NABIAP-25-16

**RESOLUTION OF THE
NAABIK'ÍYÁTI' COMMITTEE OF THE
NAVAJO NATION COUNCIL**

23rd NAVAJO NATION COUNCIL - SECOND YEAR, 2016

AN ACTION

RELATING TO HEALTH, EDUCATION AND HUMAN SERVICES, RESOURCES AND DEVELOPMENT AND NAABIK'ÍYÁTI' COMMITTEES; DEMANDING THE PRESIDENT OF THE UNITED STATES AND HIS DESIGNEES TO HOLD THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AND OTHER RESPONSIBLE PARTIES ACCOUNTABLE FOR THEIR MISCONDUCT RESULTING IN A TOXIC SPILL FROM THE GOLD KING MINE INTO THE ANIMAS RIVER, WHICH FLOWS INTO THE SAN JUAN RIVER, AND CAUSING CATASTROPHIC CONSEQUENCES FOR THE PEOPLE OF THE NAVAJO NATION

WHEREAS:

A. The Health, Education and Human Services Committee (HEHSC) is a Navajo Nation Council standing committee that has the authority to review and recommend resolutions relating to environmental health. 2 N.N.C. §§ 400(A), 401 (B)(6)(a) (2012); see also CJA-03-13.

B. The Resources and Development Committee (RDC) is a Navajo Nation Council standing committee that exercises oversight authority over water, environment, environmental protection, agriculture, and livestock. 2 N.N.C. §§ 500(A), 500 (C) (2012); see also CJA-03-13.

C. The Navajo Nation established the Naabik'íyáti' Committee as a Navajo Nation Council standing committee and as such empowered Naabik'íyáti' Committee to coordinate all federal programs e.g. United States Environmental Protection Agency to provide the most efficient delivery of services to the Navajo Nation. 2 N.N.C. §§ 164 (A)(9), 700 (A), 701 (A)(4) (2012); see also CJA-03-13.

D. The Navajo Nation has a government-to-government relationship with the United States of America. Treaty of 1850, Sept. 24, 1850, 9 Stat. 974 and Treaty of 1868, Aug. 12, 1868, 15 Stat. 667.

E. The Gold King Mine is an abandoned mine located in the Upper Animas Watershed in southwestern Colorado. *See* Gold King Mine Fact Sheet attached as Exhibit A.

F. On August 5, 2015, the United States Environmental Protection Agency (EPA) was investigating the mine site in order to "assess the on-going water releases from the mine, treat mine water, and assess the feasibility of further mine remediation." *See* EPA Emergency Response attached as Exhibit B.

G. While excavating above an old mine entrance, EPA workers and contractors negligently triggered a leak of pressurized water that resulted in spilling about three million gallons of contaminated water into Cement Creek, which feeds into the Animas River. See Exhibit B; *See* also Chronology of Events attached as Exhibit C.

H. The mine outside Silverton, Colorado, has continued to leak into Cement Creek, which feeds into the Animas River, which flows into the San Juan River.

I. The release of the contaminated wastewater into the local irrigation source for countless Navajo farmers has severely and negatively impacted their crops at the height of growing season, and caused Navajo families to question whether they will have enough income to support themselves throughout the year.

J. Moreover, the release has contaminated drinking water in the area, including local wells, and caused Navajo families to have to haul water over hundreds of miles in order to ensure the survival of their families and livestock.

K. Environmental Protection Agency estimates that most of the metals from the Gold King Mine spill were deposited in the Animas River riverbed. *See* EPA: Gold King Mine Drainage Release: DRAFT Analysis of Fate & Transport of Metals in the Animas and San Juan Rivers, attached as Exhibit E. This raises concerns that toxic metals may be disturbed by increased flow from snow melt and storm events and thereby released into the river. The Navajo Nation has initiated efforts to monitor water quality and provide notice of

potential issues to farmers and water users along the river. *See* 2-page fact sheet entitled Spring 2016 Sampling in Responses to the Gold King Mine Release attached as Exhibit F.

L. The Navajo Nation is working with many other state and tribal entities to coordinate sampling efforts and share data with the goal of developing a robust and comprehensive understanding of the extent of mining-related contamination in the San Juan watershed and its effects on human health and the environment. EPA should provide financial support for these efforts in order to mitigate the effects of its misconduct.

M. To date, scientists and experts are unable to determine the long-term effects of the spill.

N. It has now been determined that the EPA was aware that the conditions at the Gold King Mine presented "an endangerment to human health and the environment" and there was potential for "blowouts" as early as June 25, 2014. *See* Work Order from EPA contractor released August 21, 2015 attached as Exhibit D.

O. Dating back to the 1800s, the Supreme Court has recognized the federal trust relationship between Indian tribes and the United States government: "[Indian tribes] relations to the United States resemble that of a ward to his guardian." Cherokee Nation v. State of Ga., 30 U.S. 1, 2 (1831).

P. On August 12, 1868, the United States of America proclaimed the Treaty between the United States of America and the Navajo Tribe of Indians (herein "Treaty"), forever binding the two parties in a trust relationship.

Q. Article XIII of the Treaty states that the tribe herein named, by their representatives, parties to this treaty, agree to make the reservation herein described their permanent home, and they will not as a tribe make any permanent settlement elsewhere.

R. As the permanent home of the Navajo People, it is imperative that the Federal Government be guided by its responsibility to ensure that the Navajo Nation reservation and affiliated lands are adequately protected from preventable environmental disasters.

S. Diné Natural Law teaches that it is the duty of the Diné - and thus their federal counterparts with whom the responsibility of environmental protection is shared - to protect and preserve that beauty of the natural world for future generations. 1 N.N.C. § 205(G).

T. Additionally, the EPA must adhere to several federal laws and regulations intended to shield human beings from preventable environmental disasters, including but not limited to their responsibility under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

U. The spill created at the Gold King Mine by the EPA's misconduct was not only foreseeable but entirely preventable, and that spill has resulted in the contamination of water essential to the very livelihood of Navajo families.

V. As the party responsible for releasing the Gold King Mine contamination into the Diné People's sacred source of life-giving water, the EPA should publicly acknowledge its responsibility for this disaster, and should commit to supporting the Navajo Nation's efforts to restore harmony to the Animas River, the San Juan River, and all lands and people adversely affected by this spill.

NOW, THEREFORE, BE IT RESOLVED:

A. On behalf of the Navajo People in need of urgent attention, the Navajo Nation demands that the President of the United States and his designees hold the United States Environmental Protection Agency and other responsible parties accountable for their misconduct resulting in a toxic spill from the Gold King Mine into the Animas River and causing catastrophic and far-reaching consequences for the people of the Navajo Nation.

B. The Navajo Nation requests that President of the United States and his designees meet with U.S. Environmental Protection Agency officials and personnel to address how the spill at the Gold King Mine will be addressed in the future as this action has endangered the lives of many Navajo People.

C. The President of the United States and EPA should publicly commit to implementing and/or fully funding the requests of the Navajo Nation and other affected states, tribes, and local entities for:

- A fair and independent assessment of the role the EPA and others played in the events leading up to and causing the Gold King Mine spill;
- A comprehensive study of the San Juan watershed to determine the nature and extent of mine-related contamination and its effects on human health and the environment;
- Listing of the Upper Animas Mining District on the CERCLA National Priorities List;
- Sampling and analysis of water, soil sediment, vegetation, livestock, and wildlife in the San Juan River watershed, including wells, irrigation systems, and public water supply systems;
- An on-site laboratory on Navajo land, including funding for staff and sampling, to enable prompt processing and reporting of results;
- Full and immediate data and information sharing by EPA;
- Placement of a water treatment facility at the headwaters of the Navajo Nation and resources to explore alternative water supply systems in the event of an emergency;
- Recognition of the San Juan River's spiritual and cultural significance to the Navajo people;
- Funds dedicated to emergency preparedness for future environmental disasters like the Gold King Mine spill, given the continued threat posed by the Upper Animas Mining District;
- Resources to support the resurgence of farming and farm development along the San Juan River;

- Prompt and judicious review and approval of claims for damages and losses by people and businesses impacted by the Gold King Mine spill, including an interim claims process; and

- Implementation of real-time monitoring and an early warning system for ranchers, farmers, and other water users in the San Juan River watershed to provide notice of impending contamination from spring snowmelt runoff, storm events, and mining discharges that may cause release or mobilization of contaminants in the river system; and

- A formal, public apology from the United States Environmental Protection Agency Administrator McCarthy and President Obama to the Navajo Nation and to all those affected by this human-caused disaster.

D. The Navajo Nation hereby authorizes the Navajo Nation President, the Navajo Nation Speaker, the Navajo Nation Attorney General, and their designees, to advocate for the requested actions and consultations.

CERTIFICATION

I hereby certify that the foregoing resolution was duly considered by the Naabik'íyáti' Committee of the Navajo Nation Council at a duly called meeting in Twin Arrows, Navajo Nation (Arizona) at which a quorum was present and that the same was passed by a vote of 11 in favor and 1 opposed, this 14th day of April 2016.

LoRenzo C. Bates, Chairperson
Naabik'íyáti' Committee

Motion: Honorable Alton Joe Shepherd
Second: Honorable Amber Kanazbah Crotty

Congress of the United States

Washington, DC 20510

March 2, 2016

The Honorable Gina McCarthy
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, DC 20460

Dear Administrator McCarthy:

The spill at Gold King Mine on August 5, 2015 is now over six months old, but the health and financial impacts are very current. We write to you today with concern about EPA's proposed water monitoring plan and to ensure that impacted communities are fully compensated for financial burdens that they incurred during and after the spill.

Resolution on these issues is incomplete. The U.S. Bureau of Reclamation has made clear in their own review that the spill was preventable and caused by the actions of EPA and its contractor on site. As a result of these actions, the governments of the State of New Mexico and the Navajo Nation incurred millions of dollars of expenses responding to the spill. It is our understanding that both governments have conveyed the extent of their expenses to EPA.

Furthermore, the 2016 Omnibus spending legislation directed EPA to coordinate with impacted states and tribes on the development of a robust, long-term plan for independent monitoring. EPA was instructed to use existing funds to provide States and tribes with support for their contribution to monitoring efforts.

We are deeply troubled that these two issues are still far from resolved six months after the spill. The EPA has publicly taken responsibility for the spill and the investigation by the Department of the Interior found that EPA failed to consider complex engineering involved in the blowout and that the blowout could have been prevented. Therefore, we expect that the EPA will compensate victims of the spill for any losses impacting health, property, business and personal finances under the Federal Tort Claims Act.

We expect EPA to respond quickly to the State of New Mexico and the Navajo Nation on their requests for reimbursement and for EPA to support the state of New Mexico's long-term water-quality monitoring plan to ensure that public health is protected. Very soon the spring snowmelt will dramatically increase water flow to the region. We feel strongly that the water and soil

should be remediated and heavy metals removed before further contamination is spread. The EPA should reprogram funds or use other means to ensure that a plan acceptable to the state of New Mexico is implemented as soon as possible to protect the health and safety of downstream users

Finally, we urge EPA to set up an Office of Gold King Mine Spill Claims to begin processing compensation for victims. Many are still feeling the economic impacts and health uncertainties of the spill and need a better process for processing claims. In particular, we believe EPA should work with Tribes to designate a special liaison within the Office of Gold King Mine Spill Claims to work specifically with impacted tribal communities; EPA should expedite claims to victims; and EPA should ensure that victims are not prevented from submitting claims in the future as new damages are discovered.

Thank you for your attention to these matters.

Sincerely,

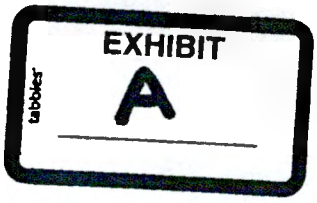
Tom Udall
United States Senator

Martin Heinrich
United States Senator

Steve Pearce
United States Representative

Ben Ray Luján
United States Representative

Michelle Lujan Grisham
United States Representative



GOLD KING MINE – WATERSHED FACT SHEET

Site Names: Upper Animas Watershed, Upper Cement Creek
City: Silverton
County: San Juan
Location: latitude: 37.8945° N; longitude: 107.6384° W; approximately 11,000 feet elevation

HISTORICAL BACKGROUND:

The Gold King Mine (GKM) was discovered by Olaf Nelson in 1887, with operations continuing until 1907 when a fire destroyed the surface buildings of the mine. The mine was reopened in 1910 but closed shortly thereafter because of litigation and labor problems. In 1918 a new company bought the mine and operated it until the fall of 1922. The GKM shipped 711,144 tons of gold and silver ore while in operation. The mine has been inactive since then. It is currently owned by San Juan Corporation.

The GKM is located in the Upper Animas Watershed in southwestern Colorado. These watersheds within the volcanic terrain of the San Juan Mountains contain some 400 abandoned and inactive mine sites, which have been the focus of both large- and small-scale mining operations between 1871 and 1991.The watershed consists of three main streams, the Animas, Cement Creek and Mineral Creek all of which drain the Silverton Caldera. The Animas River and many of its tributaries are historically impacted by high concentrations of heavy metals from both acid rock/mine drainage at mine sites and from naturally occurring metal loading sources not impacted by mining.

Mining operations contributed to metals loading to alpine streams and creeks adding to the natural metal loading already occurring in the mineralized area. As a common practice, mine tailings were directly deposited into the creeks and rivers until the 1930's. Water draining from the mines occurs when mining operations in the mountainsides alter the hydrology of the area and combine with natural springs, pulling water into mine tunnels. The water reacts with iron disulfide (pyrite) and oxygen to form sulfuric acid (acid rock/mine drainage). The resulting acidic water dissolves naturally occurring heavy metals such as zinc, lead, cadmium, copper and aluminum and results in water containing these metals flowing out of the mine adits (a horizontal shaft into a mine, which is used for access or drainage).

By the end of mining operations, many of the mines were left discharging contaminated water into streams. In 1991, the last big mine in the region, the Sunnyside, stopped mining. Its owner, Sunnyside Gold Corp., agreed not only to bulkhead (mine plug) its mine, but also to clean up abandoned mines nearby, while continuing to run the metal-laden waters of upper Cement Creek through a water treatment facility.

Sunnyside also reached an agreement with the state and Gold King mining to turn over its water treatment operations to Gold King. At that time, the GKM, like the nearby Red and Bonita mine, had not discharged any water. However, after Sunnyside closed, water found natural fractures that allowed it to flow into the GKM and Red and Bonita mines. Initially, these waters were run through the treatment plant that Sunnyside built, but Gold King ran into technical, financial and legal troubles and the treatment plant stopped operating.

The GKM is one of an estimated 23,000 abandoned mines dotting the state of Colorado. Of these abandoned mines, 6,127 have been made safe by the Colorado Division of Reclamation, Mining and Safety.

PREVIOUS WATER RELEASE INCIDENTS IN THE AREA:

1975 – A tailings pile on the banks of the Animas River northeast of Silverton was breached, dumping tens of thousands of gallons of water, along with 50,000 tons of heavy-metal-loaded tailings into the Animas.

1978 – Sunnyside Mine worker breached the floor of Lake Emma sending an estimated 500 million gallons of water through the mines, sweeping up huge machinery, tailings and sludge, and ultimately releasing through the American Tunnel to downstream waters.

SITE ASSESSMENT:

EPA and the Colorado Department of Public Health and Environment (CDPHE) conducted a Superfund Site Assessment of the area in the 1990s. The assessment showed that water quality standards were not achieved in the Animas River near Silverton and identified the severe impacts to aquatic life in the Upper Animas and its tributaries from naturally occurring and mining-related heavy metals. In recognition of the community-based collaborative effort, EPA agreed to postpone adding all or a portion of the site to the Superfund NPL, as long as progress was being made to improve the water quality of the Animas River.

Until approximately 2005, water quality in the Animas River was improving. However, since 2005, water quality in the Animas River has not improved and, for at least 20 miles below the confluence with Cement Creek and the water quality has declined significantly. Impacts to aquatic life were also demonstrated by fish population surveys conducted by Colorado Parks and Wildlife, which found no fish in the Animas River below Cement Creek for approximately two miles and observed precipitous declines in fish populations as far as 20 miles downstream since 2005.

Because of this declining water quality in the Animas River, in 2008, EPA's Superfund Site Assessment program began investigations in Upper Cement Creek focused on evaluating whether the Upper Cement Creek area alone would qualify for inclusion on the NPL. This evaluation indicated that the area would qualify, although after receiving additional community input, EPA postponed efforts to include the area on the National Priorities List. Since that time, EPA has continued and broadened its investigations of conditions at the site in order to understand the major sources of heavy metal contamination in the Upper Animas.

SITE RISK:

Mining operations have greatly disturbed the land, adding to existing highly mineralized conditions in many areas of the site. Mineralized waste rock exposed to air and water causes acidic conditions to mobilize the release of heavy metals to the surrounding environment. These heavy metals have found their way into the Animas River and its tributaries and have eventually traveled farther downstream.

Media Affected	Contaminants	Source of Contamination
surface water, subsurface water, surface soils and stream sediments	heavy metals – aluminum, lead, zinc, cadmium, copper, iron and manganese	historic mining activities and naturally occurring mineralization

CLEANUP PROGRESS:

Numerous mine reclamation and mine waste cleanup projects have been completed in the Upper Animas watershed over the last 20 years. These efforts have included diverting runoff away from and capping mine waste piles, moving mine waste piles away from drainages, consolidating mine waste piles and re-vegetating mine waste piles.

OTHER CLEAN UP EFFORTS:

The Animas River Stakeholders Group (ARSG), a collaboration between concerned citizens and representatives from industry and federal and state agencies, was created in 1994 to address the water discharges. The ARSG, along with federal and state agencies, continue to work to clean up the mines.

In addition, ARSG has been using a watershed approach and has developed a remediation plan, recommended feasible water quality standards (which were adopted in 2001) and has implemented remediation projects throughout the Upper Animas River Basin.

Menu

EPA United States Environmental Protection Agency

EXHIBIT
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Emergency Response to August 2015 Release from Gold King Mine

On August 5, 2015, EPA was conducting an investigation of the Gold King Mine near Silverton, Colorado, to:

assess the on-going water releases from the mine,
treat mine water, and
assess the feasibility of further mine remediation.

While excavating above the old adit, pressurized water began leaking above the mine tunnel, spilling about three million gallons of water stored behind the collapsed material into Cement Creek, a tributary of the Animas River.

EPA is working closely with first responders and local and state officials to ensure the safety of citizens to water contaminated by the spill. The agency has activated its Emergency Operations Center to ensure coordination among its regions, laboratories and national program offices in Washington DC. EPA is closely coordinating with the officials in Colorado, New Mexico, Utah, Southern Ute tribe and Navajo Nation. EPA is taking the lead on efforts to contain the leak and flow from the mine is now controlled. EPA has also deployed federal On-Scene Coordinators and other technicians in Colorado, New Mexico and Navajo Nation to assist with preparations and first response activities in these jurisdictions. EPA is sharing information as quickly as possible with the community as experts work to analyze any effects the spill may have on drinking water and public health.

Photos related to Gold King Mine response

EXHIBIT
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WESTON SOLUTIONS

START 4 - REGION 8

DRAFT TECHNICAL MEMORANDUM

TO: [redacted] EPA Region 8, On-Scene Coordinator

FROM: [redacted], Superfund Technical Assessment and Response Team (START)

DATE: August 12, 2015

SUBJECT: Gold King Mine Investigation and Blowout Event

The United States Environmental Protection Agency (EPA) tasked the Weston Solutions, Inc., (WESTON) Superfund Technical Assessment and Response Team (START) under Technical Direction Document (TDD) #1408-01 to support U.S. EPA's efforts at the Gold King Mine site near Silverton, San Juan County, Colorado. The EPA was investigating the mine due to its proximity and potential for increased flows in relation to the bulkheading of the Red and Bonita Mine located on the same mountain (Bonita Mountain).

2015 Field Activities Prior to Blowout

START [redacted] the EPA On-Scene Coordinator [redacted] and EPA's Emergency and Rapid Response Services (ERRS) contractor Environmental Restoration, LLC [redacted] visited the Gold King Mine on June 24, 2015 to document current flows and seek a viable path to pipe water from the Gold King to the Red and Bonita water treatment system. Gold King Mine discharge flow measured 31 gallons per minute (gpm). START planned to collect Gold King discharge water quality data and a sample on June 25, 2015, but due to deteriorating snow pack, no safe path existed to reach the site and no sample was collected from the Gold King mine discharge.

START [redacted] remobilized to the Red and Bonita and Gold King sites on July 13, 2015. On July 15, Gold King Mine discharge flow and water quality parameters were measured and a water sample was collected from the discharge. Gold King Mine discharge flow measured 69 gpm. Samples were not delivered to the laboratory by FedEx until July 20 and the temperature of the samples exceeded the hold requirements. The sample results are pending.

On July 23, 2015 START visited the Gold King Mine to measure discharge flow in the existing flume and discuss installing a sump basin to treat water that would be pumped from the mine for work scheduled to begin in August. It was decided a 5 foot or 6 foot HDPE pipe would be set on end in the ground and a 12 inch HDPE pipe would be used to allow flow to follow the natural flow path over the eastern end of the mine dump when water treatment was unnecessary. On July 24, the ERRS contractor began grading the mine dump and excavating a trench to install the sump basin. START brought a transit on site to verify elevations. Gold King Mine discharge flow measured 69 gpm.

By July 28, 2015 the sump basin and outflow pipe were installed and connected and work on the filter bag alternative for Gold King was being discussed and outlined.

On July 29, 2015 the pipeline and pump supplier visited the site to discuss options for pumping water from the Gold King to the Red and Bonita treatment ponds. Various options were considered and the vendor planned to supply the ERRS contractor with options. That afternoon the ERRS contractor removed some loose material from above the assumed portal location in an attempt to find native bedrock.

On July 30, 2015 the ERRS contractor had removed material above the collapsed pipes to the back of them, leaving the top of the top pipe covered and ceased investigation. Grading for the filter bag setup began.

On July 31, 2015 the ERRS contractor began laying out the manifold system for the filter bag system to provide backup water filtration at the Gold King Mine during the anticipated 2015 mine work.

On August 3, 2015 the ERRS contractor continued work on the filter bag manifold and grading to allow the filter bags to drain into the half channel at Gold King.

On August 4, 2015 EPA OSC [redacted] arrived on site at 08:45 and [redacted] from Colorado Division of Mining Reclamation and Safety (DRMS) arrived at the Gold King Mine at 09:45. [redacted] discussed how to proceed with the site. Per their instruction, the ERRS contractor began excavating the collapse area while minimizing water discharge at 10:30. At 14:00 the excavation was proceeding slowly, and at 16:00 a set of collapsed timbers with what appeared to be an opening was uncovered. The situation was left to be considered overnight.

Field Activities on the Day of the Gold King Mine Blowout – August 5, 2015

Below is a summary of the START field notes and recollection of site activities at the Gold King the day of the mine blowout.

09:00 EPA OSC [redacted] and ERRS contractors were up at the Gold King Mine. Due to excavation activities, the GSA Suburban was parked at the toe of the mine dump.

09:30 DRMS personnel [redacted] and the EPA OSC [redacted] discussed the mine adit situation and determined that excavation should be continued. DRMS said due to the severity of the collapse a series of plates might need to be used to build the 10 foot culvert further back into the mine beyond the collapse to allow dewatering and water treatment.

10:30 (approximate) DRMS left the site to investigate the bulkhead in the nearby Mogul Mine.

10:51 A small leak was observed approximately 15 to 20 feet above the anticipated elevation of the floor of the adit. Work stopped and the excavator moved back from the excavation area.

10:54 The hole had begun to enlarge and water was pouring out.

10:58 The hole had expanded significantly, later measured at about 10 feet wide by 15 feet high. Portions of the mine tailings dump and access road had begun to wash away. At this time START realized that the GSA Suburban had been parked at the toe of the mine tailings dump where much of the

discharged water had flowed. The vehicle was later found it to be water damaged, would not start, and was un-drivable.

11:33 pH testing (using pH indicator paper) of mine discharge water showed a pH of approximately 4.5.

11:40 Mine discharge flow had slowed enough to be safely diverted into the existing culvert system.

11:45 DRMS personnel reported by radio that they were out of the Mogul and left the site to notify local resources and the EPA.

11:50 [redacted] and the ERRS contractor manager [redacted] left the Gold King on foot to get picked up and driven to an area with phone reception to notify authorities. The START contractor [redacted] stayed at the mine adit area to monitor the mine for additional surges of water and to provide support to the ERRS operator rebuilding the road.

12:20 The ERRS contractor began reconstructing the exit road from the site to help demobilize the equipment, vehicles, and personnel.

12:30 According to radio communications, ERRS personnel working at the nearby Red and Bonita site submitted a call for Flight for Life assistance because a tourist had injured themselves on Corkscrew Pass. This call was not related to the Gold King Mine incident.

13:30 An unknown visitor drove up the Gold King Mine Road and viewed the site for 15 minutes then left.

14:00 The discharge water flow steadily declined until this point and then appeared to stabilize.

14:15 The flight for life helicopter flew by the site.

15:00 The pH of the discharge still measured approximately 4.5 on pH indicator paper.

15:05 DRMS personnel returned to the site.

15:20 The ERRS contractor had reconstructed a temporary road for all equipment and personnel to be moved off site.

15:30 – EPA, DRMS, ERRS, and START viewed the portal area. DRMS measured the width of the portal to be approximately 10 feet.

17:00 – The water treatment system at Red and Bonita was decontaminated and stored for the evening.

18:00 – The ERRS contractor gave the START contractor a ride to his lodging.

2015 Field Activities Post Blowout (Through 8/8)

START has been monitoring flow rates, checking pH of the mine discharge, and assisting with water treatment. The Gold King Mine discharge pH has been approximately 3 (as measured by a Horiba water quality meter) and the flow rate decreased from 748 gpm to 587 gpm as of August 8.

Water treatment consisted of adding sodium hydroxide (25% solution) at a rate of 2 liters/minute and adding approximately 10 ounces of powdered Brennfloc every 10 minutes to the half pipe channel outside the Gold King Mine. A treatment option including lime for pH adjustment was being considered.

Task Order Statement of Work
EPA Region 8 ERRS Contract No. EP-S8-13-02
Environmental Restoration, L.L.C.
06/25/14

Name: Gold King Mine
Task Order No.051

On-Scene Coordinator: [redacted]

Site Name: Gold King Mine
Superfund Site ID (SSID): 085M (OU01)
Federal Project Number (FPN): Not Applicable
City/County/State: Twp. 42N, R7W, NMPM, San Juan County, Colorado

Removal Type: Time Critical Removal
Funding Source: Removal Assessment
Anticipated Start Date: 07/07/2014
Anticipated End Date: 12/01/2014

The conditions at the Gold King Mine present an endangerment to human health and the environment and meet the criteria for initiating a removal action under 40 CFR section 300.415(b)(2). All activities directed by EPA's On-Scene Coordinator must remain consistent with The National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300).

Background

The Gold King Mine location in Twp. 42N, R7W, NMPM, San Juan County, Colorado is characterized by a mine discharge that is a significant contributor of manganese, copper, zinc and cadmium into the Cement creek drainage of the Animas River watershed.

The Gold King Mine has not had maintenance of the mine working since 1991, and the workings have been inaccessible since 1995 when the mine portal collapsed. This condition has likely caused impounding of water behind the collapse. In addition, other collapses within the workings may have occurred creating additional water impounding conditions. Conditions may exist that could result in a blow-out of the blockages and cause a release of large volumes of contaminated mine waters and sediment from inside the mine, which contain concentrated heavy metals.

The Division of Reclamation, Mining and Safety (DRMS) performed work under a bond to stabilize the existing adit opening to allow mine water drainage. The flow exits the mine through a culvert pipe and enters a concrete flume on the waste dump surface and flows to half pipe culvert eventually discharging to the North Fork Cement Creek. The existing conveyance channel shall be protected and maintained during the work. If it becomes necessary to remove these drainage features, then suitable measures must be installed to control flows during the work. A replacement conveyance system is required to be installed after the portal and

underground work are completed.

It is proposed to re-open the Gold King Mine portal and workings to investigate the conditions to assess the on-going releases. This will require the incremental de-watering and removal of such blockages to prevent blowouts. The work is intended to take place in September-October, 2014.

In addition, the secondary purpose of the work is to attempt to identify and characterize specific water flows into the mine and evaluate potential means to mitigate those flows if possible.

Objectives

The work will be conducted by qualified contractors with the assistance and cooperation of the landowner, San Juan Corp. In addition to compliance with applicable OSHA standards, the work is to be conducted in compliance with appropriate Mine Safety and Health Administration (MSHA) regulations inclusive of establishing a safe underground working environment for personnel and the rehabilitation of underground workings and escapeways. (Note: MSHA regulations are not applicable to inactive mines; however certain standards are relevant to the propose work.)

All work will be performed under the conditions as described in an approved Work Plan to be submitted to the OSC for approval that will be prepared by the Contractor and submitted to the Agency before mine rehabilitation work begins.

The purpose of this Removal Work is to complete the following tasks;

Site Preparation:

Roadways and staging areas will be prepared to allow for safe access to the work area for heavy equipment and vehicles. Building debris and structural hazards will be removed or secured to eliminate physical hazards associated with such.

Water management systems will be set up and operational before any construction work begins. Initial measures must include standard best management practices (BMPs) for stormwater run-off along roads requiring improvement. Mine water management is required to prevent additional impacts from release during performance of work under this scope. Appropriate plans to manage the water must be developed and included in the work plan.

Portal Rehabilitation:

Engineering specifications and geotechnical assessment of the structural requirements to stabilize the portal structure and underground support systems must be provided. The appropriate engineered specifications must be developed including typical designs for structural support systems (e.g., steel sets, and arch supports and timbers), identify the materials and construction requirements for structural supports. In addition, specify the anticipated approach for removing overburden, debris and re-establishing a safe structure that can be used for entry and egress and

secured when not in use. This includes installing a portal gate with a secured locking system.

Measures will be taken to control water and metal precipitate sludge and sediment that are impounded behind any blockage at the portal or in the mine. This will include the treatment of surge water discharge as necessary to prevent an uncontrolled release and impact to surface water.

Underground Work:

Adit rehabilitation includes removing the collapsed structures and colluvial overburden blocking the historic adit opening. This must be performed by an experienced contractor with required mine safety training for working underground. Standard measures for communication, ventilation and power will be provided for crews as necessary.

Collapse blockage material removal will be performed in a controlled manner in odor to control the rate of release of water and allow for appropriate treatment and sludge management. This is to include the ability to pump water from behind the blockage and lower the water level in a controlled manner before the blockage is destabilized by removal of material.

This scope includes the plan to rehabilitate as far in as 75 feet inby of the portal opening. Underground conditions are uncertain, and the amount of blockage is not known. The initial objective is to establish a portal shed structure for safe access to the underground workings and continue rehabilitating the workings as needed for 75 feet, if this is determined possible. Beyond that point, a determination will be made as to what additional work is required to allow safe access into the mine. As determined appropriate by the OSC, work may continue on an incremental basis to install the necessary structural supports as specified.

All materials and equipment necessary to implement this work will be present on site and inspected before operations are initiated.

Water Treatment:

A temporary water retention and sludge management pond must be prepared and operated, as necessary, on site to manage mine water and sludge removed from the adit. This will be used to manage impounded mine water and base flows and metal precipitate sludge from the mine workings during the construction activities. If necessary, water treatment may include pH adjustment and flocculent to assist precipitation/settling of elevated metals levels to meet existing water quality in the discharge from the mine. (The START contractor is responsible for overseeing the water treatment operations and for all environmental data, including sampling, associated with the water treatment objectives and activities.)

Site Stabilization:

The site work area must be graded and appropriate erosion control measures must be in place

before demobilizing. This will include appropriate BMPs for construction site stormwater controls and post construction stabilizations. These are to be specified in the Work Plan submitted to EPA.

Reporting

A final report is required to include a description of the work performed with detailed information on the distances underground accessed and the number of structures installed. A description of all materials used in the support structures and quantifies of material removed and locations where it is placed are required. List all the equipment use and personnel involved in the operation. A description of the water management system is also to be included. The report is to be provided within 60 days of demobllizing.

Data Requirements

All environmental data including site characterization and waste characterization, mitigation, and disposal that is collected, generated, and used will be documented by the START 4 contractor in accordance with the Weston Quality Management Plan (QMP) Sections 2.3 and 7.0 (May 2013). The ERRS contractor will not be gathering the environmental data.

Hazardous categorization of wastes? No.

Activities Under Contract Statement-of-Work: The contractor shall accomplish the following tasks as required under the Contract:

1. Project Planning (SOW II.A.l)

   - Provide a detailed work plan to accomplish the project in the most effective, efficient and safe manner based on existing information. This work plan shall, at a minimum, define the types and quantities of cleanup personnel, equipment and materials that will be needed, the proposed project schedule by sub-task, and the estimated cost.

   - Provide a detailed Health and Safety Plan to protect the workers on-site from the hazards with the contaminants and physical threats associated with the removal actions.

2. Containment, Countermeasures, Emergency and Removal Response (SOW II.A.2)

   NA.

3. Decontamination, Response Mitigation (SOW II.A.3)

   - Provide for appropriate removal of contamination if appropriate, in consultation with the OSC.

4. Treatment and Transportation and Disposal Operations (SOW I I.A.4)

- Provide for appropriate disposal and transportation of all contaminated debris, if appropriate. Treatment of the water may be required, however will be overseen and managed by the START contractor.

5. Restoration and Soil Stabilization (SOW II.A.5)

- Provide for appropriate refurbishment of affected areas, as appropriate and in consultation with the OSC.

6. Analytical Services (SOW I I .A.6)

- NA.

7. Demolition Services (SOW I I .A.7)

- N/A

8. Construction and Support Facilities in Support of Removal Actions (SOW II.A.8)

- Provide for office trailer, including support equipment, communications, power, as needed.

9. Marine Operations (SOW II.A.9)

NA.

10. Trans-boundary Response (SOW II.A.10)

NA.

11. Response Times (SOW II.A.11)

NA.

12. Regional Cross-Over (SOW II.A.12)

NA.

Deliverables

Detailed Work Plan	08/22/2014
Health and Safety Plan	NLT the Date of Mobilization
Construction & Implementation	N/A
Daily Work Orders	Daily
Daily Cost Summary Reports (55s)	Daily
Removal Activities Report	NLT 30 days after Demobilization
Final Daily Cost Summary Report (55s)	NLT 90 days after Demobilization

Schedule

The work plan preparation is expected to begin on July 7, 2014, and the current estimated schedule is to begin work onsite is September 3, 3014. A work plan must be submitted to EPA by August 22, 2014. The Task Order expiration is set for December 1, 2014.

Other Task Order Requirements

1. Provide for application of Service Contract Act Labor rates and David-Bacon Labor rates in consultation with the R8 ERRS Contracting Officer.

2. Provide all site cost documentation within 90 days after demobilization date, with the exception of 'pending costs.' Use RCMS Windows Version 2.0 for Site cost accounting purposes.

EXHIBIT "E"

Gold King Mine Acid Mine Drainage Release:

DRAFT Analysis of Fate & Transport of Metals in the Animas & San Juan Rivers

Animas River Team
National Exposure Research Lab/EPA
February 5, 2016

Analysis Objectives

Characterize the release, transport and fate of approximately 3 million gallons of acid mine drainage (AMD) released from the Gold King Mine (GKM) on August 5, 2015.

- Focus on suite of metals such as cadmium, copper, lead, mercury, nickel, and zinc.

- Identify potential for water quality impacts, including municipal wells, and implications for future monitoring priorities

Key Definitions:

Plume – the section of river containing contaminants released from the Gold King Mine. The plume moves downstream over time.

Dissolved metals – metal ions that are part of the liquid solution.

Colloidal and particulate metals – small particles including metals, which are dispersed in a liquid solution, e.g. milk or paint.

Preliminary Key Findings

- Preliminary estimates indicate more than 400,000 kg of metals entered the Animas River from the Gold King Mine release. Less than 2% of the total was dissolved metals and the remainder were in a colloidal form.
- Much of this total metal load was picked up from Cement Creek as the 3 million gallons of AMD traveled from the GKM to the Animas River.
- We estimate that, by the time the plume reached the lower Animas River, the metal load in the plume was roughly equivalent to one day's worth of high spring runoff of AMD discharges into the Animas River from all existing AMD sources in the Animas River watershed.
- GKM monitoring suggest hot spots of metal contaminants in the lower Animas and San Juan Rivers unrelated to the GKM release that may warrant further investigation

Preliminary Key Findings

- The Animas River naturally diluted the plume as it travelled downstream. The mixing of the plume with more basic water lowered acidity (increased pH) and triggered chemical transformation of the dissolved metals to colloidal and particulate metals.
  - We estimate that 100% of the dissolved metals from the Gold King Mine were transformed to colloidal or particulate metals (the intense yellow color) by the time the plume reached the San Juan River.
  - Elevated dissolved metal concentrations in the Animas River returned to background levels within a day after the plume passed.
  - We estimate that the majority of the total metal load was deposited in the Animas River riverbed before joining the San Juan River. Some of the total metal load entered the San Juan River.
- EPA groundwater modeling suggests that municipal wells that located in the floodplain near the Animas River (within ~100 m) that were pumping have the potential to draw river water, possibly including dissolved metals associated with the plume passage.

Background Sources of Metals

- United States Geological Survey (USGS) studies of AMD in the Animas River in the 1990's found that increased colloidal & dissolved metal concentrations were common in the river following storms and spring snowmelt due to ongoing AMD contamination from the high density of abandoned inactive mines in the headwaters
  - Streambeds accumulate metals from AMD during periods of low flow and release accumulated loads of metals during periods of high flow
  - It may not be possible to isolate the specific effects of the GKM event from the ongoing cumulative effect of multiple sources of metals from past or future runoff

Methods

- We analyzed water quality & hydrologic data collected during and after the GKM release to estimate metal concentrations and loadings downstream as the plume passed.
- We used publicly available data from multiple sources to characterize the GKM release and applied existing, peer-reviewed models to assist understanding of transport and fate
- We reviewed USGS studies of AMD in the Animas River in the 1990's to gain insight into system behavior and expected future conditions
- We consulted with EPA regions and program staff with detailed knowledge of the event to cross check and validate results

Methods

MODELING

- Purpose of modeling:
  - Establish timing of plume movement and transport of metals in surface and groundwater
  - Estimate possible magnitude of concentrations and chemical transformations not completely sampled during the fast-moving plume event
  - Identify & prioritize areas for further follow up and monitoring

- Applied established peer reviewed EPA models:
  - WASP (Water Quality Analysis Simulation Program): to analyze transport of metals through rivers;
  - WhAEM: to examine groundwater transport & connection of wells to the river;
  - EnviroAtlas: for data gathering and geospatial analysis

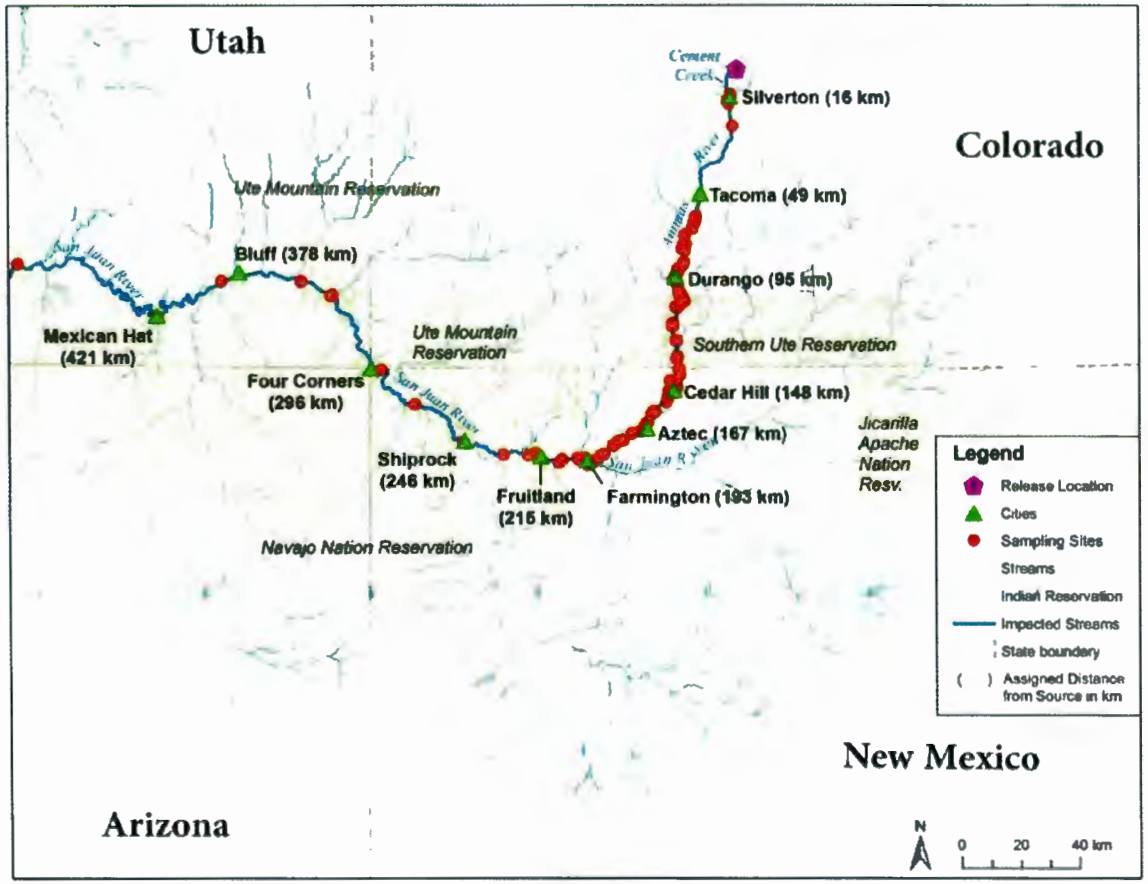
- Used USGS PHREEQ model to assist with geochemical analyses

Methods

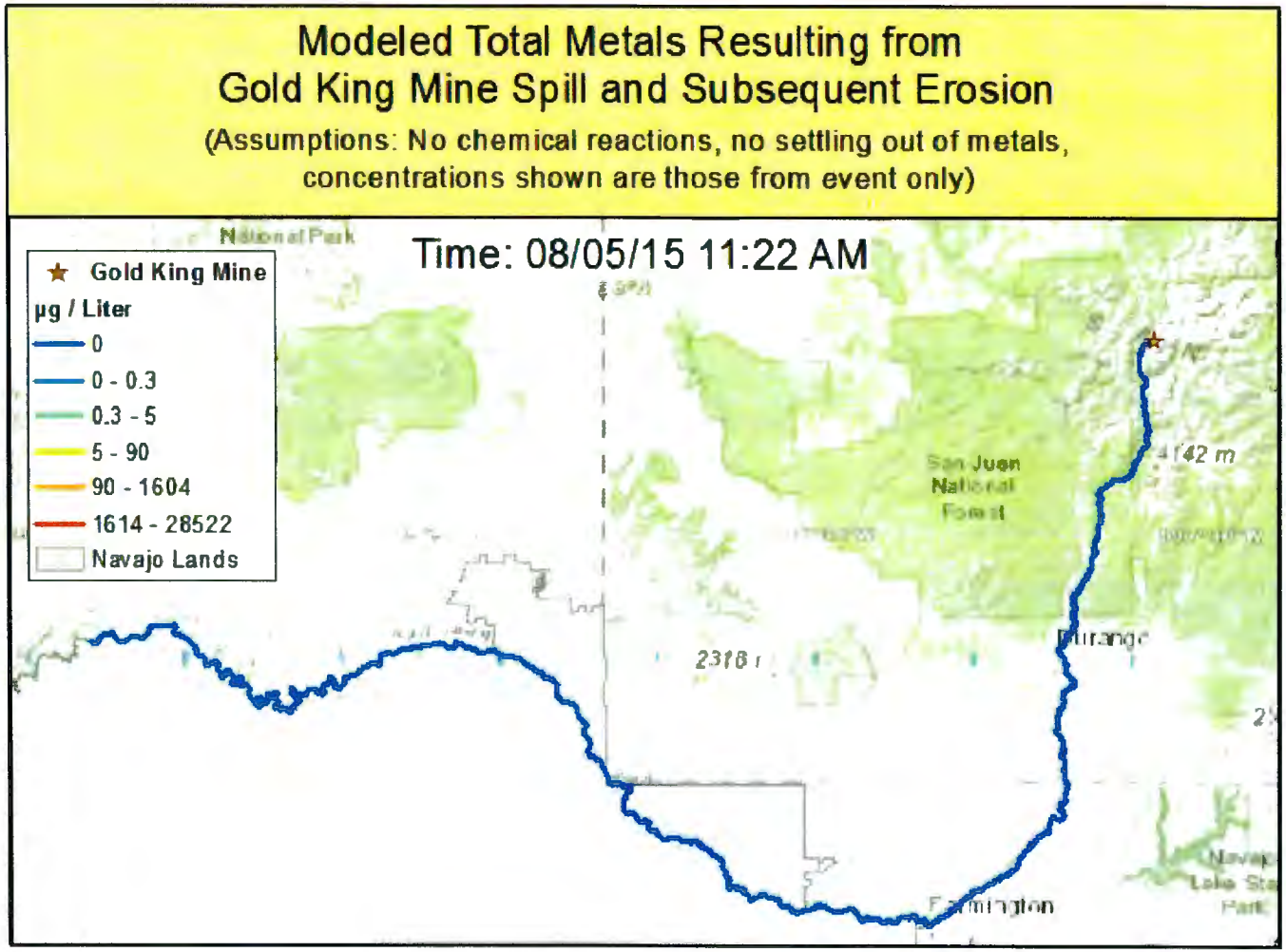
Used publicly available data accessed from agency websites

- EPA Regions 8,6, and 9
  - Surface water and and sediments sampled before and during GKM plume and on a daily basis after
  - Over 600 surface water samples in first month
  - Drinking water well data
- Colorado DPHE
  - Water quality at mine source and headwaters of Animas
  - Well data from 5 municipal wells
- New Mexico Environment Dept water quality during plume
- USGS hydrology data
- USGS historical studies of AMD in the Animas River

EPA and State monitoring response to the GKM release enabled understanding of the dynamics of water quality impacts on a large scale.

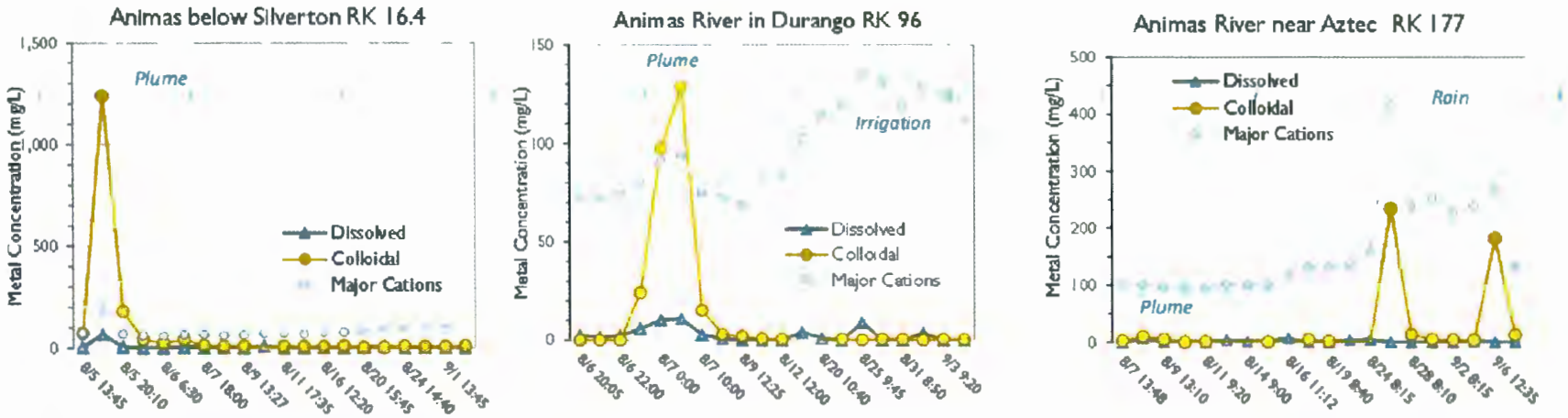


Plume Simulation



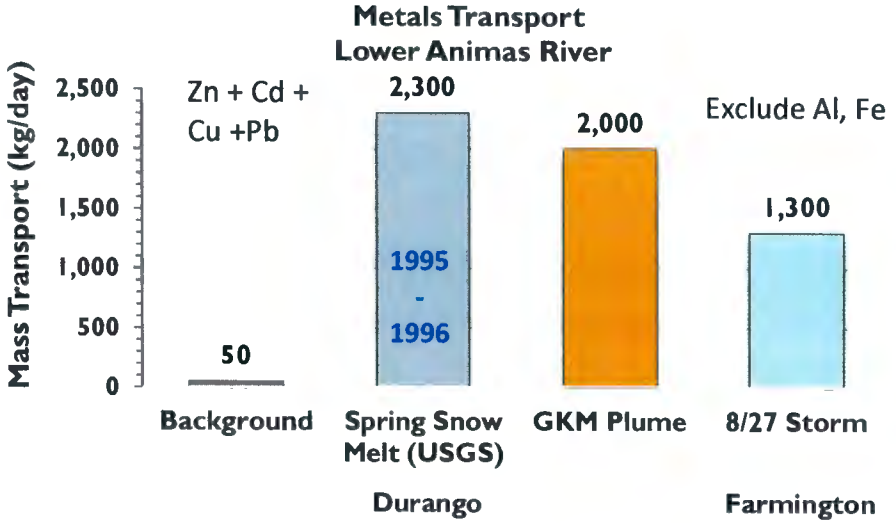
Characterize Transport and Fate of AMD – Animas River

- Monitored data showed significant decline in dissolved metal concentrations with increasing distance from mine.
- There was consistency between modeling results and monitored data
- GKM dissolved metals concentrations returned to background within hours after the plume passed at all sites



Implications for Monitoring Going Forward

- **USGS sampled metals in the Animas during spring runoff in 1995-96 finding that the Animas River carries large metal loads during high streamflow**
  - Mostly colloidal (85-99%)
  - Some dissolved (1 – 15%)
- **The GKM plume was similar to a day of high spring runoff for combined metals.**
- **Monitoring can expect high metal loads during rain and snowmelt and will need to account for the complexity of contributing sources in the watershed**
- **GKM contaminants may be difficult to isolate during future high runoff from existing and ongoing AMD contamination.**

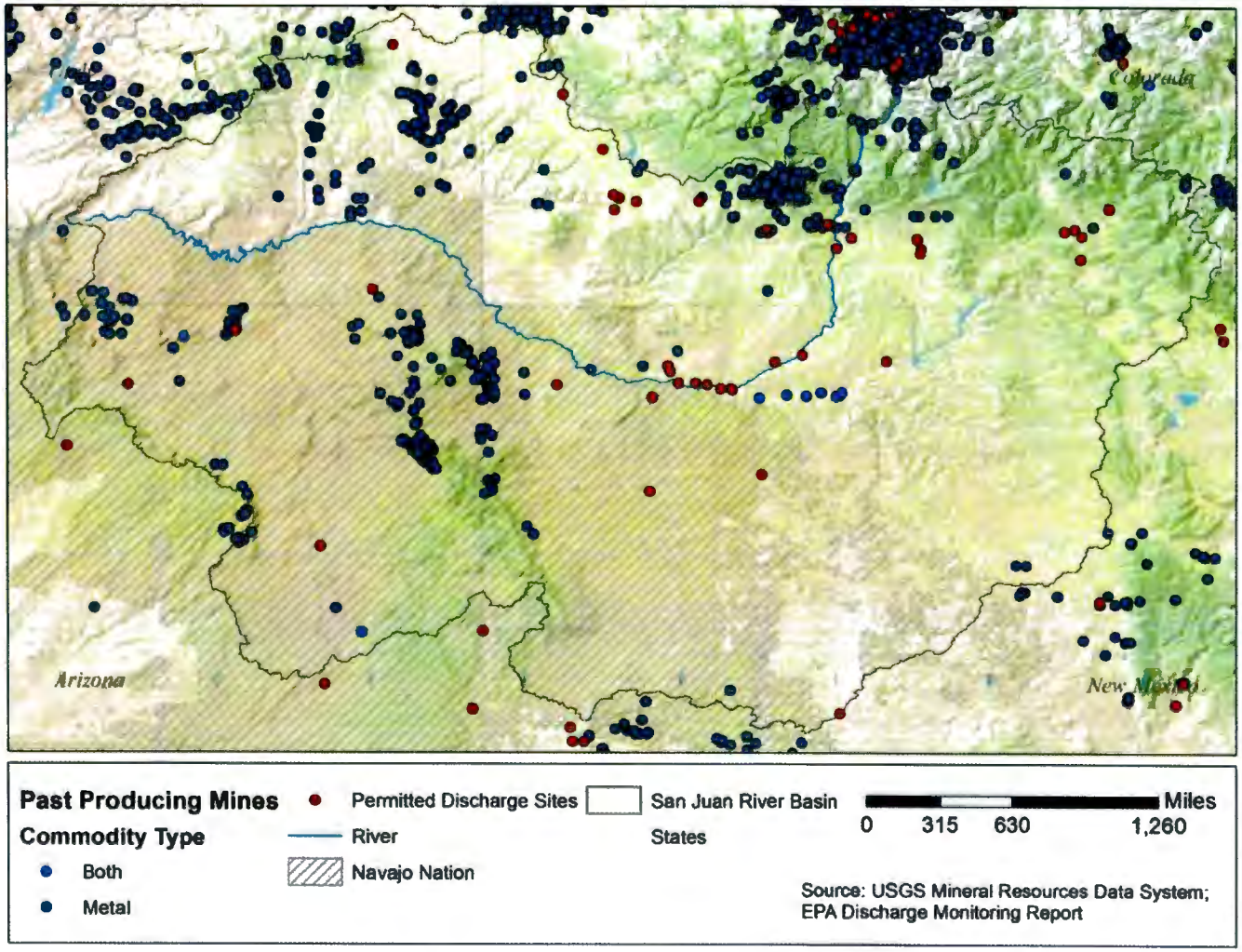


GKM metal load in the lower Animas was similar to one day of high spring runoff

Implications for Monitoring Going Forward

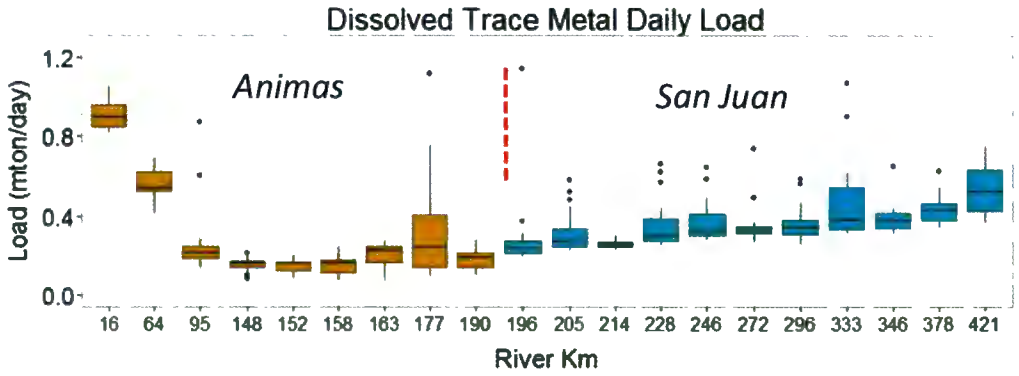
Possible contributers to metal loads in the lower Animas and San Juan during high runoff

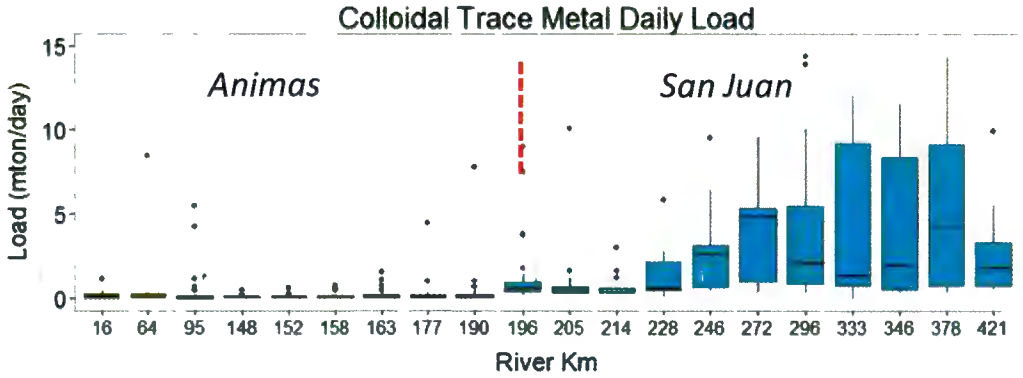
- Natural differences in geology/sediments
- Permitted dischargers
- Historic ore processing facilities
- Ongoing AMD from hundreds of abandoned mines



Characterize Transport and Fate of AMD

Trace Metals
Surface Water in the San Juan





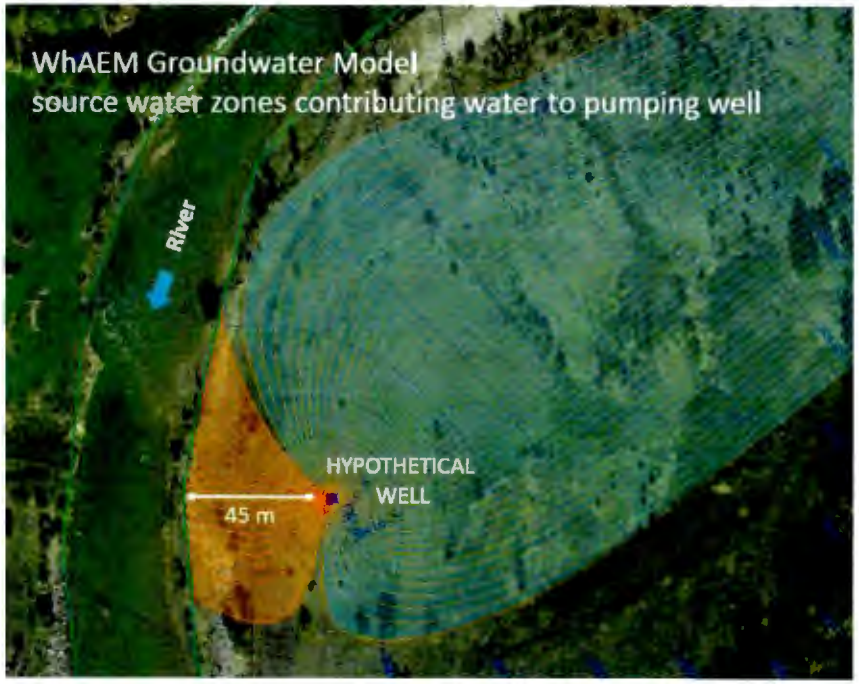
Boxplots show range of data and median and quartiles at each monitoring site collected during August

- Dissolved and colloidal trace metal loads increase within the San Juan River as it flows westward
  - During GKM plume
  - Late August storms
- Suggests other sources contribute to metal loads in San Juan
- Monitoring will need to be designed to improve understanding of sources

Potential Impacts on Wells

Which wells located in the Animas River floodplain have the potential to draw water from the river?

- **Rivers and groundwater in alluvial floodplains exchange water**
  - **most of the time, groundwater feeds rivers**
  - **pumping wells located in the floodplain can draw in river water**
- **WhAEM model used to inform:**
  - **capture zone of pumping wells**
  - **particle tracking representing solute movement from river to well**



Could those wells have acquired contaminated water from the river?

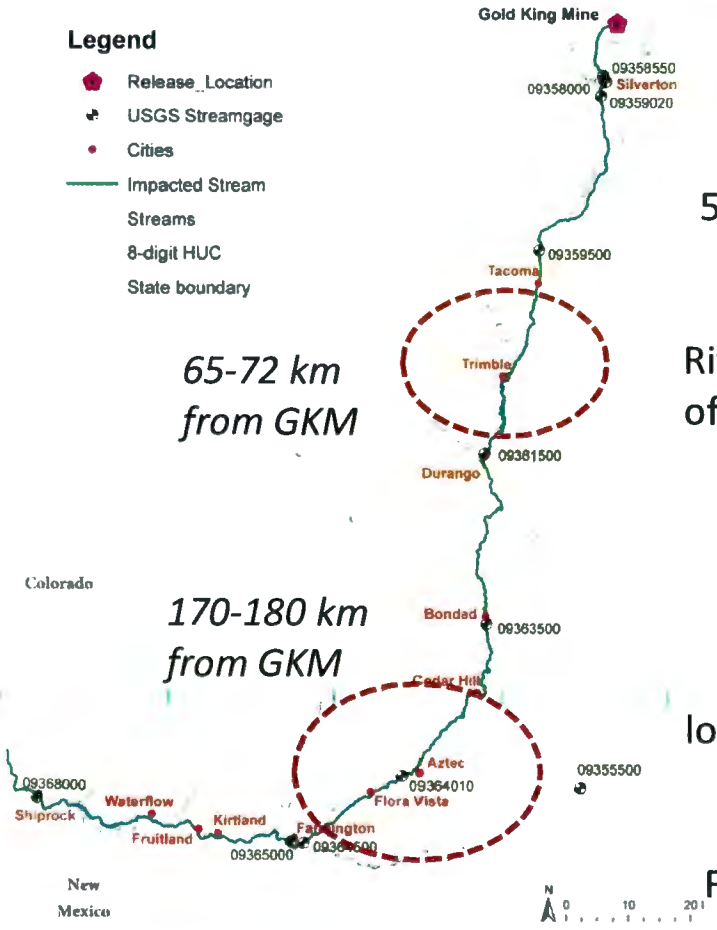
- **WhAEM model used to inform:**
  - **break-through from Animas River to well given pumping**
  - **likely time frame and strength of signal**

Influencing Factors:

- *Proximity to river*
- *Pumping volume (we tested for typical annual diversions and maximum rated yield)*
- *Pumping schedule (municipal wells pump more consistently than irrigation wells)*

Selecting Wells for Simulation Study

- **Selection Criteria**
  - Municipal wells only
  - Within 1,000 m of Animas River
  - Located within the alluvial floodplain
  - Sufficient available data to calibrate the model
    - Pump tests
    - Drillers logs
  - Available water quality sampling post- plume (preferred)
- **Identified Sites**
  - 5 wells located north of Durango, CO
  - 5 wells north of Farmington NM near Flora Vista and Aztec



5 wells in mid-Animas River north of Durango

5 wells in lower Animas River Aztec, Farmington area

Next Steps for Analysis

- The analysis and results presented here will be peer reviewed by an external review panel during the week of February 22, 2016
- The peer review report is expected to be complete by mid March
- We have a more detailed technical version of this presentation available and are happy to offer further briefings if requested

NAVAJO NATION

Spring 2016
http://www.navajo-nsn.gov/

SPRING 2016 SAMPLING IN RESPONSE TO THE GOLD KING MINE RELEASE

On August 5, 2015 United States (U.S.) Environmental Protection Agency (EPA) personnel and contractor staff were conducting reclamation work at the Gold King Mine located in southwestern Colorado. The excavation of a blocked former mine passage led to the release of an estimated three million gallons of acid rock drainage-influenced water, contaminated with metals and of a low pH. The release flowed into Cement Creek and the Animas River, and then downstream into the San Juan River and on to Lake Powell.

While Federal and state entities have undertaken sampling and data collection efforts in order to understand the effects that the spill may have on human health and the environment, the Navajo Nation has also led efforts to understand the spill effects and protect the people.

Who to Contact

Any additional questions or concerns may be directed to:

Ronnie Ben, NNEPA
ronnieben@navajo-nsn.gov
928-871-7701

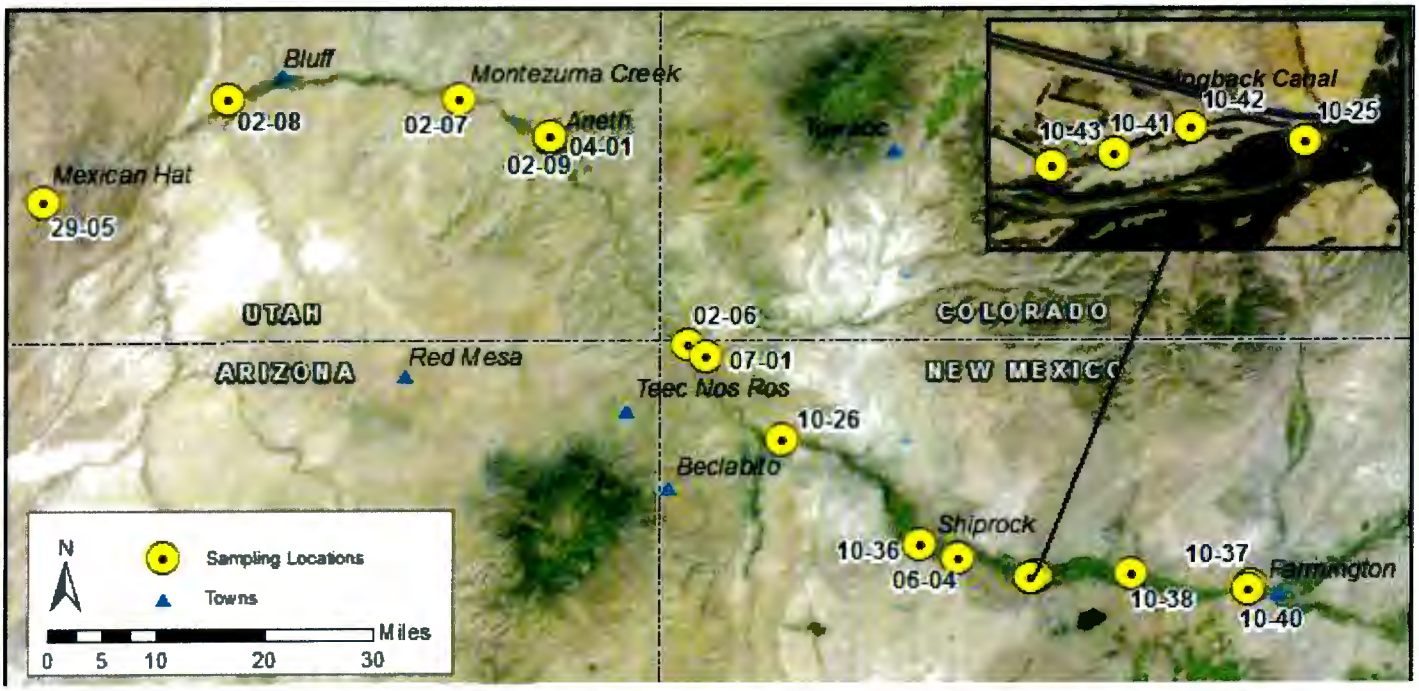
August 8, 2015—Confluence of Animas and San Juan Rivers
Navajo Times photo – Donovan Quintero

Purpose of Sampling and Initial Results

The Navajo Nation's early Spring sampling, which took place from February 29 until March 4, and on March 14, monitored the movement of Gold King Mine-related contamination in the San Juan River over the winter. Laboratory results indicate that concentrations of metals in sediment and water in the San Juan River and in irrigation canals (Fruitland and Hogback) are within acceptable parameters based on NNEPA criteria for key metals and contaminants. Additional sampling as the season continues will evaluate impacts of increased flow from anticipated high levels of snowpack melt and storm events.

Types of Samples

Sampling included **surface water** and **sediment** from the San Juan River, the Upper Fruitland canal, and the mouths of tributaries; and **sediment** from the Hogback irrigation canal. Sites were also identified for future biological monitoring.



Data Interpretation

Data will be interpreted by Navajo Nation personnel, in accordance with relevant criteria developed to protect the Navajo people, livestock, and natural resources. Careful evaluation of the results, as well as results from other concurrent monitoring programs (e.g., NNEPA, U.S. EPA, New Mexico, Utah), will be used to evaluate these safety criteria and to determine future sampling needs. The data table to the right shows the lead levels detected in the sediment samples recently taken. Lead was not detected in the corresponding water samples. The broader set of metals also did not exceed criteria in sediment or water.

Looking Ahead

Additional sampling, targeting storms and the impact of contaminants on animal life, will take place in phases to assist in evaluating long-term impacts.

June 2016—June 2017: sediment/water samples

Post-storm event: sediment/water

Late summer/early Fall 2016: impacts to insects/animals living on river bottom, sediment/water, fish tissue.

Site Descriptions & Sediment Results

Site	Description	Lead
	Sediment effects threshold: 35.8 mg/kg*	*mg/kg*
10-37	SJR at upstream NN boundary in NM near La Plata River	<5
10-40	Fruitland Canal @ first bridge downstream from headgate	5.9
10-38	SJR near Nenahnezad Chapter House	5.5
10-25	SJR @ bottom of Hogback fish passage	4.9
10-41 10-42	Hogback Canal— Headgate to 1st wasteway	8.75
10-43	Hogback Canal—Behind 2nd wasteway	11
06-04	Chaco River near junction with SJR	7.15
10-36	SJR @ Shiprock bridge	<5
10-26	SJR near Area 7	5.6
07-01	Mancos River, junction with SJR	9.95
02-06	SJR - NM/CO border at Four Corners	<5
02-09	SJR upstream from McElmo Ck (Aneth)	5.8
04-01	McElmo Ck, above Hwy 262 bridge	<5
02-07	SJR near bridge at Montezuma Ck	5.85
02-08	SJR at US 191 bridge near Bluff	<5
29-05	San Juan River near Mexican Hat	<5

*The sediment effects threshold is the level below which adverse effects to organisms that live in sediment are not expected to occur (MacDonald et al. 2000).

Where can I find previously collected data?

Data have been collected by various entities, including U.S. EPA, State agencies, and private entities. Many of these data or links to these data can be found at the New Mexico Environment Department's webpage: https://www.env.nm.gov/riverwatersafety/GoldKingData.html