



# Gold King Mine Spill Diné Exposure Project

SUMMER 2019  
ISSUE 11

*Funded by:*

**National Institutes of Health**

\$434,028 (3/2016-2/2018)

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\$600,000 (7/2016-7/2019)

U. of Arizona (UA),  
Northern Arizona U.  
(NAU), Navajo Nation,  
Diné College, Tó Bee  
Nihi Dziil, & Fort Lewis  
College



## *TÓŁÍTSO, THE WATER IS YELLOW:*

*Investigating short term exposure and risk perception of Navajo Communities to the Gold King Mine Spill  
– Upper Fruitland; NM, Shiprock, NM; and Aneth, UT –*

**Aim 1:** Determine exposure of Diné residents in these three communities to the Spill.

**August 2016:** Navajo Community Health Representatives sampled drinking water, yard soil, and household dust in about 60 Diné homes to measure for lead and arsenic. They did a finger prick to measure lead in residents' blood using a 3-minute test machine. They collected a urine sample to measure for arsenic. They also asked people what they eat, how they use the river, and how the Spill impacted them.

**To Date:** In December 2017, we reported results back to Shiprock, Upper Fruitland, and Aneth Chapters.

**Aim 2:** Measure lead and arsenic in river water, river sediment, agricultural soil, irrigation water, and irrigation sediment.

**November 2015 – June 2016:** We took almost 1,000 samples of water and sediment from the river and irrigation canals and soil from fields.

**June 2016 – January 2018:** We analyzed the samples for arsenic and lead. Water results were presented at Shiprock Ag days 2017

**To Date:** In March 2018, we reported sediment results back during Shiprock Agricultural Days.

**Aim 3:** Find out what people are concerned about when using the River after the Spill and find out the risk based on the samples and information collected for Aims 1 and 2 (left & middle columns).

**May 13-22 & June 15-17:** We held 12 group discussions or “focus groups:” 4 in Upper Fruitland; 6 in Shiprock; and 2 in Aneth. 123 total people took part in these focus groups. We asked people how they used the river before the Spill; how the Spill impacted them; and what they think about the river's future.

**To Date:** Information specifically related to the emergency response were presented at the Navajo Emergency Response Executive Session in September 2018 and July 2019.

# SHIPROCK TEACH-IN (JUNE 21, 2019)

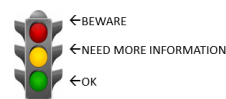
IN ASSOCIATION WITH  
4TH ANIMAS AND SAN JUAN WATERSHEDS CONFERENCE:

Three years in a row, GKMS-DEP cohosted the post-conference teach-in in association with the Animas and San Juan Watersheds conference with the New Mexico Water Resources Research Institute in Shiprock, NM. This year, the meeting was broadly focused on all water quality issues facing the Animas and San Juan Rivers watersheds. Speakers from universities, state and federal agencies, and the private sectors gave flash talks and answered questions, with most information interpreted into Navajo. Around 30 community members attended the teach-in. Council delegate Eugenia Charles-Newton and NM State Representative Anthony Allison also attended to show support to the community.

## GKMS-DEP Key Information

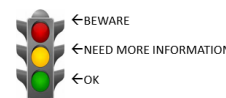
- ❖ “Farming is Life” study results –  
Arsenic and Lead levels in river water, farming water, farming soil and corn all met Navajo Nation guidelines.
- ❖ Risk perception of Navajo communities along the San Juan River following the Gold King Mine Spill –  
  
Although there was no significant environmental impact from the Spill, it is clear that the Spill had long-term emotional and spiritual impacts on the Navajo people.
- ❖ Farmer Survey results –  
According to the survey, majority of farmers rely on their crop production to feed their family; 57% of Navajo farmers who stopped farming due to the GKM Spill have not started farming again.

## Farming is Life Study Results- Lead (Béesh dilyíhí)



	Prior to planting	Growing and Post-harvest	Compared to:
River Water	All 5 samples met guideline	All 40 samples met guideline	NN EPA Maximum Contaminant Level
Farming Water	All 10 samples met guideline	All 40 samples met guideline	NN EPA Maximum Contaminant Level
Farming soil	All 10 samples met guideline	All 10 samples met guideline	Canadian Agricultural Soil Guideline
Corn	All 8 samples similar to NAPI	All 7 samples similar to NAPI	Navajo Agricultural Products Industry 2017 and 2018

## Farming is Life Study Results- Arsenic (Béesh libáhá)



	Prior to planting	Growing and Post-harvest	Compared to:
River Water	All 5 samples met guideline	All 40 samples met guideline	NN EPA Maximum Contaminant Level
Farming Water	All 10 samples met guideline	All 40 samples met guideline	NN EPA Maximum Contaminant Level
Farming soil	All 10 samples met guideline	All 10 samples met guideline	Canadian Agricultural Soil Guideline
Corn	All 8 samples similar to NAPI	All 7 samples similar to NAPI	Navajo Agricultural Products Industry 2017 and 2018

The recording of this teach-in is available on GKMS-DEP facebook page: [www.facebook.com/goldminespillproject](http://www.facebook.com/goldminespillproject).

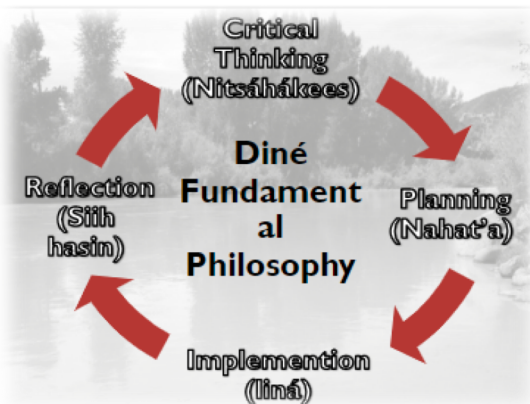
For more information on the 4<sup>th</sup> Annual Animas and San Juan Watersheds Conference, the speakers’ bios and other slides presented at the flash talks, please visit [www.animas.nmwrri.nmsu.edu/2019/](http://www.animas.nmwrri.nmsu.edu/2019/).



## EMERGENCY RESPONSE EXECUTIVE SESSION II: SOCIAL AND CULTURAL IMPACTS OF THE GOLD KING MINE SPILL

Following the 1<sup>st</sup> Executive Session in Flagstaff, AZ in the September of 2018, GKMS-DEP hosted the 2nd Executive Session in Window Rock, AZ on July 17th, 2019. Approximately 40 Navajo Nation leaders attended the session including President Jonathan Nez and Vice President Myron Lizer, Jesse Delmar (Division of Public Safety), and JT Willie (Division of Economic Development). There were also council delegates in attendances, Elmer Begay (Dilcon, Indian Wells, Teesto, Whitecone, Greasewood Springs), Nathaniel Brown (Chilchinbeto, Dennehotso, Kayenta), and Eugene Tso (Chinle). We also had representatives from Diné Centered Research and Evaluation, TBND, DHA, and the NNHRRB.

In this session, we shared updated findings from community focus groups identifying the prominent social and cultural impacts of the Gold King Mine Spill on Diné communities, and discussed critical steps for strengthening culturally-informed emergency response and communication practices on Navajo Nation for the future.



Recommendations from the attendees include:

- ❖ Public access to Navajo Nation EPA data;
- ❖ Navajo Nation All Hazard mitigation plan made available to all with training to chapters;
- ❖ Revitalization of the land
- ❖ Building traditional ecological knowledge database regarding the San Juan River's history
- ❖ All this information needs to be available in Navajo

Main topics of conversation include: 1) environmental results matched traditional leaders' saying that the river has healed itself; 2) it is important to have considered all the impacts from a holistic standpoint; 3) how to help community heal and prepare for the future.

The recording of this meeting is available on GKMS-DEP facebook page:

[www.facebook.com/goldminespillproject](https://www.facebook.com/goldminespillproject).



## Videos - End of Project Reflection

End of project reflection videos are now available on our YouTube channel “Navajo Gold King Mine Spill Exposure Project”. The video interviewed Navajo leaders to share their thoughts on the Gold King Mine Diné Exposure Project in the past year.




**Gold King Mine Diné Exposure Study - End of Project Reflection (long ver.)**


Gold King Mine Spill Diné Exposure Project • 38 views • 3 weeks ago

Navajo leaders share their thoughts on the Gold King Mine Diné Exposure Project. GKM-DEP investigated the short term exposure and risk perception of Navajo Communities to the Gold King Mine


We also have videos presenting the key findings, narrated in Navajo with English subtitles playlist featuring Navajo perspectives on the Gold King Mine Spill, and archives for past radio forums.

- 1  **Footage from Gold King Mine Spill**  
House Committee on Natural Resources GOP

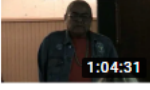
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- 2  **Chili Yazzie speaks about Gold King Mine spill, effects for Navajo 9-17-2015**  
The Red Nation

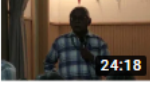
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- 3  **Navajo Perspectives on the Gold King Mine Spill (3/29/16)**  
Gold King Mine Spill Diné Exposure Project

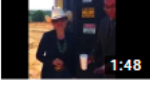
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- 4  **Dine Perspective -- Sharing Stories Across the Watershed, Part 1 (4/17/18)**  
Gold King Mine Spill Diné Exposure Project


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- 5  **Dine Perspective -- Sharing Stories Across the Watershed, Part 2 (4/17/18)**  
Gold King Mine Spill Diné Exposure Project

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- 6  **Navajo Nation president Responds to Tainted Water Tanks being delivered by the EPA**  
Zefren Anderson

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- 7  **UA-NAU Gold King Mine Spill Project San Juan River Sampling**  
Karletta Chief

Check out all the playlists on our YouTube channel!

We gratefully acknowledge our many research partners, volunteer students, advisory board members, and funding sources. This research effort is enhanced immensely by their enthusiastic support.

**NIH** National Institute of Environmental Health Sciences  
IR2IES026948-01

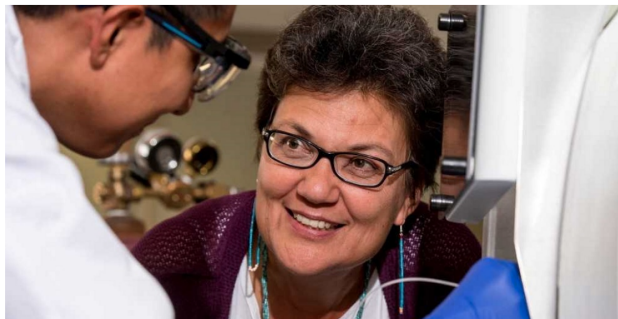
**A** Agnese Nelms Haury Program in Environment and Social Justice  
5P50ES026089-02

**CAIR** Center for American Indian Resilience  
IP20MD006872

**S** Superfund Research Program  
The University of Arizona

**S** Southwest Environmental Health Sciences Center  
P30ES006694

Dr. Jani Ingram is the 2019 College of Science Alumna of the Year



Congratulations to CBC alumna Jani Ingram, who has been selected as the 2019 College of Science Alumna of the Year. Dr. Ingram earned her Ph.D. in Chemistry in 1990 under the mentorship of Dr. Jeanne Pemberton. Currently she is a Professor of Analytical and Environmental Chemistry at Northern Arizona University in Flagstaff.

WHAT'S NEXT?

- 2019 SACNAS - The National Diversity in STEM Conference
- Publications

Fact Sheet

Chief, K., J.F. Artiola, P. Beamer, S. Wilkinson, R.M Maier, C. Rock, and C. Sanchez. 2015. Understanding the Gold King Mine Spill. Fact Sheet. University of Arizona, Tucson, AZ. ([http://www.superfund.pharmacy.arizona.edu/sites/default/files/u43/gold\\_king\\_mine\\_spill.pdf](http://www.superfund.pharmacy.arizona.edu/sites/default/files/u43/gold_king_mine_spill.pdf))

News Article

Beamer, P., K. Chief, N. Borrero, and B. Rivera. 2016. Water Is Our Life: How a Mining Disaster Affected the Navajo Nation. Truth Out, April 2016, <http://www.truth-out.org/news/item/36049-water-is-our-life-how-a-mining-disaster-affected-the-navajo-nation>.



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