

**NMED**

New  
Mexico  
Environment  
Department



# **GOLD KING MINE SPILL NEW MEXICO LONG-TERM IMPACT TEAM PROGRESS REPORT**

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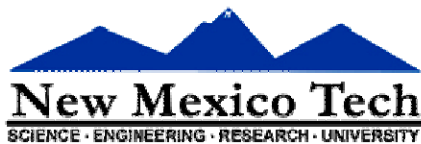
# New Mexico's Team

Multi-jurisdictional agencies appointed by Governor Martinez, along with top science and engineering experts recruited from within the state, are working together to protect water quality and public health in NM.



New Mexico Department of Agriculture

Office of Natural Resources Trustee

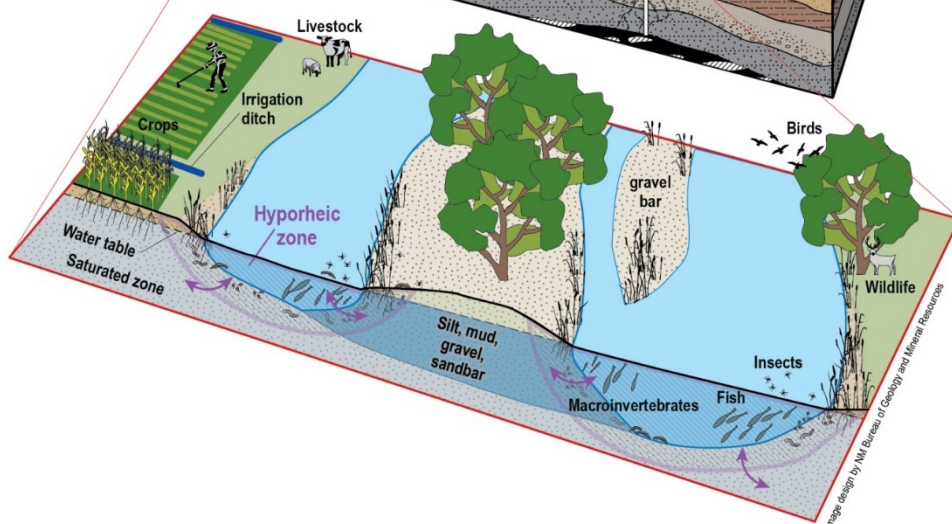
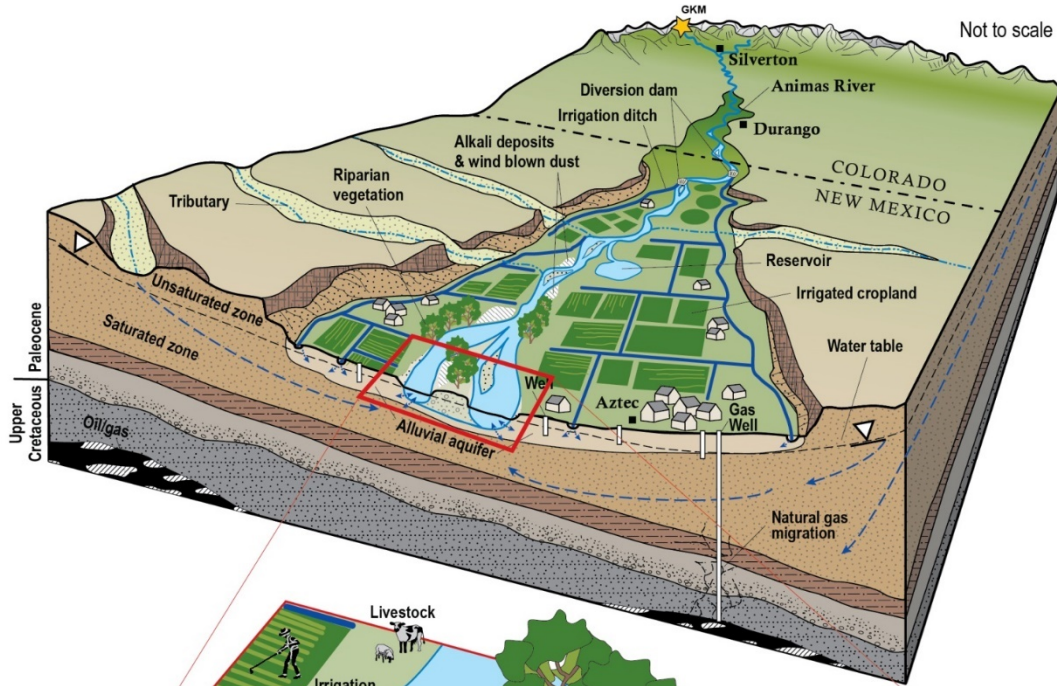


San Juan Soil and Water Conservation District



# Animas River Watershed System

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# 2017 Monitoring

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- **Alluvial aquifer mapping and well sampling**
- **Continued river-water and sediment sampling**
- **Crop tissue survey**
- **Lead-contaminated aquifer sediment**
- **Lake varves (decades of sediment accumulation in reservoirs)**
- **X-ray fluorescence (XRF) survey of metals in sediment**



# Standards and Guidelines

	Lead	Arsenic	Cadmium	Aluminum	Zinc
Drinking Water <sup>1</sup> , mg/L	0.015	0.01	0.005	0.05 to 0.2	5
Groundwater <sup>2</sup> , mg/L	0.05	0.1	0.01	5	10
Livestock Water <sup>3</sup> , mg/L	0.1	0.2	0.05	--	25
Irrigation Water <sup>3</sup> , mg/L	5	0.1	0.01	5	2
Aquatic Life, chronic <sup>3</sup> , mg/L	0.005	0.15	0.00075	3.541	0.228
Residential Soil <sup>4</sup> , mg/Kg	400	35	71	77,000	23,000

<sup>1</sup> US EPA National Drinking Water Standards, <https://www.epa.gov/ground-water-and-drinking-water/table-regulated-drinking-water-contaminants>

<sup>2</sup> NM Water Quality Control Commission, Groundwater Standards, 20.6.2.3103 NMAC, <http://164.64.110.239/nmac/parts/title20/20.006.0002.htm>

<sup>3</sup> NM Water Quality Control Commission, Stream Standards, <http://164.64.110.239/nmac/parts/title20/20.006.0004.htm>

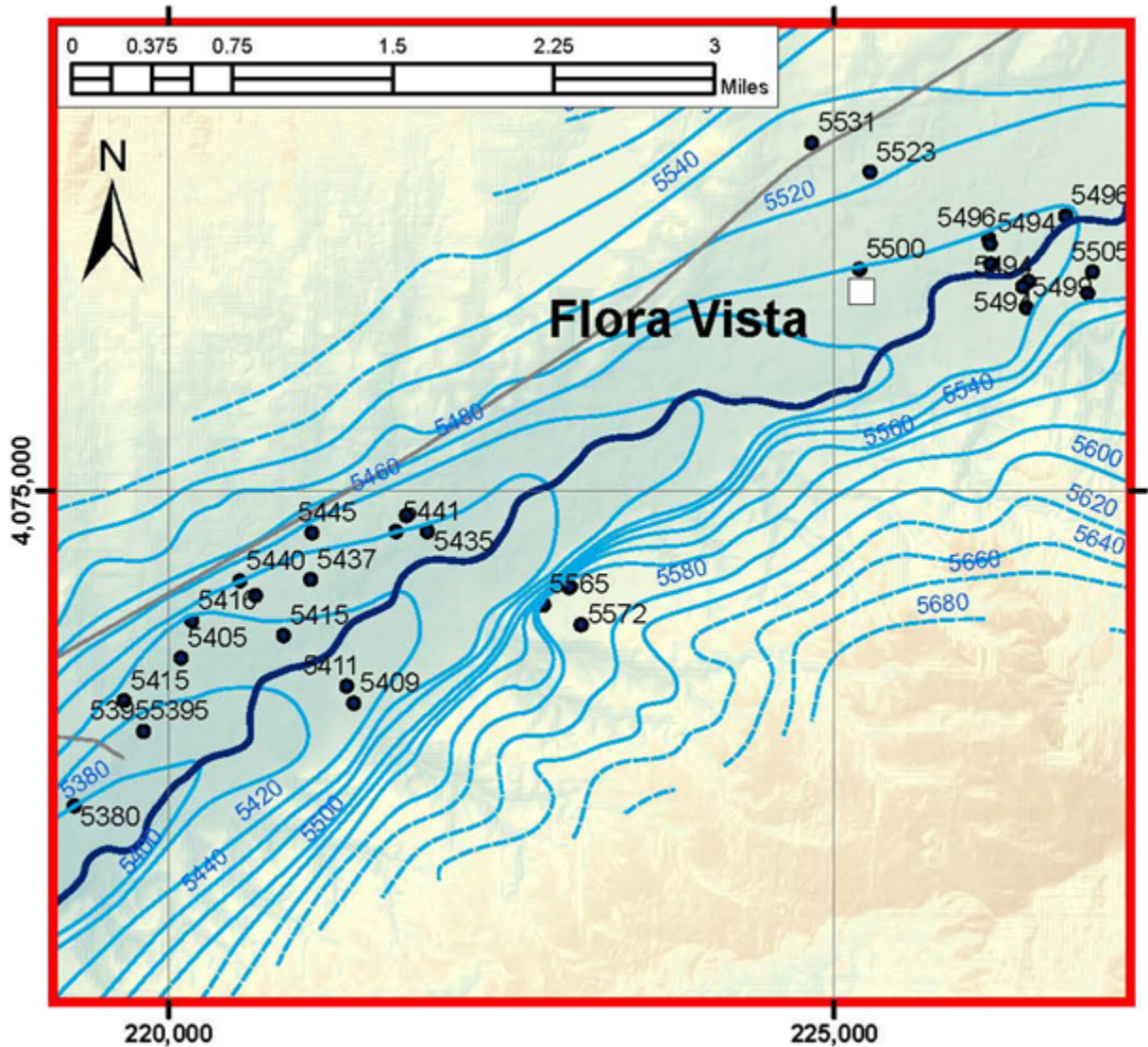
<sup>4</sup> US EPA Risk Based Screening Levels, <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016>



# Aquifer Characterization

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- On a seasonal basis, water levels measured in 80 wells, water quality samples collected in 20 wells
- Animas is a gaining stream regionally, with potentially losing segments locally, particularly in winter when water table is lowest.



# River Sondes

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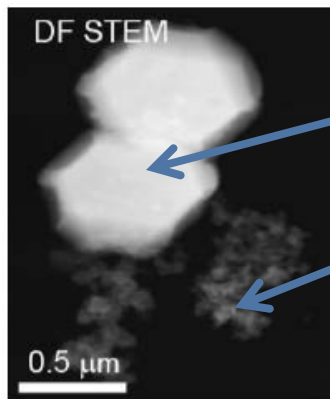
- Sondes installed in the river for flow rate, turbidity, pH, specific conductance, & temperature
- Real-time sonde data published on USGS website  
<http://nm.water.usgs.gov/projects/gold.king.mine/>
- Grab samples at sonde locations for metals and general chemistry



# Solids Analysis

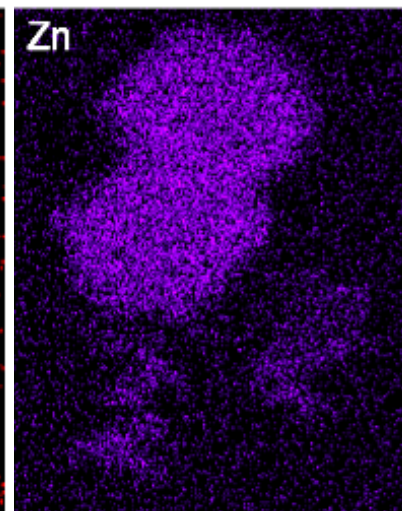
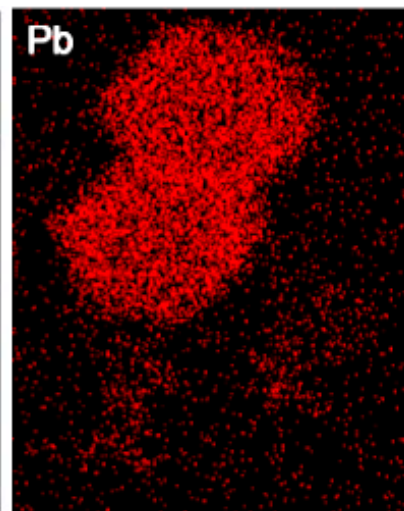
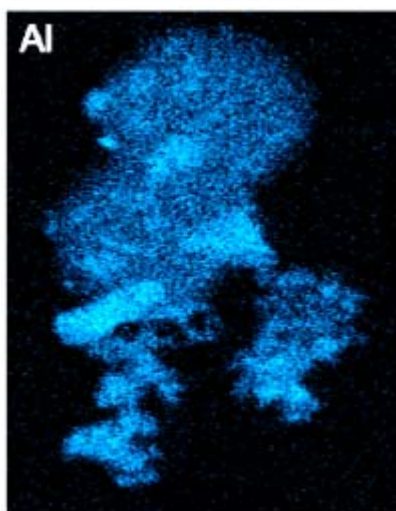
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- Jarosite grains contain aluminum, lead, zinc, and other metals that can be released as jarosite becomes unstable at higher pH.



Jarosite crystals

Clay-rich material



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# X-Ray Fluorescence (XRF) Survey Will be repeated 2017

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- Provides direct reading of heavy metals in sediment
- Ten % samples also collected for NM Department of Health, State Lab, to confirm field tests



# Water-Table Mineralization at Aztec Drinking Water Diversion Channel

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**2,400 mg/kg lead in mineral layer**

**Evidence that surface water contaminants entered groundwater near the river**



# Monitoring Results, So Far

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- ❑ **Heavy metal concentrations in river water are safe for both irrigation and livestock watering**
- ❑ **High flow continues to stir up metals in the Animas River, creating treatment concerns for public water systems**
- ❑ **Alluvial aquifer contained high iron and manganese before GKM spill**
- ❑ **No evidence that GKM spill contaminated water wells**
- ❑ **Mounting evidence that most GKM metals were washed into Lake Powell**
- ❑ **Legacy metals and GKM hotspots, however, are still of concern**
- ❑ **Crop and fish tissue testing shows no high metals**
- ❑ **No unusual livestock or wildlife distress, illness, or mortality observed**





# Animas and San Juan Exposure and Risk Dashboard

(Updated May 19, 2017)

<https://www.env.nm.gov/wp-content/uploads/2016/01/Animas-San-Juan-Risk-Dashboard.pdf>

Potential Exposure Pathway	Risk Level	Explanation
Public Drinking Water Supplies	Safe	Public drinking water supplies are subject to multiple protective requirements of the federal Safe Drinking Water Act (SDWA) and, with one exception, are presently safe for all uses. These requirements include: infrastructure construction standards; solids settling and treatment; disinfection; treated water testing; and New Mexico Environment Department (NMED) inspections. The Harvest Gold water system remains on a boil water advisory for reasons unrelated to the GKM spill. For more information on public drinking water systems, please visit the <a href="#">Drinking Water Watch website</a> .
Private Domestic Wells	Use Caution	Private domestic wells are not subject to the protective requirements of the federal SDWA. Many private wells were not constructed in a sanitary manner or have deteriorated as the well has aged. These wells are at risk of contamination by bacteria, parasites, or viruses. See <a href="#">Fact Sheet on disinfecting a domestic well with shock chlorination</a> . High levels of manganese, iron, sulfate, and total dissolved solids existed in some wells prior to the Gold King Mine (GKM) spill. Elevated lead has been detected in private water systems that have galvanized steel plumbing components or lead solder. Following the GKM spill NMED tested more than 600 private domestic water wells in San Juan County, NM. There is no evidence that the GKM spill contaminated any water wells in New Mexico. NMED and the N.M. Bureau of Geology continue to monitor private domestic wells for evidence of mining and milling contamination.
River Water for Domestic Supply	Unsafe	Untreated river water should never be used for domestic supply, even if there are not visible signs of contamination. When untreated water is consumed from surface sources there is a risk of ingesting harmful bacteria, parasites, or viruses. Untreated river water also may contain high levels of lead and arsenic when spring runoff or storm events stir up contaminated river sediments.
Water Hauling	Use Caution	If you haul water for drinking and cooking, it is recommended that you use commercial bottled water, or obtain water from a public water supply system. Hauling untreated water from a ditch, river, lake, spring or private well is not recommended. See <a href="#">Fact Sheet on safe water hauling practices</a> .

Safe	Use Caution	Unsafe
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# Animas and San Juan Exposure and Risk Dashboard

River Water for Irrigation	Safe	River water presently complies with all standards for irrigated agriculture, and should be safe for irrigation of all crops. See the <a href="#">Fact Sheet on agricultural uses of water</a> .
Crops	Safe	Preliminary testing of crops by New Mexico State University shows safe levels of heavy metals. Crops will continue be tested during the 2017 growing season to monitor safety for consumption by humans and livestock.
River Water for Livestock	Safe	River water presently complies with all standards for livestock watering. See the <a href="#">Fact Sheet on agricultural uses of water</a> .
Livestock	Safe	The New Mexico State Veterinarian, New Mexico Department of Agriculture Veterinary Diagnostic Laboratory, and local veterinarians are on the alert for any signs of unusual animal distress or illness that could result from the GKM spill or other mining and milling contamination.
River and Ditch Sediment	Use Caution	NMED is monitoring sediment contamination in New Mexico to identify any hot spots that exceed residential risk screening levels for lead and other metals. The residents of San Juan County can be the eyes and ears for NMED in the field. Anyone who sees discolored or contaminated soil should notify NMED immediately by calling 1-800-219-6157. If you are comfortable doing so, you may pick up a <a href="#">sampling kit</a> from the NMED Farmington Office located at 3400 Messina Dr. (505) 566-9741 to safely collect a sediment sample that will be tested by NMED.
Fish	Safe	Fish tissue testing by the New Mexico Department of Game and Fish has not identified any heavy metal contamination attributable to the GKM spill. Elevated mercury and DDT were known to exist in fish tissue from some water bodies in San Juan County long before the GKM spill. Mercury is believed to originate largely from the burning of coal. DDT was banned as an insecticide in the United States in 1972, but is persistent in the environment. The "Quality Waters" of the San Juan River below Navajo Lake are located upstream from the confluence with the Animas River and were not affected by the GKM spill or by other mining and milling waste discharges into the Animas River. NMED has issued <a href="#">Fish Consumption Advisories</a> for mercury and PCBs in Lake Farmington, and for mercury in Navajo Reservoir.
Recreational Activities	Use Caution	Mining and milling contaminants do not presently pose hazards to people enjoying water sports, fishing and other recreational activities in and near the Animas and San Juan Rivers in New Mexico. However, both rivers may contain bacteria, parasites, or viruses which could pose a health hazard to people who come into contact with river water. It is recommended that people wash thoroughly after going in the river and avoid swallowing river water when swimming or doing water sports.

Safe	Use Caution	Unsafe
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# Agricultural Fact Sheet

**Additional efforts  
needed to counter  
unjustified stigma  
about crops grown in  
Animas Valley and  
San Juan County.**



## New Mexico Environment Department

PROTECTING OUR ENVIRONMENT, PRESERVING THE ENCHANTMENT

### Animas and San Juan River Water Quality Safe for Agricultural Uses

May 12, 2017

- Animas and San Juan River water quality has met irrigation and livestock-watering standards set by the New Mexico Water Quality Control Commission from 2016 to present.
- Test results from crops irrigated with Animas River water and sampled during August 2015 – October 2016 show no dangerous levels of heavy metals. Crop testing for heavy metals continues for March 2017 – October 2017.
- Since August 2015, no livestock or wildlife have been reported with unusual distress, illness, or mortality that could have been caused by heavy metals.

For additional information and updates, please go to <https://www.env.nm.gov/river-water-safety/> or call 1-800-219-6157.



Photo: New Mexico State University Department of Plant and Environmental Sciences

# Bonita Peak Superfund Site

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- **Support Bonita Peak Mining District Superfund investigation and cleanup, while demanding that EPA:**
  1. **Use sound science;**
  2. **Be honest with the public; and**
  3. **Treat residents downstream from Colorado as stakeholders throughout the Superfund process.**

