environment	6	414	1/23/1968	5/23/2006
14080105	21COL001_WQX	Colorado Dept. of Public Health & Environment-WQCD	2	16	8/18/2009	6/14/2011
14080105	21NMEX	NM Environmental Dept./SWQB	8	137	4/16/2002	10/29/2002
14080105	21NMEX_WQX	NM Environmental Dept./SWQB	13	245	4/27/2005	11/2/2010
14080105	CORIVWCH_WQX	The Rivers of Colorado Water Watch Network (RiverWatch)	6	868	11/5/1995	6/3/2015
14080105	NARS	EPA National Aquatic Resource Survey Data	1	1	6/26/2001	6/26/2001
14080105	NARS_WQX	EPA National Aquatic Resources Survey	1	2	6/26/2001	6/26/2001
14080105	SOUTHUTE	Southern Ute Tribe	4	225	6/24/1992	8/28/2013
14080105	USGS-AZ	USGS Arizona Water Science Center	6	8	10/4/1957	6/22/1972
14080105	USGS-CO	USGS Colorado Water Science Center	72	172	9/18/1958	9/4/2002
14080105	USGS-NM	USGS New Mexico Water Science Center	25	3083	2/29/1944	8/12/2015
14080105	UTEMTN	Ute Mountain Utes Tribe (Colorado)	4	4	1/16/2002	1/22/2002

Specific parameter ranges for samples taken in water and sediment:

Value Ranges – Water Samples					
Media	Parameter	Fraction	Minimum Value	Maximum Value	Units
Water	Aluminum	Dissolved	0.001	1.2	mg/l
Water	Aluminum	Total	0.01	25.46448315	mg/l
Water	Antimony	Dissolved	0.00005	0.001	mg/l
Water	Antimony	Total	0.001	0.01	mg/l
Water	Arsenic	Dissolved	0.0002	0.226	mg/l
Water	Arsenic	Total	0.0005	0.234	mg/l
Water	Barium	Dissolved	0.002	0.4	mg/l
Water	Barium	Total	0.1	0.3	mg/l
Water	Beryllium	Dissolved	0.000012	0.01	mg/l
Water	Beryllium	Total	0.001	0.001	mg/l
Water	Cadmium	Dissolved	0.00002	0.08	mg/l
Water	Cadmium	Total	0.0001	0.07	mg/l
Water	Chromium	Dissolved	0.0001	0.04	mg/l
Water	Chromium	Total	0.0001	0.01	mg/l
Water	Copper	Dissolved	0.001	0.1	mg/l
Water	Copper	Total	0.001	0.1732	mg/l
Water	Iron	Dissolved	0.003	50	mg/l
Water	Iron	Total	0.01	78	mg/l
Water	Lead	Dissolved	0.00008	0.4	mg/l
Water	Lead	Total	0.0005	0.04	mg/l
Water	Magnesium	Dissolved	0.1	810	mg/l
Water	Magnesium	Total	1	222	mg/l
Water	Manganese	Dissolved	0.00014	13	mg/l
Water	Manganese	Total	0.001	4.7401	mg/l
Water	Nickel	Dissolved	0.00006	0.1	mg/l
Water	Nickel	Total	0.01	0.01	mg/l
Water	pH	Total	11.9	12	Std Units
Water	Selenium	Dissolved	0.0001	0.72	mg/l
Water	Selenium	Total	0.0001	3.2	mg/l
Water	Silver	Dissolved	0.00006	0.01	mg/l
Water	Silver	Total	0.001	0.01	mg/l
Water	Tin	Dissolved	0.006	0.006	mg/l
Water	Tin	Total	0.1	1	mg/l
Water	Total dissolved solids	Dissolved	10000	29000	mg/l
Water	Turbidity	Total	0.9	14000	NTU
Water	Zinc	Dissolved	0.001	7.9	mg/l
Water	Zinc	Total	0.01	2.579	mg/l

Value Ranges – Sediment Samples					
Media	Parameter	Fraction	Minimum Value	Maximum Value	Units
Sediment	Antimony	Total	1	3	ppm
Sediment	Barium	Total	366	977	ppm
Sediment	Beryllium	Total	1	2	ppm
Sediment	Cadmium	Total	5	5	ppm
Sediment	Chromium	Total	17	48	ppm
Sediment	Copper	Total	16	31	ppm
Sediment	Gold	Total	0.04	0.11	ppm
Sediment	Lead	Total	10	13	ppm
Sediment	Manganese	Total	140	572	ppm
Sediment	Nickel	Total	15	17	ppm
Sediment	pH	Total	8.4	8.4	std units
Sediment	Silver	Total	5	5	ppm
Sediment	Tin	Total	10	10	ppm
Sediment	Zinc	Total	12	217	ppm

The Middle San Juan River has impairments for bacteria, turbidity, and dissolved oxygen. Below is a comparison of stations with high values for parameters of interest. This is for informational purposes only, and is not a comparison against water quality criteria.

ANALYSIS against Water Samples		
Parameter	Number of Stations with High Concentrations	Level Compared Against
Aluminum	8	>5 mg/l
Cadmium	2	>.03 mg/l
Iron	6	>10 mg/l
Lead	3	>.1 mg/l
pH	3	>9.5 std units
pH	6	<5 std units

Comparisons were done against both Total and Dissolved Sample Fractions

SUMMARY FOF THE LOWER SAN JUAN RIVER WATERSHED (14080201)

ORGANZIATION SUMMARY: Lower San Juan River Watershed (14080201)						
HUC	Organization ID	Organization Name	Num of Stations	Total Number of Samples	Start Date	End Date
14080201	11NPSWRD	National Park Service Water Resources Division	19	26	8/20/1978	9/14/1994
14080201	21COL001	Colorado Dept. of Public Health & Environment	1	131	1/23/1968	12/7/1978
14080201	USGS-AZ	USGS Arizona Water Science Center	17	39	1/1/1949	7/16/1973
14080201	USGS-CO	USGS Colorado Water Science Center	12	19	12/5/1956	11/7/1990
14080201	USGS-NM	USGS New Mexico Water Science Center	1	286	12/13/1977	8/9/2015
14080201	USGS-UT	USGS Utah Water Science Center	229	731	11/13/1933	9/3/2014
14080201	UTAHDWQ*	Utah Department Of Environmental Quality	83	1963	1/28/1975	1/23/2008
14080201	UTAHDWQ_WQX	Utah Department Of Environmental Quality	85	2034	1/28/1975	5/27/2009
14080201	UTEMTN	Ute Mountain Utes Tribe (Colorado)	17	143	7/16/1996	6/21/2007

*some of the data between UTAHDWQ and UTAHDWQ_WQX may be duplicative

Specific parameter ranges for samples taken in water and sediment:

Value Ranges – Water Samples					
Media	Parameter	Fraction	Minimum Value	Maximum Value	Units
Water	Aluminum	Dissolved	0.0009	10.4	mg/l
Water	Antimony	Dissolved	0.000021	0.000664	mg/l
Water	Antimony	Total	0.001	0.001	mg/l
Water	Arsenic	Dissolved	0.00014	0.155	mg/l
Water	Arsenic	Total	0.00045	0.34	mg/l
Water	Barium	Dissolved	0.0001	0.5	mg/l
Water	Barium	Total	0.0161	0.051	mg/l
Water	Beryllium	Dissolved	0.000004	0.01	mg/l
Water	Cadmium	Dissolved	0.000013	0.28	mg/l
Water	Cadmium	Total	0.0001	0.01	mg/l
Water	Chromium	Dissolved	0.00006	0.105	mg/l
Water	Chromium	Total	0.005	0.005	mg/l
Water	Copper	Dissolved	0.00061	16.94	mg/l
Water	Copper	Total	0.005	0.005	mg/l
Water	Iron	Dissolved	0.002	21	mg/l
Water	Lead	Dissolved	0.000031	0.1	mg/l

Value Ranges – Water Samples					
Media	Parameter	Fraction	Minimum Value	Maximum Value	Units
Water	Lead	Total	0.001	0.001	mg/l
Water	Magnesium	Dissolved	0.2	22400	mg/l
Water	Magnesium	Total	5	132	mg/l
Water	Manganese	Dissolved	0.00011	4.69	mg/l
Water	Manganese	Total	0.121	0.121	mg/l
Water	Nickel	Dissolved	0.0001	0.1	mg/l
Water	Nickel	Total	0.003	0.003	mg/l
Water	pH	Total	10.8	83	std units
Water	Selenium	Dissolved	0.00003	0.57	mg/l
Water	Selenium	Total	0.00008	0.2308	mg/l
Water	Silver	Dissolved	0.000004	0.15	mg/l
Water	Total dissolved solids	Dissolved	1020	283000	mg/l
Water	Turbidity	Total	0.11	15300	NTU
Water	Zinc	Dissolved	0.0013	12.1	mg/l
Water	Zinc	Total	ND	7.8	mg/l

Value Ranges – Sediment Samples					
Media	Parameter	Fraction	Minimum Value	Maximum Value	Units
Sediment	Antimony	Total	1	4	ppm
Sediment	Barium	Total	1034	2759	ppm
Sediment	Beryllium	Total	1	2	ppm
Sediment	Cadmium	Total	5	5	ppm
Sediment	Chromium	Total	13	132	ppm
Sediment	Copper	Total	10	30	ppm
Sediment	Gold	Total	0.04	0.14	ppm
Sediment	Lead	Total	5	8	ppm
Sediment	Manganese	Total	189	485	ppm
Sediment	Nickel	Total	15	48	ppm
Sediment	Silver	Total	5	5	ppm
Sediment	Tin	Total	10	10	ppm
Sediment	Zinc	Total	10	98	ppm

Within this watershed are impaired waters for phosphorous, radiation, temperature, and low dissolved oxygen. Below is a comparison of stations with high values for parameters of interest. This is for informational purposes only, and is not a comparison against water quality criteria.

ANALYSIS against Water Samples		
Parameter	Number of Stations with High Concentrations	Level Compared Against
Aluminum	2	>5 mg/l
Cadmium	2	>.03 mg/l
Copper	2	>.05 mg/l
Iron	1	>10 mg/l
pH	4	<5 std units
pH	18	>9.5 std units
Zinc	2	>10 mg/l

Comparisons were done against both Total and Dissolved Sample Fractions

SUMMARY FOF THE LOWER SAN JUAN RIVER WATERSHED (14080205)

ORGANZIATION SUMMARY: Lower San Juan River Watershed (14080205)						
HUC	Organization ID	Organization Name	Num of Stations	Total Number of Samples	Start Date	End Date
14080205	11NPSWRD	National Park Service Water Resources Division	81	128	5/16/1978	12/15/2005
14080205	NARS	EPA National Aquatic Resource Survey Data	1	2	8/9/2000	8/9/2000
14080205	USGS-AZ	USGS Arizona Water Science Center	7	12	11/10/1948	12/17/1991
14080205	USGS-UT	USGS Utah Water Science Center	65	2917	6/5/1928	7/20/2015
14080205	UTAHDWQ*	Utah Department Of Environmental Quality	16	650	2/18/1976	12/11/2007
14080205	UTAHDWQ_WQX	Utah Department Of Environmental Quality	16	700	2/18/1976	5/27/2009

*some of the data between UTAHDWQ and UTAHDWQ_WQX may be duplicative

Specific parameter ranges for samples taken in water and sediment:

Value Ranges – Water Samples					
Media	Parameter	Fraction	Minimum Value	Maximum Value	Units
Water	Aluminum	Dissolved	0.001	4.3	mg/l
Water	Aluminum	Total	0.323	0.323	mg/l
Water	Antimony	Dissolved	0.000007	0.002	mg/l
Water	Arsenic	Dissolved	0.00017	0.0075	mg/l
Water	Arsenic	Total	0.001	0.18	mg/l
Water	Barium	Dissolved	0.0001	0.5	mg/l
Water	Barium	Total	0.2	0.5	mg/l

Value Ranges – Water Samples					
Media	Parameter	Fraction	Minimum Value	Maximum Value	Units
Water	Beryllium	Dissolved	0.00002	0.01	mg/l
Water	Cadmium	Dissolved	0.000016	0.01	mg/l
Water	Cadmium	Total	ND	0.02	mg/l
Water	Chromium	Dissolved	0.000618	0.055	mg/l
Water	Copper	Dissolved	0.00004	0.2	mg/l
Water	Iron	Dissolved	0.003	9.71	mg/l
Water	Iron	Total	0.0463	37	mg/l
Water	Lead	Dissolved	0.000024	0.1	mg/l
Water	Magnesium	Dissolved	1.9	640	mg/l
Water	Manganese	Dissolved	0.000206	2.7	mg/l
Water	Manganese	Total	0.0388	0.359	mg/l
Water	Nickel	Dissolved	0.00003	0.85	mg/l
Water	pH	Total	3.2	9.3	Std Units
Water	Selenium	Dissolved	0.00005	0.0129	mg/l
Water	Selenium	Total	ND	0.027	mg/l
Water	Silver	Dissolved	0.0008	0.01	mg/l
Water	Tin	Dissolved	0.0005	0.0005	mg/l
Water	Total dissolved solids	Dissolved	1110	3340	mg/l
Water	Turbidity	Total	0.3	11000	NTU
Water	Zinc	Dissolved	0.001	0.77	mg/l

Value Ranges – Sediment Samples					
Media	Parameter	Fraction	Minimum Value	Maximum Value	Units
Sediment	Antimony	Total	1	2	ppm
Sediment	Barium	Total	213	645	ppm
Sediment	Beryllium	Total	1	2	ppm
Sediment	Cadmium	Total	5	5	ppm
Sediment	Chromium	Total	17	65	ppm
Sediment	Copper	Total	10	31	ppm
Sediment	Gold	Total	0.01	0.07	ppm
Sediment	Lead	Total	5	8	ppm
Sediment	Manganese	Total	105	777	ppm
Sediment	Nickel	Total	15	27	ppm
Sediment	Silver	Total	5	5	ppm
Sediment	Tin	Total	10	10	ppm
Sediment	Zinc	Total	10	54	ppm

Within this watershed there are no identified water quality impairments. Below is a comparison of stations with high values for parameters of interest. This is for informational purposes only, and is not a comparison against water quality criteria.

ANALYSIS against Water Samples		
Parameter	Number of Stations with High Concentrations	Level Compared Against
Iron	1	>10 mg/l
pH	2	<5 std units

Comparisons were done against both Total and Dissolved Sample Fractions

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