

# Disruption of Life Cycles in Blue Gap-Tachee Community, Navajo Nation

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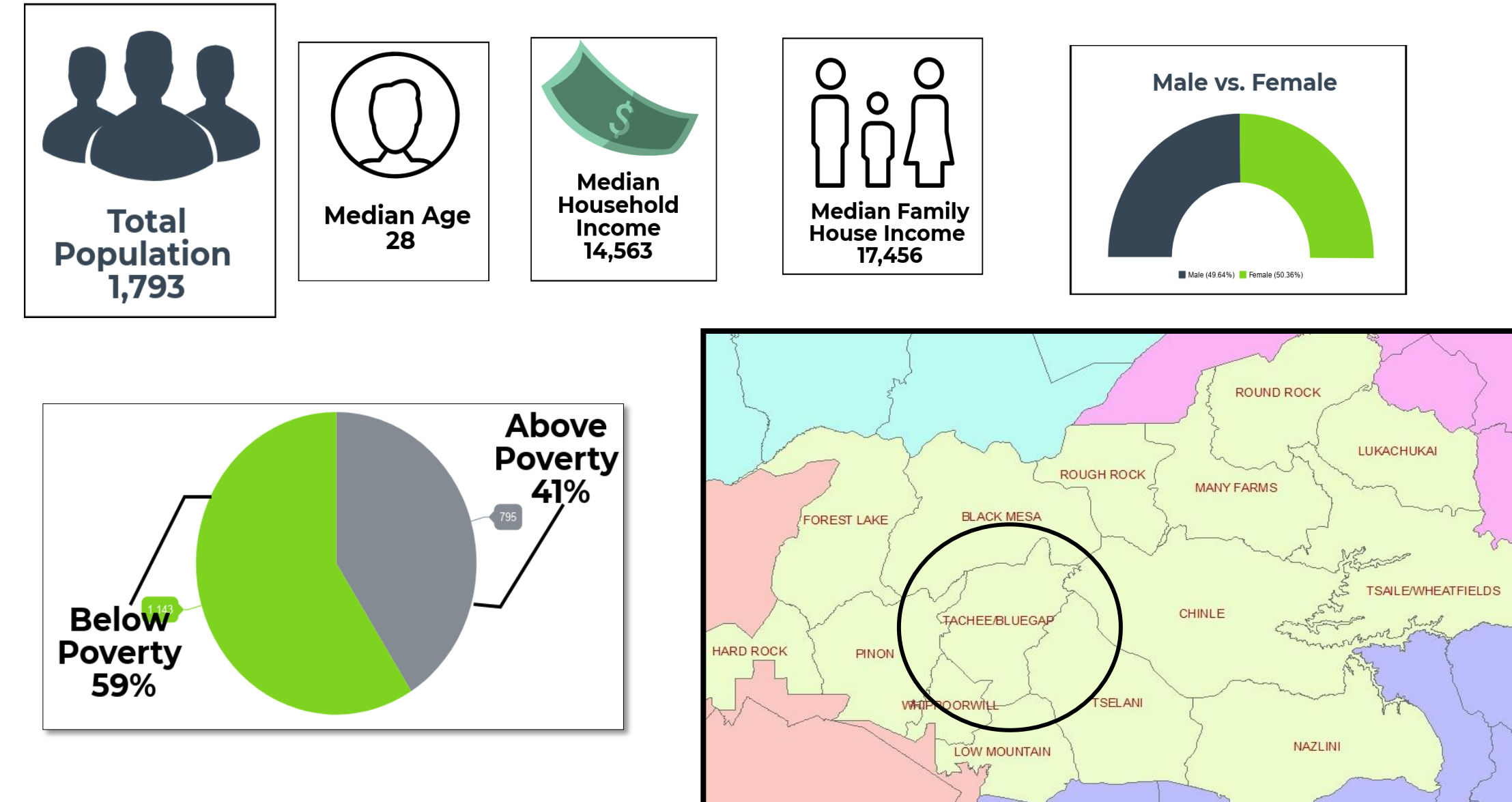
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## Overview of our Community

The Blue Gap/Tachee Chapter was established as a local government by Navajo Nation in 1960. In 1957, a trailer school was built in Tachee near Claim 28 (1.5 miles). A church and a Senior Center were built later at the current chapter location. The Blue Gap/Tachee Chapter is home to 20 abandoned uranium mines (AUMs), which operated from the early 1950s to the late 1950s. Many local people worked in the mines during that time. Claim 28 is the largest and is considered most dangerous because it is located within a 1-mile radius of many homes. Other existing AUMs are on the mesas near Waterfall Canyon (see map below), which is located northeast of Claim 28. The Etsitty family resides in Waterfall Canyon where they raise sheep and depend on a contaminated spring for livestock water. Since the uranium mines were abandoned, the livelihood of the community has remained unchanged.

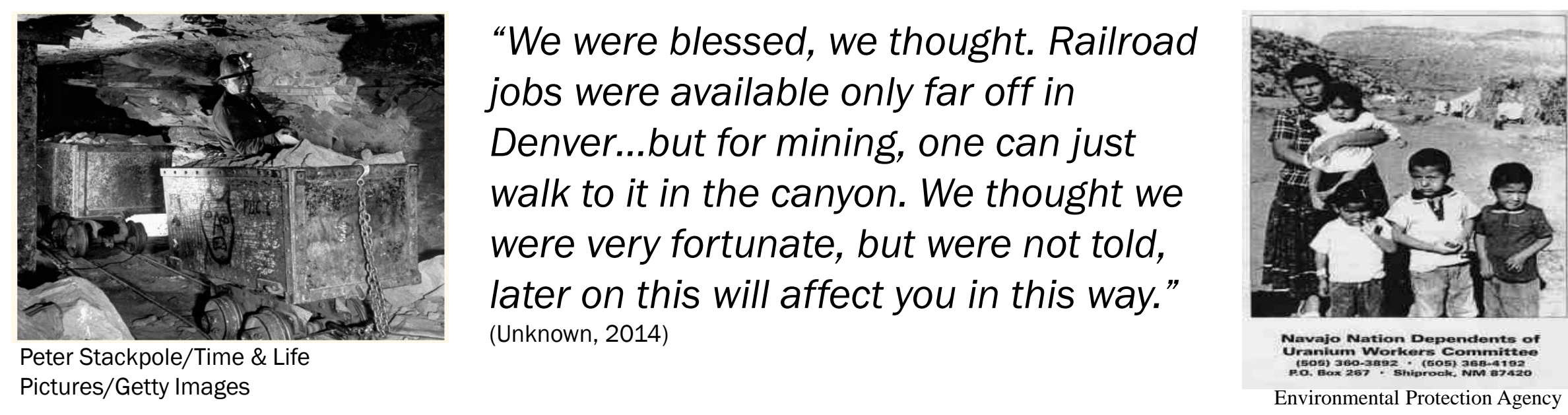


## 2010 Census Demographics



## Mining History

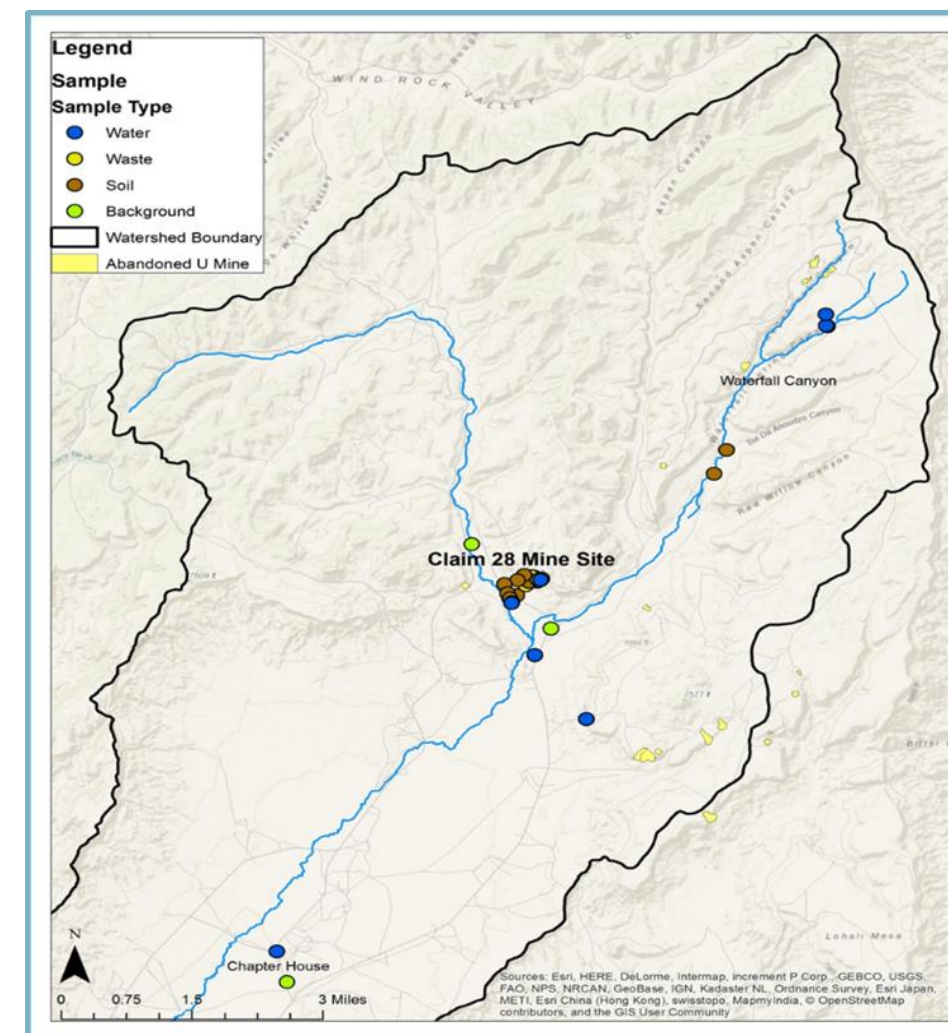
In the 1950s, the mines signified income stability for many of the Navajos living near the area, but for a short period. The workers and community knew very little about the health concerns the mines would cause later in their life.



## Uranium Extraction & Company

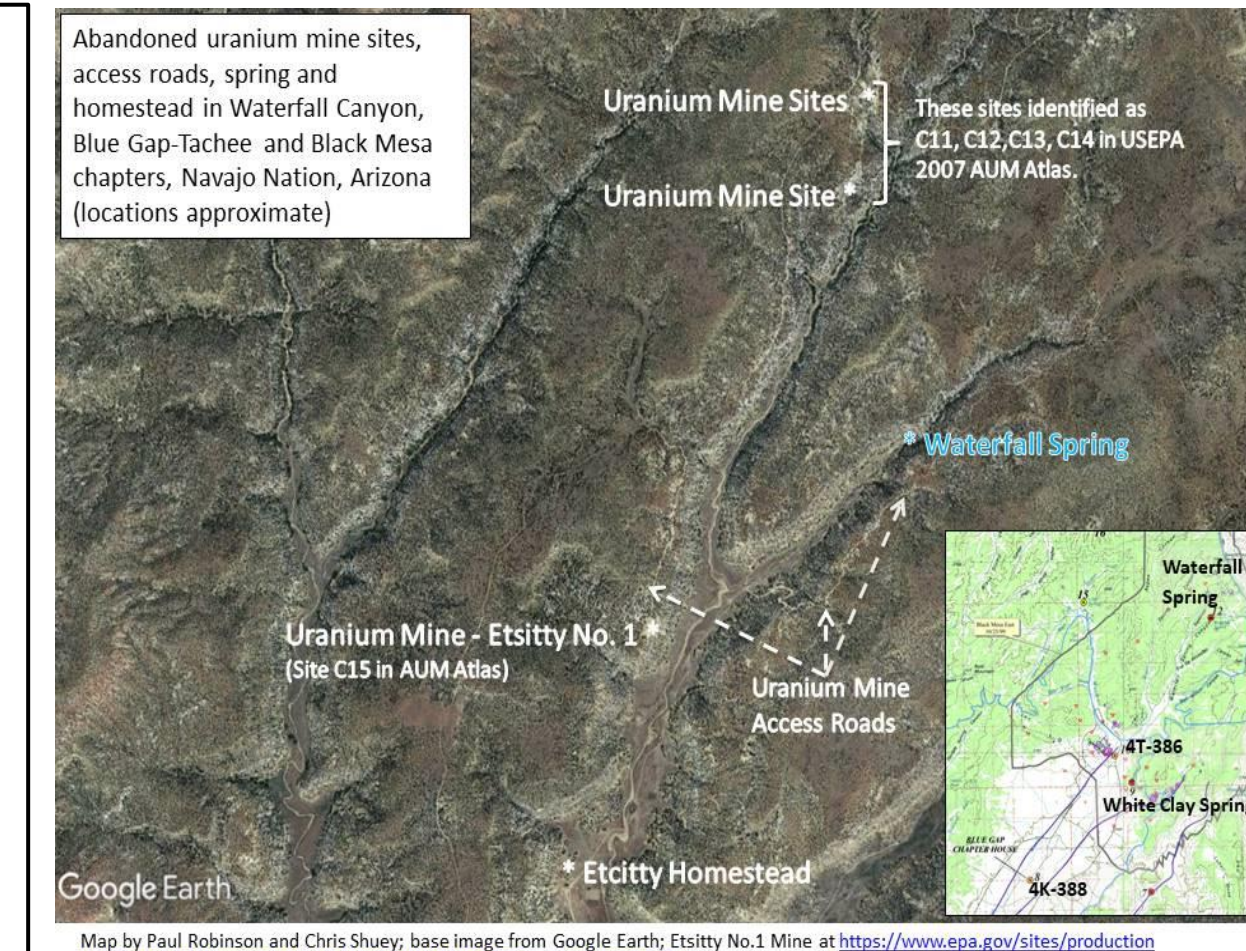
Year	Company	Production (lbs)	Reserves (lbs)
1950	Uranium Resources, Inc.	100,000	1,000,000
1951	Uranium Resources, Inc.	150,000	1,500,000
1952	Uranium Resources, Inc.	200,000	2,000,000
1953	Uranium Resources, Inc.	250,000	2,500,000
1954	Uranium Resources, Inc.	300,000	3,000,000
1955	Uranium Resources, Inc.	350,000	3,500,000
1956	Uranium Resources, Inc.	400,000	4,000,000
1957	Uranium Resources, Inc.	450,000	4,500,000
1958	Uranium Resources, Inc.	500,000	5,000,000
1959	Uranium Resources, Inc.	550,000	5,500,000
1960	Uranium Resources, Inc.	600,000	6,000,000

## Abstract



Map by Joe Hoover, PhD, UNM

The community of Blue Gap/Tachee examines the exposure to abandoned uranium mines tracing back to the beginning in the late 1950s. Before the disruption of lifecycles, the community valued the natural state of plants, forage, land, the health and welfare of the community where everything was considered to be a beautiful state. Residents living near the area recollect painful memories of family members suffering from the effects of the uranium mines. Families resided in the area for many generations until they started having health problems leading to death of family members. Residence shared stories of their family members who worked at one of the mines near their home. They drank from hand-built dikes used to store water for livestock. The water ran off the mines into the shallow ponds. It wasn't until 1988 when the first chapter resolution was issued, because Tachee residents were experiencing health problems and deaths at an unusual rate. As of today, the effects of uranium contamination are affecting generations. Elders in the community also noted the changes in the state of the land. Members are now urging NNEPA and federal government to begin remediation. The disruption of lifecycles in plants, traditional herbs and vegetation are being witnessed by the elders. The plants native to the area no longer present in the area from the impact of uranium, and community clean-up.



Abandoned uranium mine sites, access roads, spring and homestead in Waterfall Canyon, Blue Gap Tachee and Black Mesa Chapters, Navajo Nation, Arizona (locations approximate)

## Disruption of Life Cycles – Community Experiences



Helen Nez

Helen Nez has lived her whole life in the Blue Gap Chapter on the center of the Navajo Nation near Tachee, Arizona. She had 11 children. One of her children was stillborn. She lost six additional children to Navajo neuropathy, a disability that was not recognized at the time. Three of her children died before their third birthdays. Their stomachs became bloated and their eyes became a cloudy gray color as they became sick. Through all her ordeals with each child, their help and support came from the local Catholic Church, Navajo and Hopi Medicine men, and social workers. There was no history of such sickness in either her family or her husband Leonard's until uranium mining came to Blue Gap in the 1950s. Helen said, "Leonard worked at one of the mines near their home...the family hauled it (water) for drinking, making coffee, washing dishes and clothes, and for bathing." (K. Helms, Gallup Independent, 2009)



Claim 28 is above the Greyeyes's residence (photo by Jose Cerrato)

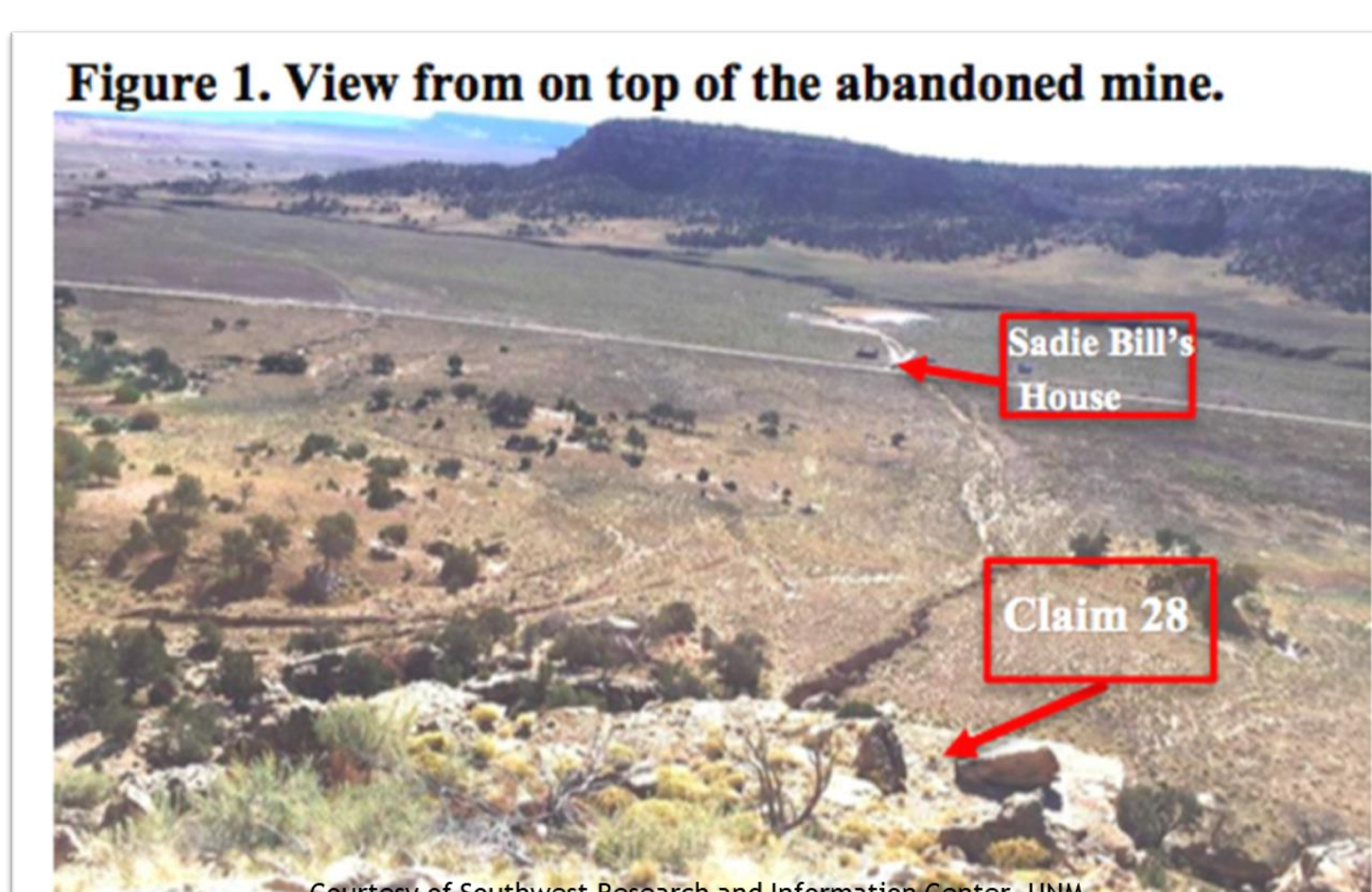


Figure 1. View from on top of the abandoned mine.



Sadie Bill stands behind her pickup truck near Claim 28



Community members noticed the changes in the vegetation of plants on the land. The pictures depict drastic changes over 60+ years. (image courtesy of USEPA)

## Ongoing Research Conducted and Selected Results

### Research Conducted by

- Navajo Birth Cohort Study (NBCS) is a prospective study of pregnancy and neonatal outcomes in relationship to exposure to uranium waste.
- Navajo Nation Environmental Protection Agency (NNEPA) investigates and assesses abandoned uranium mines.
- Southwest Research and Information Center (SRIC) works with the community to document the impacts of AUMs.
- University of New Mexico (UNM) College of Pharmacy works with communities to study the connection between environmental exposures and disease.
- UNM Metals Exposure and Toxicity Assessment on tribal Lands in the Southwest (METALS) is dedicated to studying the toxic effects of mixed metals and uranium exposure on tribal communities in the Southwest.
- U.S. Environmental Protection Agency (USEPA) is funding and overseeing assessments and remediation of abandoned mines on the Navajo Nation.

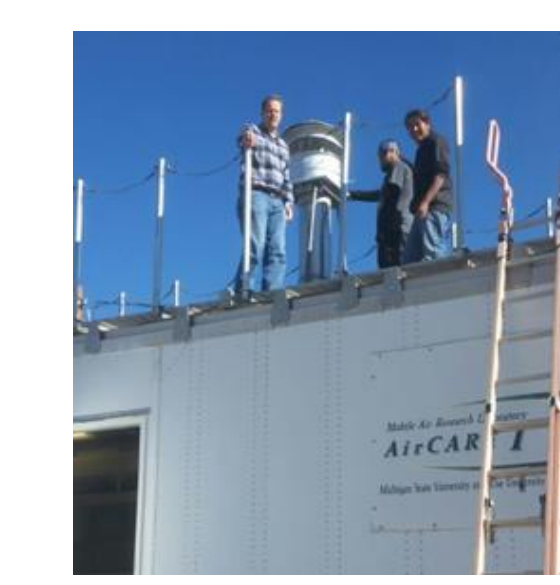
Site	Superfund Activities	Period of Operation and Area	Waste Volumes	Hazardous Substances	Affected Populations
Tachee Uranium Concerns Committee (TUCC) & Blue Gap-Tachee Chapter (BG-TC)	Claim 28 Mine & 12 Other AUMs; CERCLIS #N0000909179	1954-68 *80 acres at Claim;	4,995 cubic yards @ Claim 28; 17,000 tons U ore all mines	U,V,As,Fe	17 families (~70 people) w/in 1 mile of Claim 28 Mine

### Results: Summary of Water Quality Data in Blue Gap-Tachee Water Sources, and Use Recommendations

Well or water source	Distance to nearest AUM	Contaminants >MCL	Contaminants >SDWS	Test period	2018 Status (Use)	Use Recommendations
NTUA System (N0403004)	>15 miles	None (As = 7 ppb in 2018)	None published	2011-2016	Operating (PWS)	Human Domestic Livestock
4K-388 (Chapter Windmill)	~6 miles	Arsenic: >MCL	Aluminum, iron, TDS	2015	Operating (UNR/LS)	Human Domestic Livestock
4E-386 (Old School Windmill)	~1.5 miles	Radium: >MCL	Aluminum, iron, manganese, TDS	1998, 2015	Inoperative (UNR/LS)	Human Domestic Livestock
Claim 28 Mine seep	0 miles	Gross alpha, total radium, uranium, fluoride, nitrate	Aluminum, iron, manganese, pH, TDS	2014-2015	Inoperative (no uses)	Do NOT go on to this site! High radon levels, unsafe footing. Avoid use for livestock if another, safer water source is available.
Waterfall Spring	~1 mile	Gross alpha, total radium, uranium, fluoride, nitrate	Aluminum, iron, sulfate, TDS	1998, 2013-2015	Operating (UNR/LS)	Human Domestic Livestock
White Clay Spring	~1 mile	Gross alpha, uranium, radium: >MCL	Aluminum, iron, sulfate, TDS	1998, 2014-15	Operating (UNR/LS)	Human Domestic Livestock
Private Stock Pond	~0.5 miles	Lead, gross alpha, uranium: >MCL	Aluminum, iron, sulfate	2014, 2015	Operating (UNR/LS)	Human Domestic Livestock
Polacca Wash near Chapter House	~6.5 miles	None	Not enough data	2015	Intermittent runoff	Human Domestic Livestock
Private Well	~8 miles	Arsenic, lead: >MCL	Aluminum, iron, pH, sulfate, TDS	2015	Operating (UNR/LS)	Human Domestic Livestock



Community member Tiva Shirley operates a particulate matter (PM) collector in 2015 as part of a study of metals in dusts released from abandoned mine sites.



At-Care's mobile lab operated by UNM, is studying the effects of mine dust on laboratory animals. Tests showed dust released from Claim 28 has tiny particles that can be breathed deeply into peoples' lungs. These particles contain uranium, vanadium and other harmful metals.



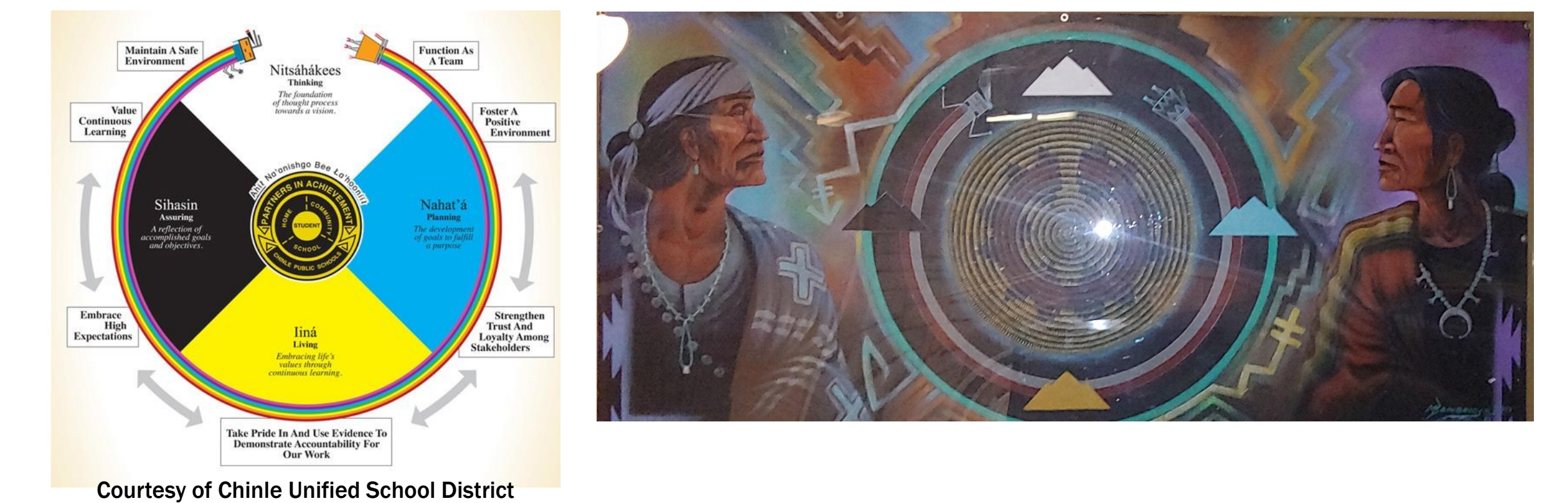
UNM Lab Tech Beth Sanchez and BG/TC resident Floyd Bolwin install a meteorological station on top of Claim 28 in 2017.

## Traditional & Cultural Aspects of the Community

Elders in the community still uphold their cultural teachings. They still collect medicinal herbs from natural plants that grow in the area. Community members maintain that special connection to the land by prayers, songs, and traditions. Although there was a disruption in their cultural practices, community members continue to live by their traditional beliefs. A community member stated, "they still collect the different types of dirt used for traditional sandpainting." The Navajo principle Sa'ah Naagháí Bik'eh Hózh (SNBH) in Navajo philosophy connects the Navajo people to their ancestral homeland.



The paintings above and below, which depict traditional cultural practices, hang on the walls of the Blue Gap-Tachee Chapter House.



Courtesy of Chinle Unified School District

## Community Recommendations

- NNEPA needs to take full control and accept the present/available reliable studies and interact with outside agencies to remediate abandoned mines. NNEPA and USEPA, in collaboration with Navajo Nation Government, must demand that Congress prioritize remediation of abandon uranium mines on the Navajo Nation. Demand an immediate action by our state's members of Congress to sponsor a legislation to amend the current Superfund Regulation to include all abandon mines whether they were considered least threat to human or nature. NNEPA should welcome and use all data, studies, analysis and investigations to accelerate remediation.
- NN Government must direct NNEPA to isolate and fence exposed areas. Navajo Nation is definitely aware of all abandoned uranium mines throughout the Reservation and the Nation Government is very adamant on the danger of these abandoned mines. These sites have wastes and soils contaminated with harmful heavy metals. The Nation has the responsibility to protect the people and its environment.
- Seek professional advice from scientists who have done extensive research on uranium, arsenic, and other highly toxic contaminants in the environment, to properly dispose or remediate legacy wastes based on their exposure levels. Navajo Nation needs highly accomplished Navajo scientists and modern laboratory equipment and facilities to conduct its own analytical studies to recommend clean-up methods. The Nation must be willing to accept studies from outside scientists to assist in remediation.
- Establish cooperation/collaboration with State and Federal agencies and other Tribes in to initiate data collection and develop an agreement to share valuable data. Navajo Nation must establish communication with outside agencies to begin gathering vital data relating to all uranium issues and effects on human health and the environment. NNEPA can establish a data center to seek, receive and build a research facility.
- Lobby for increased funding for the Navajo Birth Cohort Study and for local statistical data base regarding Navajo Neuropathy. The NBCS-ECHO will promote healthy family living and lower the risk of developmental disabilities (mental and physical). This program is very essential to the Navajo Nation.

## Acknowledgements

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