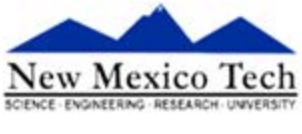
Animas, San Juan Spring Runoff Preparedness Plan

May 5, 2017

Navajo Nation
Environmental Protection Agency

San Juan Soil and Water Conservation District (NM)

COLORADO
Division of Homeland Security
& Emergency Management
Department of Public Safety



Introduction

On August 5, 2015, a U.S. Environmental Protection Agency (EPA) work crew digging into the Gold King Mine (GKM) Level 7 adit near Gladstone, Colorado, triggered a blowout and ongoing discharge of impounded mine water. The EPA reported that more than 3 million gallons of acidic mine water containing sediment, heavy metals, and other chemicals discharged into Cement Creek, which flows into the Animas River, and into New Mexico where the Animas River joins the San Juan River before flowing into the Navajo Nation and Utah. EPA also estimated that more than 400,000 Kg of metals entered the Animas River as a result of the GKM discharge. Additionally, naturally occurring acid rock drainage and legacy mining and milling sites discharged metals in the watersheds long before the GKM spill. Metals are accumulated and stored in streambed sediments during low flow, and these metals can be released into the water column in both dissolved and suspended phases during periods of high flow. Monitoring data collected since August 5, 2015 confirm that that concentrations of dissolved and total metals in the Animas and San Juan Rivers sometimes increase during high streamflow caused by monsoonal storm events, and during spring runoff. Relationships between turbidity and dissolved and total metals in river water are being evaluated.

River water is a source of public and private drinking water supply, as well as for irrigated agriculture and livestock watering. Concentrations of metals in surface water are within regulatory standards for irrigated agriculture, livestock watering, and aquatic life protection. Total metals in untreated river water, however, fluctuate and at times increase to concentrations greater than drinking water standards during periods of high flow. These increases of total metal concentrations in raw, untreated river water are not a violation of EPA National Primary Drinking Water Regulations, but are problematic to the public water systems that use rivers as a water source. Public water systems must ensure that their treatment infrastructure produces drinking water in compliance with the National Primary Drinking Water Regulations, and there is concern about the potential for accumulation of metals in the treatment system infrastructure. Spring 2017 will be the second snowmelt runoff season in the Animas and San Juan watersheds after the GKM spill. In addition to public health and safety hazards that typically occur in flood events, potential for heavy metals contamination in the watershed remains a concern.

Preparedness Plan

A consortium of state, tribal, county, municipal, and federal agencies (whose logos appear on the first page of this document) are working together to put the following actions and contingencies into place.

On September 7, 2015, the EPA issued a GKM Stakeholders Alert and Notification Plan. The EPA continues to implement this notification plan in conjunction with the operation of the Interim Wastewater Treatment Plant installed in October 2015 near the old town site of Gladstone (Gladstone IWTP). In this plan, EPA states "The Plan in its current form will remain

in effect as long as work is ongoing at the GKM site." On January 12, 2017, EPA recommended continued operation of the Gladstone IWTP to collect and treat acid mine water flowing from the GKM adit under the Bonita Peak Mining District Superfund Site.

https://www.epa.gov/newsreleases/us-environmental-protection-agency-announces-continued-operation-interim-water

The collaborating agencies will work with EPA and other stakeholders to update and modify EPA's notification plan.

Emergency Operations and Incident Command

The collaborating agencies will activate their emergency operations and command structures as they deem necessary. State, tribal, county and municipal law enforcement, firefighters, emergency medical technicians (EMTs), river rescue teams and personnel called upon to protect public safety during flooding situations will be provided with a copy of this preparedness plan and the opportunity to ask questions.

The NMED hosted a first-responder training session on April 4, 2017, at the Farmington, NM Civic Center to review and discuss this preparedness plan with law enforcement officers, firefighters, EMTs and homeland security officials. The NMED also presented the Health and Safety Plan required for NMED personnel assisting with flood response.

To the greatest extent possible, regulatory and scientific agencies provide technical expertise and resources to emergency response agencies to prepare for and respond to flooding events.

Continuous River Monitoring for Turbidity, Conductance, and pH

The City of Farmington, NM deployed sondes at each of their two pump stations that divert river water for treatment and drinking-water supply (Figure 1). The states of Colorado, New Mexico, and Utah partnered with the U.S. Geological Survey (USGS) water science centers in each respective state to deploy a network of continuous river monitoring equipment or multi-parameter sondes at the following USGS Gaging Stations that are also shown in Figure 1:

- Cement Creek at Silverton, CO (09358550)
- Animas River below Silverton, CO (09359020)
- Animas River at Durango, CO (09361500)
- Animas River near Cedar Hill, NM (09363500)
- Animas River below Aztec, NM (09364010)
- San Juan River at Farmington, NM (09365000)
- San Juan at Shiprock, NM (09368000)
- San Juan at Four Corners, CO (09371010)
- San Juan near Bluff, UT (09379500)

The sondes measure turbidity, specific conductance, pH, and temperature. USGS makes provisional data from their sondes, along with stream flow data from those locations, available on the USGS WaterWatch website http://waterwatch.usgs.gov/index.php. The WaterWatch website allows users to access real-time USGS monitoring data. The WaterWatch website also allows users to self-subscribe for email and/or text alerts when monitoring parameters exceed values specified by the subscriber.

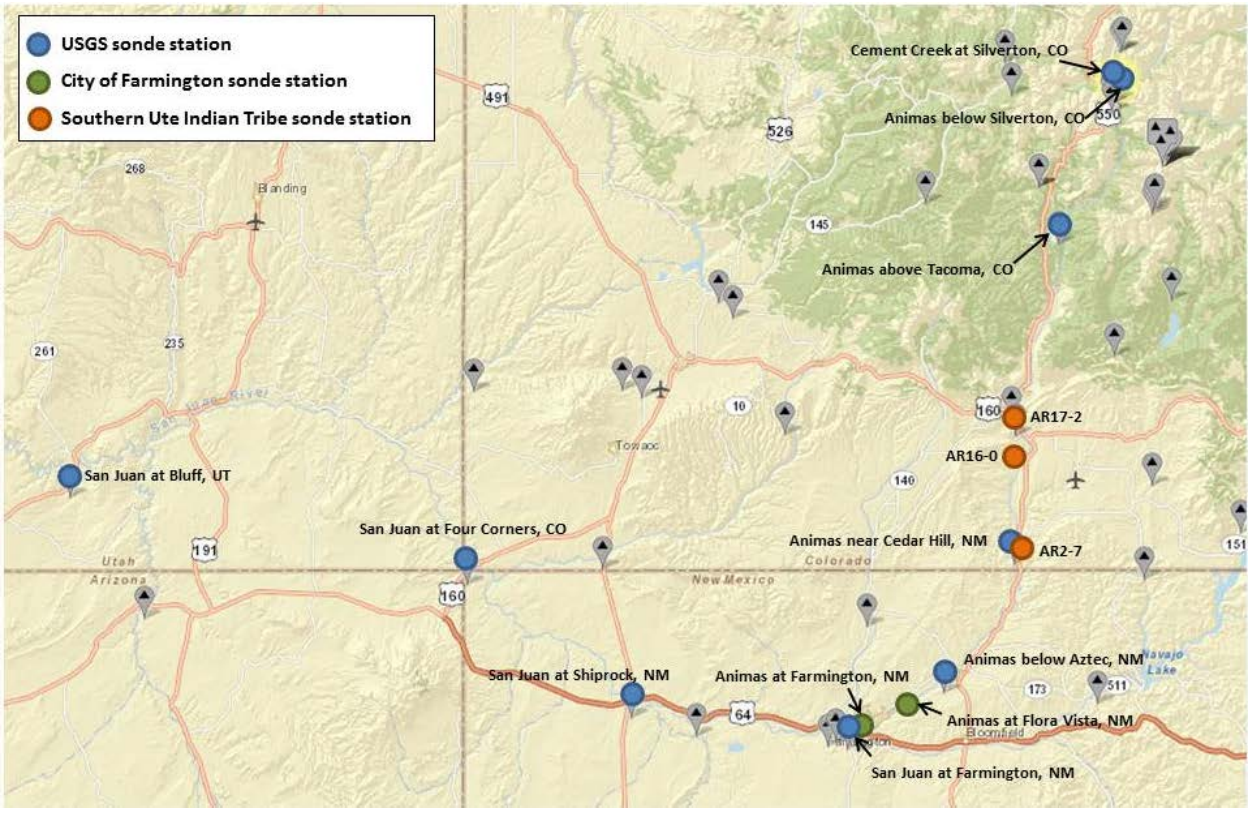
The Southern Ute Indian Tribe (SUIT) has deployed three continuous reading sondes on the Animas River within the exterior boundaries of the SUIT Reservation (Figure 1). The sondes measure pH, dissolved oxygen, temperature, and specific conductance in 30 minute increments. The sondes are not linked to a real-time reporting mechanism, but the data will be uploaded weekly to the Tribe's water quality program website https://www.southernute-nsn.gov/environmental-programs/water-quality/. The sonde sites (numbered in river miles from the New Mexico border north) under evaluation are:

AR17-2: Near the northern border of the SUIT Reservation below the City of Durango

AR 16-0: Below Basin Creek and above the Weaselskin Bridge

AR2-7: Southern border of the SUIT Reservation, below the Florida River confluence with the Animas.

Figure 1. Map of Sonde Locations.



The collaborating parties are exploring the feasibility of increasing the availability of sonde data through an Internet geographic information system. The sonde data can be used by regulatory agencies, public water systems, irrigators, and other water users to inform decisions on continued use and treatment of river water.

Surface Water Quality Sampling

USGS completed integrated river water sampling at beginning, peak and recession of spring snowmelt at four sonde locations in 2016: Animas near Cedar Hill, Animas below Aztec, San Juan at Farmington, and San Juan at Shiprock. The Colorado Department of Public Health and Environment (CDPHE) performed the same analysis at the sonde locations north of the Cedar Hill station. Samples were analyzed for dissolved and total metals, and for general chemistry. Currently, the USGS has installed an automated water sampling device on the Animas below the Aztec gaging station to collect samples for total metals and general chemistry. Samples analyzed by the USGS laboratory are made available to the public on the USGS website after their quality assurance and control procedures are complete. The NMED and the Cities of Farmington, NM, and Durango, CO, also will continue to collect river water samples for analysis of dissolved and total metals based on existing sampling schedules and during periods of high turbidity.

The SUIT are collecting monthly surface water and sediment samples at the three sonde locations noted above during 2017. The surface water samples are assessed for 25 total and dissolved metals and major cations. The sediment samples are analyzed for 8 total metals. The analyte list and lab analyses follows an EPA-approved Sampling and Analysis Plan. These data are available via the Tribe's Water Quality Website and shared directly with partnering agencies and the public. The water quality and sediment sites (numbered in river miles from the New Mexico Border north) under evaluation are:

AR17-2: Near the northern border of the Reservation below the City of Durango

AR 16-0: Below Basin Creek and above the Weaselskin Bridge

AR2-7: Southern border of the Reservation, below the Florida River confluence with the Animas.

The NMED and City of Farmington will continue to evaluate the relationships between turbidity and dissolved and total metals. These relationships will be communicated to water users to help inform any decisions water users may make on continued use and treatment of river water (see Water Hauling Fact Sheet below).

In Utah, the Utah Department of Environmental Quality (UDEQ) collected weekly water quality samples from four sites. UDEQ collected water quality samples (total and dissolve metals and major anions and cations) weekly during spring runoff at the following San Juan River monitoring locations:

- MLID 4953000: the San Juan River at Mexican Hat, Utah (hereafter referred to as SJR Mexican Hat site)
- MLID 4953250: the San Juan River at Sand Island located near the town of Bluff, Utah (hereafter referred to as SJR Bluff site)
- MLID 4953390: the San Juan River in Montezuma, Utah (hereafter referred to as SJR Montezuma)
- MLID 4954000: the highway 160 bridge crossing the San Juan River in Colorado (hereafter referred to as SJR Stateline site)

UDEQ conducted 10 weeks of sampling to ensure that the peak of the spring runoff period is captured and to provide sufficient data to develop site-specific relationships between parameters monitored continuously (e.g., turbidity, pH, and specific conductance) and dissolved and total metals in the water column.

In Colorado, CDPHE collected monthly water chemistry and sediment grab samples corresponding to the rise, peak and fall of spring runoff from one site on Cement Creek and 3 sites on the Animas River to analyze for dissolved and total metals, plus additional parameters in CDPHE's routine water chemistry panel. Samples will be analyzed by CDPHE. The water quality grab samples were collected at the following sites proximate to existing USGS Gages:

- WQCD CEM49 – Cement Creek at mouth
- WQCD 82 – Animas River near Silverton
- WQCD 81 – Animas River at Baker's Bridge
- WQCD 9423A – Animas River at 9th Street Bridge in Durango

When threshold exceedance notifications occur at the USGS gages on Cement Creek or the Animas River, within Colorado, local monitoring participants will use handheld, multi-parameter sondes to confirm threshold exceedances. Alert notifications may be modified as necessary based on new data. Additionally, water chemistry and sediment grab samples will be collected during the onsite verification.

The Navajo Nation Environmental Protection Agency (NNEPA) is collecting water and sediment samples at 15 locations between Farmington, NM, and Mexican Hat, UT. Fifteen samples will be collected at each location between October 2016 and early July 2017. Seven rounds were completed by early April 2017. Water will be analyzed for total and dissolved metals, major ions, total suspended solids, and gross alpha. Sediment will be analyzed for 25 metals, alkalinity, SO_4, F, and Cl. The 15 locations include 10 San Juan River sites, three major tributaries, and two canals:

- 10-37: San Juan River near mouth of La Plata River.
- 10-40: Fruitland Canal at first bridge downstream from head gate

- 10-38: San Juan River upstream from fish passage at PNM intake
- 10-25: San Juan River at the Hogback
- 10-42: Hogback Canal between head gate and first waste way
- 06-04: Chaco River near confluence with San Juan River
- 10-36: San Juan River at Shiprock, NM, Hwy 491/64 bridge
- 10-26: San Juan River 16 miles downstream from Shiprock
- 07-01: Mancos River near confluence with San Juan River
- 02-06: San Juan River near CO/NM border
- 02-09: San Juan River at Aneth, UT (upstream from McElmo Creek)
- 04-01: McElmo Creek near confluence with San Juan River
- 02-07: San Juan River at Montezuma Creek, UT (downstream from bridge)
- 02-08: San Juan River downstream from Bluff, UT (at Hwy 191 bridge)
- 29-05: San Juan River at Mexican Hat, UT (upstream from Hwy 163 bridge)

Lake Powell Sediment Monitoring

To evaluate the current pollutant loading via sediment transport to Lake Powell, UDEQ plans to contract with USGS to deploy sediment traps, and conduct a coring investigation in the San Juan River delta of Lake Powell. The USGS deployed sediment traps soon after the GKM release (Figure 2) and these sediments are currently being analyzed for metals. The metal concentrations will be used to evaluate the concentrations of metals in sediments that are being deposited into Lake Powell. The data will be compared to metal concentrations in San Juan River sediments further upstream and in historic core data from Lake Powell.

Figure 2. Sediment trap deployed in San Juan River Delta August - September, 2015

Drinking-Water Monitoring and Sharing

The collaborating agencies continue to work closely with public water supply systems to ensure that treated drinking water provided to consumers complies with all of the National Primary Drinking Water Standards. Multiple levels of protection have been put in place to prevent contaminants in the river water from occurring in treated drinking water at concentrations exceeding drinking water standards.

Water sharing infrastructure and agreements, as were developed during the August 2015 spill event, remain in place if needed to ensure that some of the smaller systems do not run out of water in the event that river intakes are closed due to high levels of metals.

Aquifer and Water-Well Monitoring

The N.M. Bureau of Geology (NMBG) conducted water seasonal water-table mapping, and sampling of private domestic wells potentially influenced by surface water during August 2015 and January 2016, and is continuing the work through June 2018. Water samples are analyzed by the NMBG laboratory for metals, general chemistry and stable isotopes. NMBG also has installed continuous water-level recorders at several locations in the Animas River alluvial aquifer. NMBG will repeat the water-table mapping and water-well testing during the period of snowmelt runoff. The monitoring data will be reviewed to identify any possible changes in hydraulic relationships between the aquifer and river and in well water chemistry. If any wells are suspected of having been influenced by surface water, NMED and NMBG will advise and counsel the well users.

San Juan Basin Public Health (SJBPH) performed periodic sampling of private domestic wells within Colorado that may be influenced by surface water in collaboration with CDPHE. Water samples were analyzed for metals, bacteria, nitrate/nitrite and basic chemistry. SJBPH and CDPHE provide guidance to well users based on the results of this sampling.

In January 2016, the SUIT initiated a well monitoring program for tribal members on the Reservation with close proximity to the Animas River. In 2017, the Tribe will continue to collect well samples quarterly and deliver the samples to a private, EPA-accredited lab for analysis of 28 metals and cations.

Flooding of Residential Areas

In the event that residential areas are flooded, first responders will follow standard procedures to protect public safety and property. If private domestic wells become inundated by flood water or show evidence of surface water contamination, the collaborating agencies will advise the residents of emergency water well disinfection procedures (see Fact Sheet below). The collaborating agencies also may provide free testing of inundated wells for both E coli (after disinfection is completed) and for total metals. The collaborating agencies will notify well owners of any high test results for metals and will follow up with homeowners on options to resolve the issue.

Storage and Disposal of Potentially Contaminated Flood Sediment

Within areas under state or tribal jurisdiction, the relevant environmental agencies will work with communities that are at risk of flooding to identify locations where potentially contaminated flood sediment can be stored and properly disposed. Testing protocol and criteria will be developed to determine the appropriate method of disposal.

Pre-Runoff Training for Partners and Stakeholders

The collaborating states and tribes will host one or more training sessions, as necessary to inform first responders of the provisions of this preparedness plan. Training on how to use the USGS WaterWatch website also will be offered. NMED prepared a training presentation on Health and Safety during flood-response operations that is also available to the collaborating agencies.

Public Notification and Communication

Reverse 911 – The collaborating emergency response agencies have drafted reverse 911 messages for various situations that may arise, including closure of river areas due to dangerously high water, and flooding of residential areas. The agencies will discuss what specific observations or events might be used to trigger the issuance of a reverse 911 notification, and will discuss the need to develop additional messages for situations that may arise.

San Juan County (NM) AG Alert – This system was created by NM State University to communicate with farmers and ranchers in the area, and sends out telephone messages similar to a reverse 911 system. During spring runoff, the AG Alert system will be used to advise the agricultural community of the quality of river water and compliance with NM Water Quality Control Commission stream standards for irrigation and livestock watering.

Fact Sheets – Some of the collaborating agencies have developed the following Fact Sheets on how area residents can protect themselves from various potential hazards that they may encounter. The resources can be found on the respective entities' websites.

- Animas and San Juan River Below the Animas Confluence Exposure and Risk Dashboard, NMED
- Disinfecting a Domestic Well with Shock Chlorination, NM State University
- Water Hauling and Safety, NMED and NM Department of Health