

# LIVING NEAR THE WHITE MESA MILL



# QUESTIONS *and* ANSWERS



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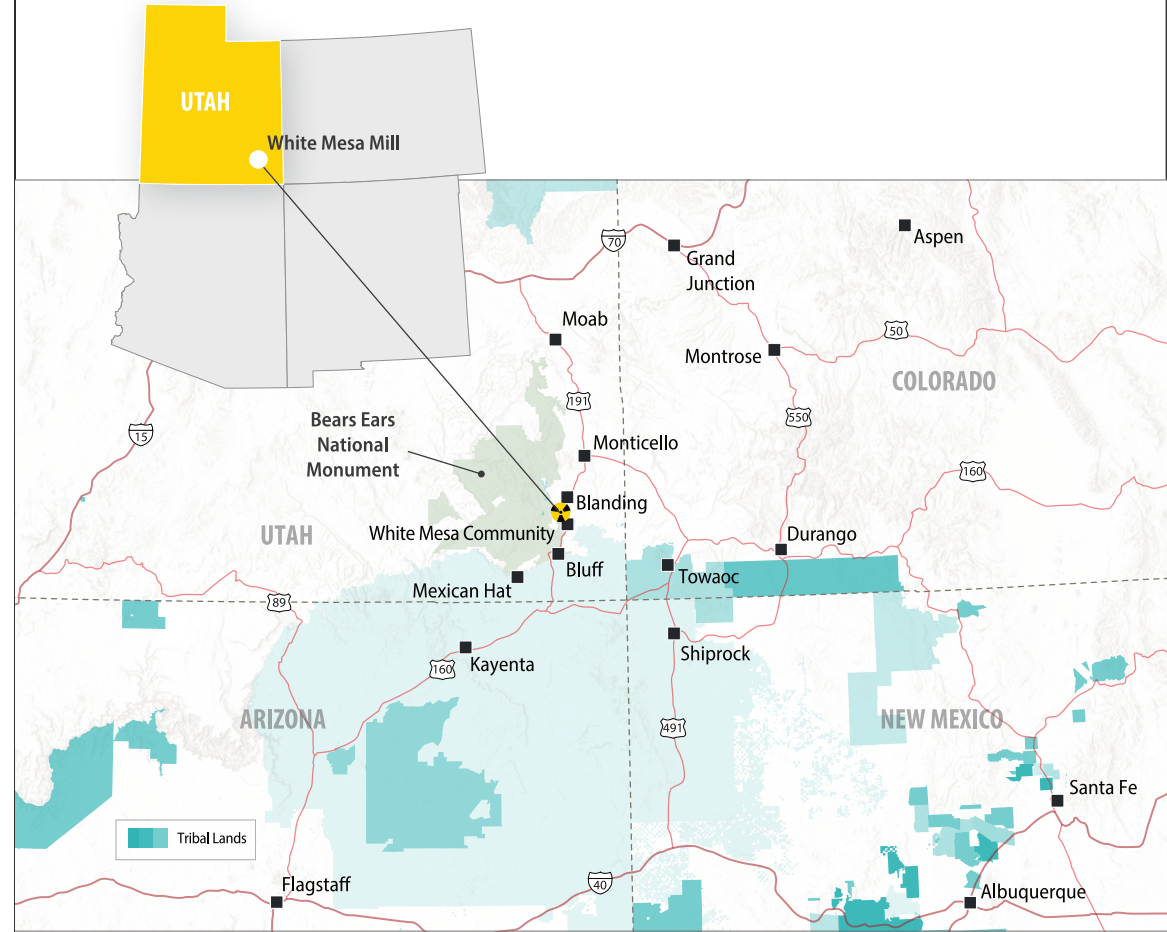
# THE WHITE MESA COMMUNITY

## Where is White Mesa?

Our community of White Mesa is on the Ute Mountain Ute Reservation, off of U.S. Highway 191 just north of Bluff and south of Blanding, in San Juan County, Utah. White Mesa is a large, flat-topped hill with steep sides surrounded by deep canyons. There are many seeps and springs in the area.



ALL PHOTOS ON THIS PAGE BY BLAKE MCCORD



MAP BY STEPHANIE SMITH

## Who lives in White Mesa?

White Mesa is a rural community. About 300 people live here, mostly Ute Mountain Ute tribal members. Many people keep dogs, horses, and other animals. We also harvest plants for cultural use, including willows to weave traditional baskets, and hunt animals, like deer and rabbits, for food. There is no school or supermarket in our community, so many of our people drive long distances to work, or to buy supplies for their families. Children ride the bus along Highway 191 to school, and our people walk along this highway to visit friends and relatives, or to travel to the community center, or the travel center gas station, the only place in our community to buy bottled water. Trucks carrying radioactive materials bound for the White Mesa uranium mill travel along Highway 191 and have spilled radioactive materials.

The White Mesa Mill is located about three miles north of our White Mesa Reservation. The mill began operating in 1980.



## URANIUM AND YOUR HEALTH

### What is uranium?

Uranium is a metal that exists naturally in the earth. Uranium is very common. There are small amounts of uranium in almost all the soil, rock, and water in the world.<sup>1</sup>

Uranium ore is naturally found in some rocks. It is often yellowish in color.

### Uranium can be mined in two different ways:

- 1 Miners can dig up rocks on the surface or underground that contain uranium.
- 2 Miners can use strong chemicals to dissolve uranium from underground rocks into groundwater, and then pump the water to the surface.<sup>2</sup>

Uranium is used by nuclear power plants to make electricity. It was also used to make the first atomic bomb and is still used to make nuclear weapons. Over time, uranium breaks down and decays. As it decays, it changes forms. Some of its decay products are used in the medical field to treat cancer.

Uranium is radioactive. If we inhale or eat it, it can get into our bodies. Uranium and its decay products mostly pass through the body, but our bodies will actively absorb some decay products like radium, and they remain in our bodies.

### What does “radioactive” mean?

When something is “radioactive,” it releases radiation — energy and tiny particles that you cannot see. Large amounts of radiation can hurt people, animals, and plants.<sup>3</sup>

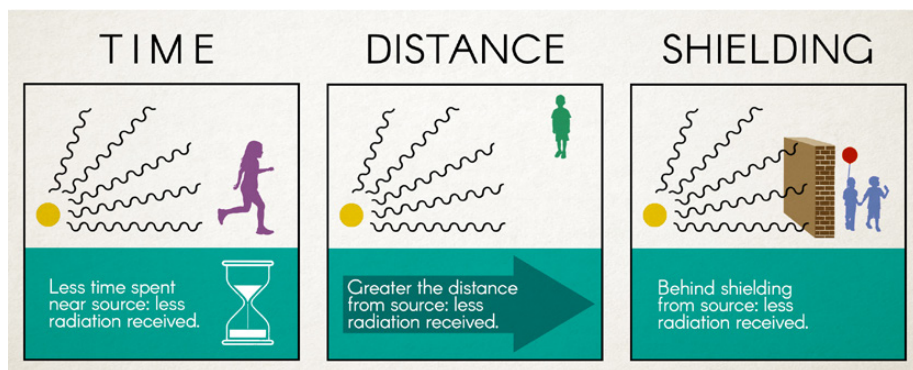
We are all exposed to radiation in our normal lives. There is some radiation in our food and in other things we come in contact with daily.



Sitting in the sun, eating one banana, or getting an x-ray at the dentist’s office all expose you to a small dose of radiation.<sup>4</sup> For example, bananas contain a radioactive form of potassium and there’s no reason to be afraid of bananas. But being close to strong radiation over time can hurt you.

There are different types of radiation (alpha, beta, and gamma) and different ways to protect yourself from them.

### How to protect yourself from radiation



Radiation Monitoring Project

### What is radioactive decay?

As uranium emits radiation and energy, uranium changes and becomes less radioactive. The process of uranium becoming less radioactive and more stable is called radioactive decay.

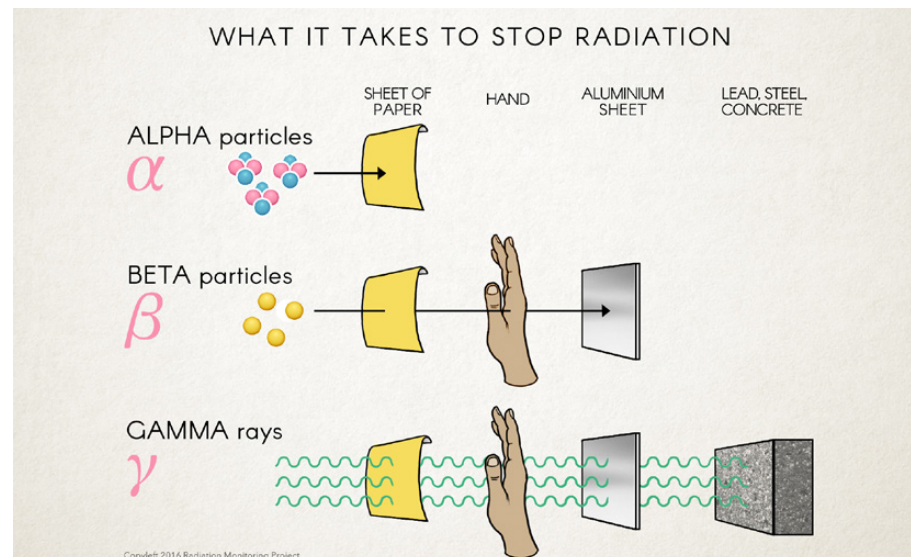
As uranium decays, it becomes other elements, including radium and polonium. Eventually, it becomes lead. This can be a very long process. If you have one pound of uranium, it could take several billion years for half a pound of it to become lead.

### What are the health effects of uranium and radiation?

Uranium emits radiation, which can cause health problems.

Everyone comes in contact with low concentrations of uranium because it's in the environment. But coming in contact with higher concentrations of uranium can be harmful to your health.

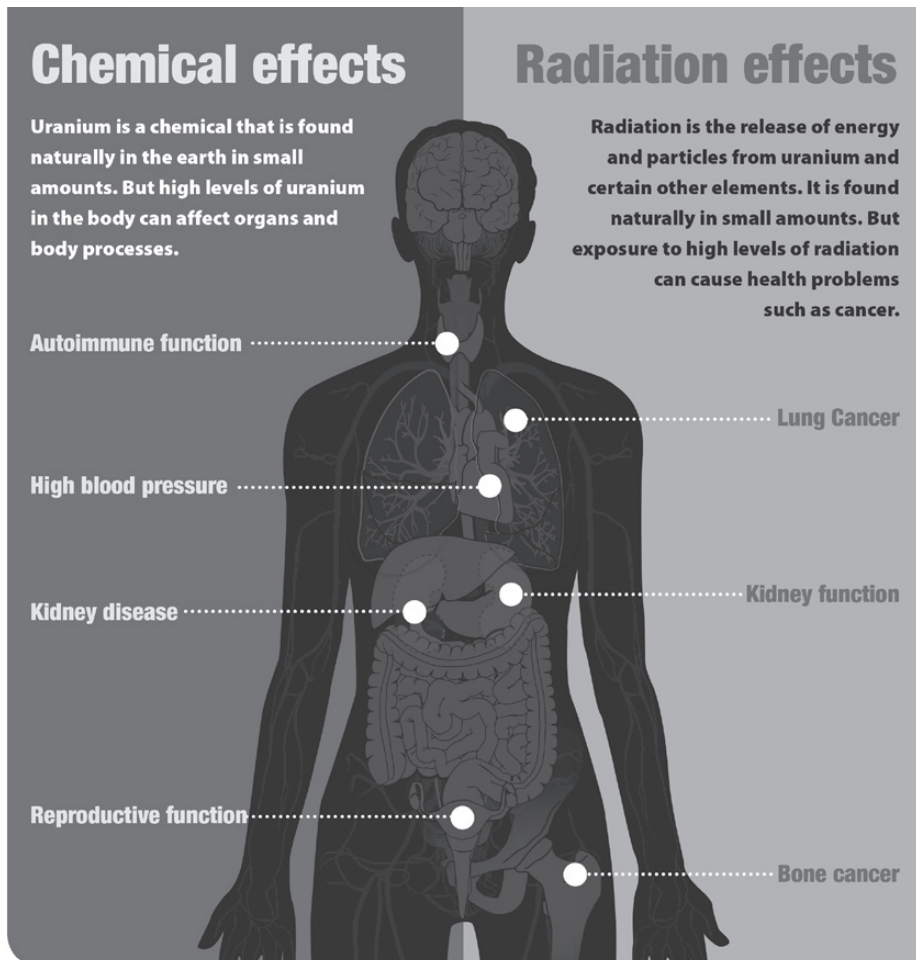
Inhaling or ingesting uranium into your body is linked to kidney damage, and exposure to radiation may increase your risk of getting cancer.<sup>5</sup>



Radiation Monitoring Project

Uranium, if enough is ingested, can have serious effects. Uranium is a heavy metal that can poison the body, and target your bones, liver, and kidneys.

## Uranium and Your Health



U.S. Environmental Protection Agency

## Communities affected by uranium

Communities near uranium mines and mills often experience health problems.

On the Navajo Nation, Navajo people who worked in uranium mines, or whose families lived near uranium mines or mills, sometimes built their homes out of dirt and rocks that had uranium in them. Children sometimes played in dirt or water that had uranium in it, and people drank water contaminated with uranium.

The Navajo Birth Cohort Study surveys Navajo families to see how their health is affected by uranium. This study found that 27% of the participants have high levels of uranium in their urine, compared to 5% of the U.S. population.

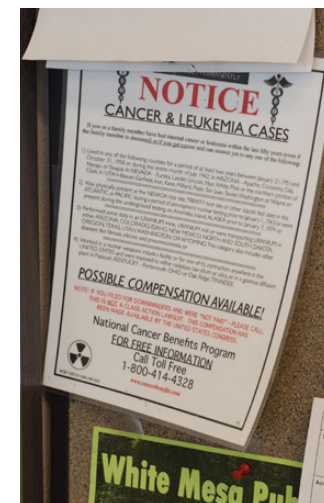
In White Mesa, volunteers gave urine samples to test for uranium levels. Although high uranium levels were not found, we can repeat this study to continue to check on the health of our White Mesa Community.

Many Navajo people have died of kidney failure and cancer, conditions linked to uranium contamination. And research from the Centers for Disease Control shows uranium in babies in Navajo communities when they are born.

This type of study is important to understand our health. This is why the Ute Mountain Ute Tribe is doing its own Health/Home Study. The Tribe's goal is to find funding and start a long-term epidemiological study to study the health of people in the White Mesa Community over many years.



TIM PETERSON



BLAKE MCCORD



The White Mesa uranium mill and its waste ponds. BRUCE GORDON, ECOFLIGHT

## WHAT IS THE WHITE MESA MILL?

The White Mesa Mill is the only operating commercial uranium mill in the United States. It's the only place in the United States to send rocks containing uranium ore that miners dig up from underground uranium mines to be made into yellow cake (concentrated uranium powder) for use in nuclear energy.

### Where is it?

The White Mesa Mill occupies more than 5,400 acres on White Mesa, about three miles north of the Ute Mountain Ute Tribe's White Mesa Reservation, six miles south of Blanding, Utah, and one mile east of Bears Ears National Monument.

There are many cultural sites on White Mesa. Pit houses, kivas, and burial sites were dug up, disturbed, and destroyed when the mill and its waste pits were built. Plans to expand the mill and dig more waste pits would likely disturb more cultural sites and burials.

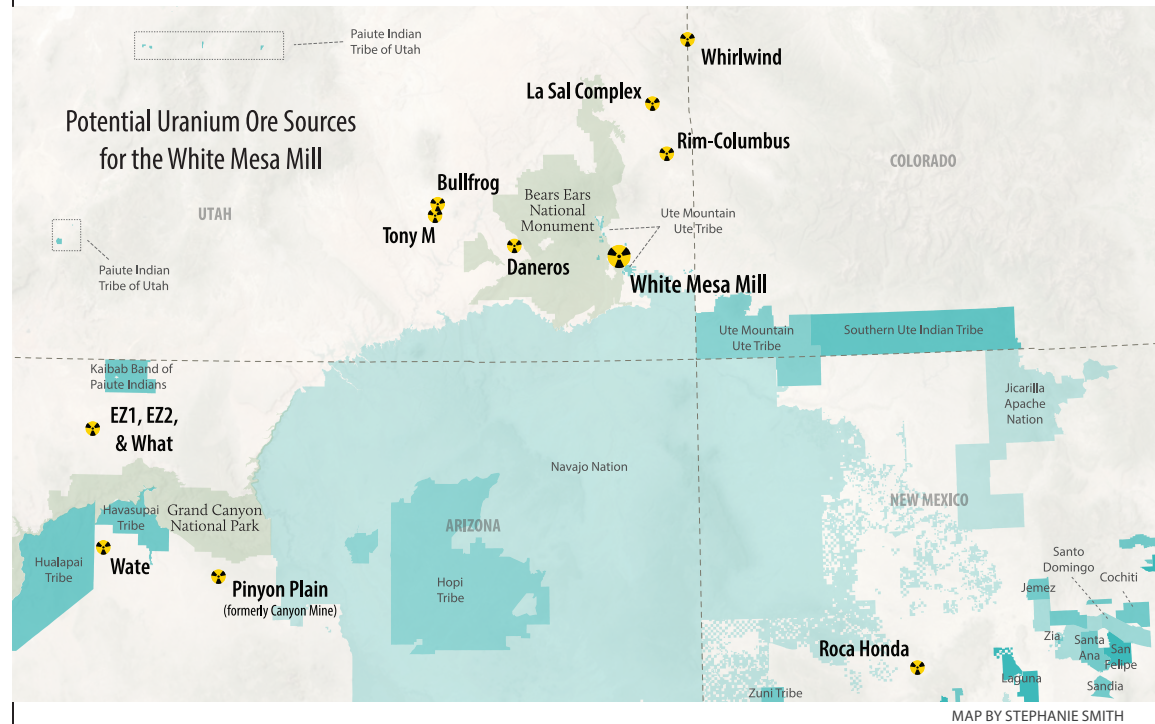
### When was it built?

The mill was built in the late 1970s. It received its license to operate in 1980. It was originally designed to run for 10-15 years, processing uranium in rocks into concentrated uranium. More than 40 years later, it's still going, and its business has changed. It doesn't just process uranium from rock; it also processes radioactive wastes from other contaminated places across the United States and the world.

White Mesa is part of a cultural landscape that has been inhabited by Indigenous peoples for millennia and remains vital to the cultural and spiritual lives of Indigenous peoples to this day. Ancestors left behind many cultural sites on the mesa. When the White Mesa Mill and its waste pits were built, they disturbed many archaeological sites dating back to the Ancestral Puebloan periods including kivas and burial sites.

### Who owns the mill?

The White Mesa Mill is owned by Energy Fuels Resources USA, Inc., a private company based in Lakewood, Colorado, near Denver. It's the American subsidiary of a larger uranium company based in Toronto, Canada called Energy Fuels International, Inc. While the ownership of the mill has changed on paper (Energy Fuels Nuclear, UMETCO, International Uranium Corporation, Denison Mines), many of the on-site staff and corporate executives have been the same people over the years.



Ancestral Puebloan kiva dating to the 1200s, part of an archaeological site destroyed by the construction of the White Mesa Mill.

### What happens at the mill?

Trucks deliver rocks dug up at uranium mines. These rocks have natural uranium ore in them. The mill crushes the rocks and uses chemicals to get the uranium ore out. The mill also extracts vanadium to sell for use in steel and batteries. Vanadium is a toxic element used to make steel alloys and batteries, and is often found with uranium during mining.

Trucks deliver waste from in-situ recovery sites, places where weak acid liquid is pumped into the ground to dissolve the uranium and the uranium is pumped out. Wastes from this process are also taken to the mill for direct disposal in the waste pits.

Trucks also deliver big drums, barrels, and bags of radioactive materials — waste from contaminated places across the United States and the world that have some uranium in them. The mill calls these wastes “alternate feeds.” The mill runs these wastes through the mill and uses chemicals to separate out the uranium.

After processing, the byproducts or leftovers are stored forever in waste pits at the mill. The mill also receives uranium wastes that are poured directly into the mill’s waste pits without being processed by the mill first.





ANDREW PAFFRATH, LANTERN CITY MEDIA

### Where does uranium from the mill go?

The mill turns uranium into a yellow powder called "yellowcake." This yellow powder is sent somewhere else to be turned into fuel for nuclear power plants to create electricity. The mill dumps the chemicals and leftover rocks into giant waste pits outside.

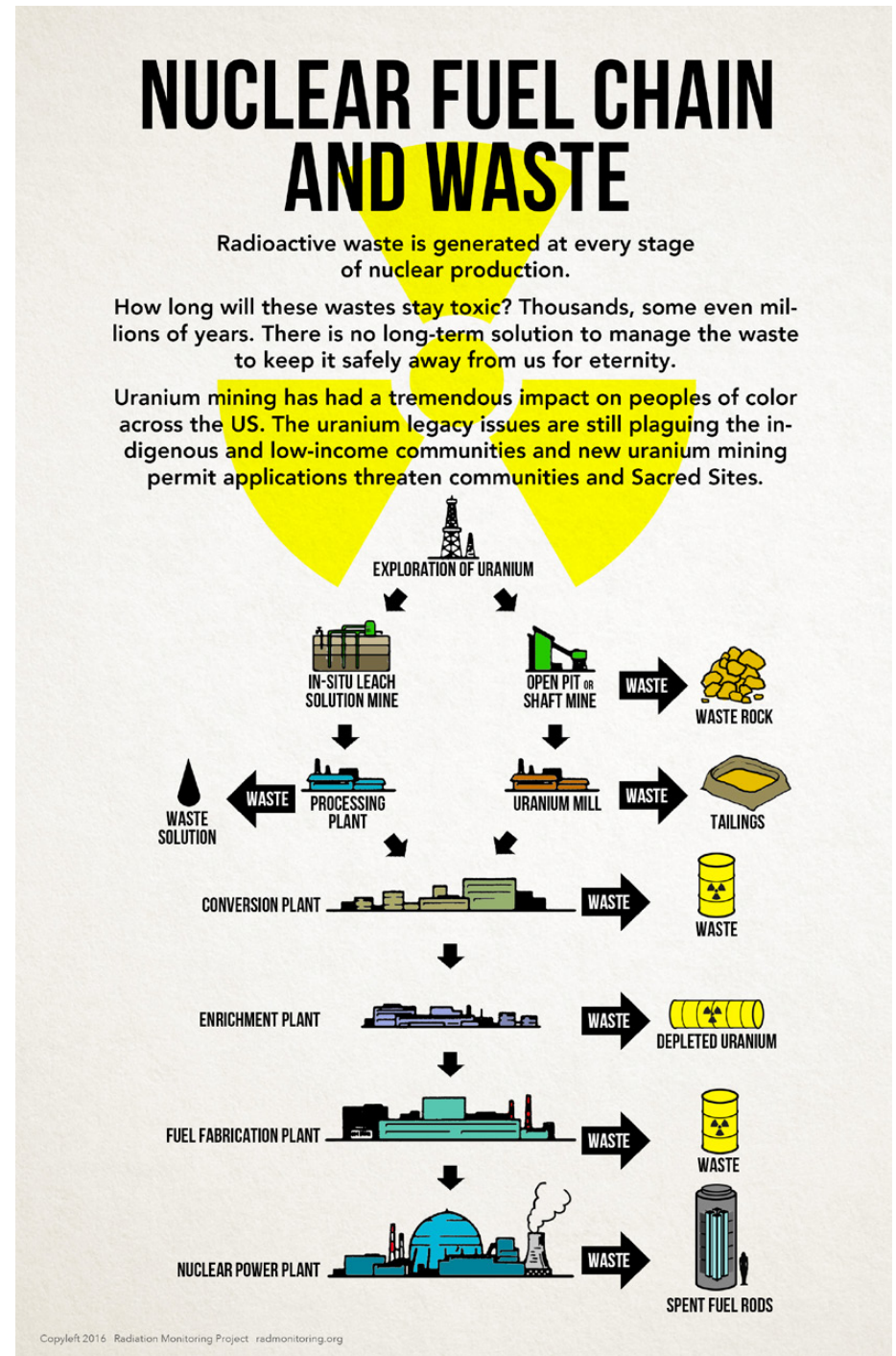
### Where does the leftover waste go?

Leftover dirt, rock, and chemicals from the natural uranium ore are called "tailings."

Leftover waste from uranium processing is called "alternate feed waste."

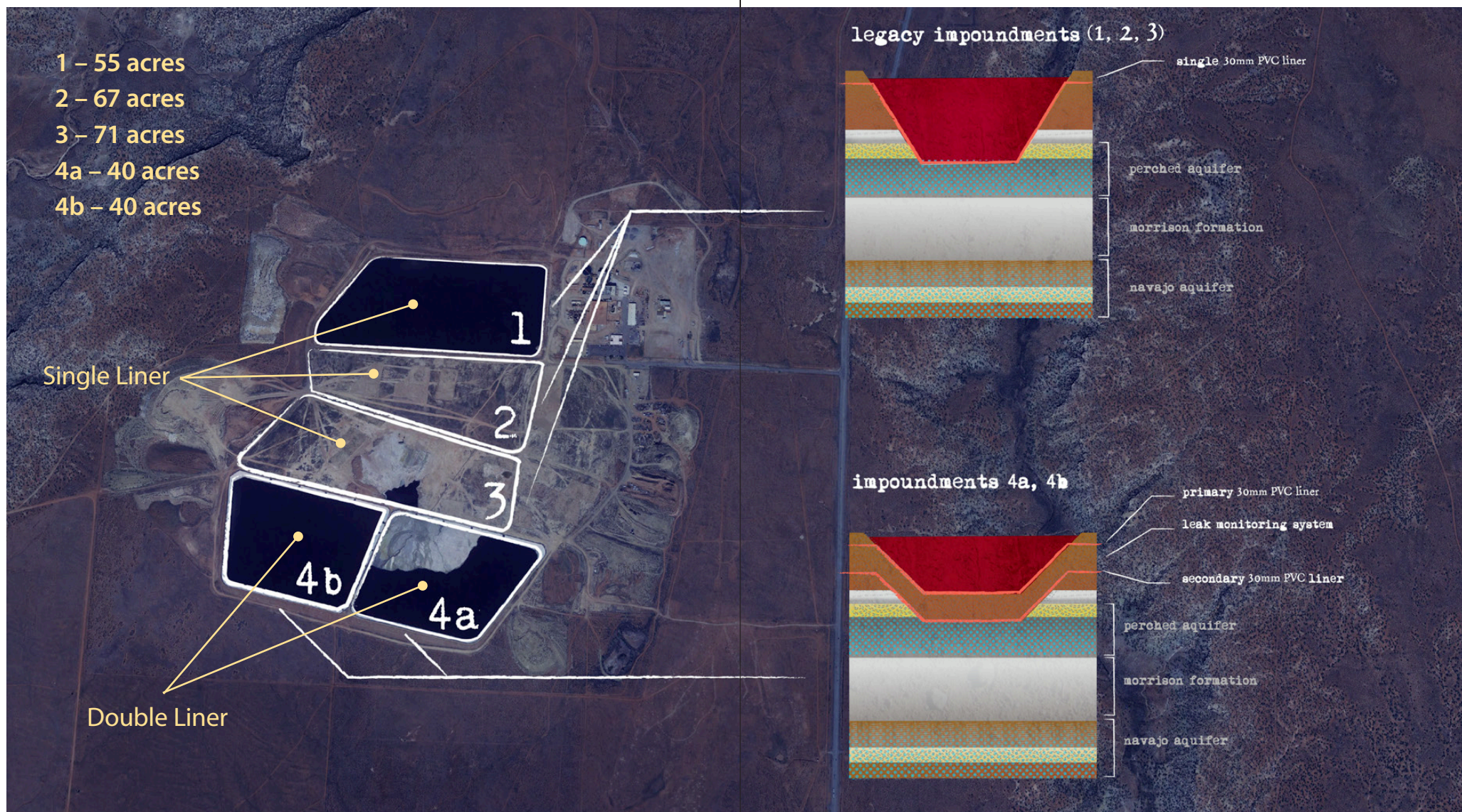
All the leftovers are dumped in big open-air waste pits or ponds called "cells" or "tailings impoundments."

While the uranium is sold and sent away from the mill, the leftovers are dumped in the waste pits and stay at the mill site.



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The mill has five large waste pits covering about 275 acres.<sup>6</sup>



ANDREW PAFFRATH, LANTERN CITY MEDIA

### What keeps the waste pits from leaking?

The mill's three oldest waste ponds are lined with a single layer of thin plastic (30 mil PVV or polychloride) with crushed rock and clay underneath it. Sometimes the liners leak. If liners crack or leak, radioactive waste in the pits could escape into the shallow groundwater below. There are leak detection systems under these ponds that are supposed to activate when there is a leak.

The mill's two newer waste pits have double liners of thicker plastic (60 mil high density polyethylene) with a system to detect leaks sandwiched between them.

The mill has plans to expand and has applied to build two waste pits even closer to the White Mesa Community.

### Why are some of the waste pits covered in liquid?

The pits contain toxic and radioactive waste that can cause cancer. The waste also emits radon, an invisible, odorless gas that can cause cancer.

The mill is supposed to cover two of the waste pits with liquid because liquid is a barrier to stop radon from getting into the air. The liquid cover is meant to limit the area that is emitting radon.

When a waste pit is full, the company is required to dry it out and cover it with a thick layer of compacted dirt to create a radon cap (usually around four feet high) and then an engineered cap made out of clay, gravel, and soil that sometimes has vegetation planted on top to protect public health and the environment. The cap is supposed to last for 1,000 years.



Waste pits known as Cell 4a (top) and Cell 4b (bottom) at the White Mesa Mill. By law, solid materials in the holding and processing ponds at the mill are required to be covered in liquid, which acts as a barrier to cancer-causing radon gas emitted by the materials in the pond. TIM PETERSON, ECOFLIGHT

**“Why can’t they listen to us people  
that live on this reservation?  
My people are sick!  
And they won’t listen.”**

— Thelma Whiskers,  
Ute Mountain Ute Elder, White Mesa Community



TIM PETERSON

## THE RADIOACTIVE WASTE BUSINESS AT THE WHITE MESA MILL

### What are “alternate feeds”?

Alternate feeds are what the mill calls radioactive wastes that may have some uranium in them.

Other companies send these wastes to the mill. Sometimes, these wastes have caused contamination and health problems in their original locations.

Companies sometimes pay the mill to take their wastes.

### Where do the radioactive wastes come from?

Factories, mines, and military and industrial sites across the United States, from New York to Washington state, and as far away as Canada, Japan, and Estonia have sent their wastes to White Mesa.

SEE MAP ON THE NEXT PAGE



### Do wastes come from other tribal lands?

Yes. Waste has been sent from the Spokane Indian Reservation in Washington and the Cherokee Nation in Oklahoma, and from lands near the borders of the Muscogee (Creek) Nation in Oklahoma, and the Mississauga First Nation in Canada. The mill’s owner hopes to bring abandoned uranium mine waste from the Navajo Nation and contaminated water from Pinyon Plain Mine (formerly Canyon Mine) near the Havasupai Tribe’s sacred site of Red Butte in Arizona to White Mesa.

### How much waste has been sent to the mill?

At least 700 million pounds. It’s hard to know the exact amounts because that information is not made public.



SOURCES: GRAND CANYON TRUST, ESRI, HERE, GARMIN, FAO, NOAA, USGS, UTAH GEOSPATIAL RESOURCE CENTER, SAFEGRAPH, FAO, METI/NASA, BUREAU OF LAND MANAGEMENT, EPA, NPS, CGIAR; UPDATED MAY 2022

## WHITE MESA COMMUNITY CONCERNS

### What is the bad odor we smell coming from the mill?

The mill pumps out air pollutants including sulfur dioxide and nitrogen oxide that smell bad. Also, winds blow across the waste pits, which contain solvents that are highly acidic or kerosene-based, and you can smell that in White Mesa.

### What is in the dust that blows from the mill on windy days?

It could be soil, or it could contain dust from the big piles of natural uranium ore dumped outside the mill waiting to be processed. When processing, the mill also sends uranium and other metal particles out of its smokestacks from the drying ovens.

The mill and its waste ponds also produce radon. As uranium breaks down and decays, radon — an invisible, odorless, tasteless, radioactive gas — forms solids that can cling to blowing dust. If you breathe radon in, it can get trapped in your lungs. As it breaks down, the solids can damage your lung tissue and lead to lung cancer.

Radon is the number one cause of lung cancer among non-smokers.

### Is water in White Mesa safe to drink?

Yes. We have a water treatment facility that uses filters to remove contaminants. The Tribe's staff samples the water regularly to make sure it is safe.

Drinking water in White Mesa comes from the very deep Navajo Aquifer. The aquifer is like a giant underground lake. Water in the aquifer has metals and minerals in it, including arsenic, sulfur, iron, and manganese. Some of these are not safe to drink, and we filter them out.

Some of the pipes that deliver the water in White Mesa are very old, and the system has a dead end on Mesa View Drive. These infrastructure issues are being fixed as funding allows.



The White Mesa Mill. TIM PETERSON

### Why does our water in White Mesa smell and taste bad?

The bad smell and metallic taste of water in White Mesa may come from old pipes.

People who live on the south end of White Mesa have water that smells and tastes bad because the underground pipe dead-ends there, and the water sits and stagnates. The Tribe plans to add an underground loop to the pipe at the south end of town so that the water can flow and will taste and smell better.

The Tribe is working to upgrade and replace a leaking water tank and underground pipes.



White Mesa Community members lead an annual spiritual walk to protest the White Mesa Mill. TIM PETERSON

### Groundwater under the White Mesa Mill

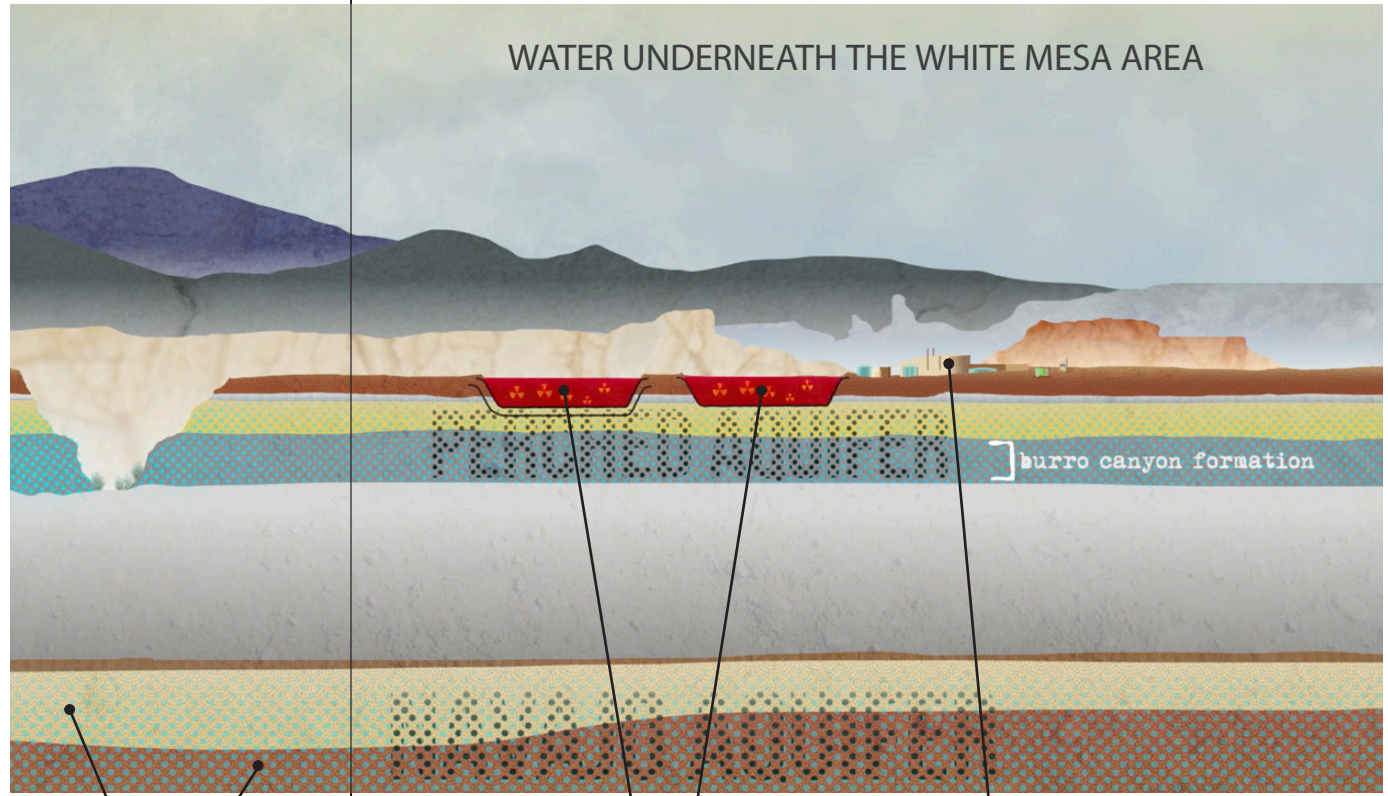
There are two main layers of underground water underneath the mill.

One is a shallow layer of groundwater called the Burro Canyon Formation. The Burro Canyon Formation is shallow (approximately 100 feet below ground) and its water comes from rain and snowmelt that trickles down through the sandstone.

The bottoms of the waste pits at the White Mesa Mill sit in the Burro Canyon Formation.

About 100 feet under the mill is the Morrison Formation. This rock layer has a lot of clay. Water can't flow through it as easily, so it flows horizontally and comes out as springs and seeps.

The second layer of underground water is the very deep Navajo Aquifer. It is a giant underground lake, about 1,200 feet underground. This is where drinking water in White Mesa comes from.



ANDREW PAFFRATH, LANTERN CITY MEDIA

WHITE MESA  
DRINKING WATER

WASTE PITS

WHITE MESA MILL



JUSTIN CLIFTON

### Is the mill contaminating drinking water in White Mesa?

So far, there is no evidence that drinking water in the White Mesa Community has been contaminated by the mill.

Drinking water in White Mesa comes from deep underground. There are chemicals in the water underneath the mill, but that water is shallow, 800 to 1,000 feet above where our drinking water comes from.

However, people in White Mesa worry that contamination from the mill could eventually leak down and poison our drinking water.

The Tribe's environmental staff samples springs and wells in White Mesa to study the spread of contamination and make sure the water is safe.

The Tribe's environmental staff is concerned that chemicals from the mill could leak into the Burro Canyon Formation and flow out at springs and seeps. These springs are important to our culture and to animals and plants. The Tribe is also concerned that contamination from the mill could eventually travel through the clay in the Morrison Formation and get into the Navajo Aquifer, where our drinking water comes from.

This is why the Tribe wants the mill closed and cleaned up.

## HIGHWAY SAFETY

### How does radioactive waste get to the mill?

It arrives by truck. These trucks are typically large and might look like dump trucks or semitrucks. Other trucks carry in-situ leachate waste (from uranium mines where uranium is dissolved underground with chemicals) and some trucks deliver chemicals to the mill.

### How many trucks drive to the mill carrying waste?

Many. The exact number isn't public. The exact routes the trucks follow aren't public information either.

### What happens if there is an accident?

Trucks carrying radioactive wastes to the mill have spilled waste along the highway in the past, especially near the mill entrance.

Depending on what kind of waste spills, the company transporting the waste may have to contact federal and state government agencies. Companies can be fined for spills, but often do not have to pay a fine.

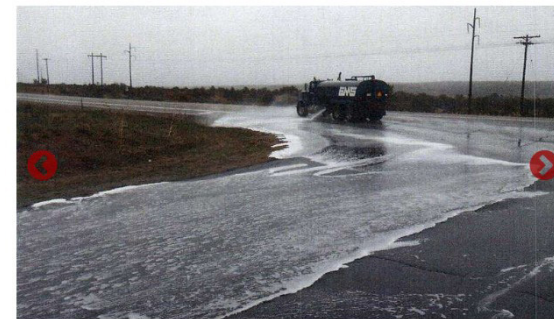
### Uranium mine avoids fine for spilling radioactive waste on highway in Southern Utah



Cameco's shipments halted until remedied

By Jim Mimiaga

Tuesday, Jul 11, 2017 2:07 PM



A Cameco Resources truck leaked radioactive sludge onto U.S. Highway 191 on March 28-29, 2016, triggering a review by federal nuclear regulators.

Courtesy of Nuclear Regulatory Commission



### How will people in White Mesa know if there is a spill?

San Juan County Emergency Services should notify people if there is a health hazard. Mill owners refuse to notify the Tribe directly.





All photos: The White Mesa Concerned Community spiritual walk to protest the White Mesa Mill.

TIM PETERSON

## HEALTH QUESTIONS



### Is the mill making our people sick?

We don't know. The Tribe received a grant from the federal government to study people's health in White Mesa. If you live in White Mesa, please join the Health/Home Survey and share your health concerns so we can understand what is causing health problems in White Mesa. This is the first step in a long-term study.

### Are the animals and plants that live near the mill healthy?

We don't know. Birds fly over the mill and could land on the ponds. Animals can get through the mill's fence. Some people who live in White Mesa have stopped collecting plants or hunting near the mill. Uranium and vanadium from the mill have been detected at a spring east of Highway 191. Animals that drink there may consume those contaminants. This is not a constant situation; we mainly see high levels of uranium and vanadium after storms.



## CONTACTS

### Who do I ask if I have questions?

If you have questions, need support, or want to join the public Health/Home Study in White Mesa, contact:



#### **Ute Mountain Ute Tribal Environmental Programs Department**

Environmental Programs Department  
970-564-5340

UteMountainUteEnvironmental.org

If you have questions, want to support the local community, or want to join the fight to close and clean up the mill:



#### **White Mesa Concerned Community**

Yolanda Badback  
ybadback427@gmail.com  
ProtectWhiteMesa.org

### Who regulates the mill?

#### **The state of Utah**

Utah is what is called an “agreement state.” That means the state of Utah, not the federal Nuclear Regulatory Commission, regulates the White Mesa Mill.

If you want to talk to the state officials in charge of the mill, you can contact:

#### **Utah Division of Waste Management & Radiation Control**

Phil Goble, pgoble@utah.gov,  
Permitting and Licensing Activities:  
801-536-4044

#### **Utah Division of Air Quality**

Jay Morris, jpmorris@utah.gov, Compliance Activities: 801-536-4079

#### **The U.S. Environmental Protection Agency**

The EPA also plays a role in regulating the mill. To share your concerns with the EPA, you can contact:

US EPA, Region 8  
1595 Wynkoop Street  
Denver, CO 80202-1129  
303-312-6312  
r8eisc@epa.gov

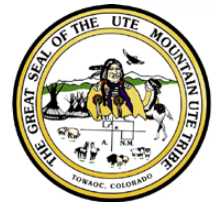
## ENDNOTES

- <sup>1</sup> Centers for Disease Control and Prevention. “Radioisotope Brief: Uranium.” January 21, 2022. <https://www.cdc.gov/nceh/radiation/emergencies/isotopes/uranium.htm#:~:text=Inhaling%20large%20concentrations%20of%20uranium,of%20the%20bone%20or%20liver>.
- <sup>2</sup> U.S. Environmental Protection Agency. “Uranium in the Environment.” February 16, 2023. <https://www.epa.gov/radiation/radionuclide-basics-uranium>.
- <sup>3</sup> U.S. Department of Energy. “DOE Explains...Radioactivity.” Office of Science. <https://www.energy.gov/science/doe-explainsradioactivity>.
- <sup>4</sup> Munroe, Randall. “Radiation Dose Chart.” <https://xkcd.com/radiation/>.
- <sup>5</sup> Centers for Disease Control and Prevention. “Radioisotope Brief: Uranium.” January 21, 2022. <https://www.cdc.gov/nceh/radiation/emergencies/isotopes/uranium.htm#:~:text=Inhaling%20large%20concentrations%20of%20uranium,of%20the%20bone%20or%20liver>. U.S. Environmental Protection Agency. “Health Effects of Uranium.” <https://www.epa.gov/navajo-nation-uranium-cleanup/health-effects-uranium>.
- <sup>6</sup> Letter from Jo Ann Tischler, Director Compliance and Permitting, Denison Mines (USA) Corp., to M. Cheryl Heying, Executive Secretary, Utah Air Quality Board, State of Utah Department of Environmental Quality. “Re: Denison Mines White Mesa Mill Application for Approval of Modification of an Existing Source Under 40 CFR 6107 State of Utah Division of Air Quality Approval Order Number DAQEAN011205000808.” (See: Total acreage of impoundment cells in Table 1: Cell Specifications, totaling 273 acres.) April 13, 2010. pp. 5-6. [https://www.grandcanyontrust.org/sites/default/files/WhiteMesaAlternateFeeds/Report/White\\_Mesa\\_Mill\\_Impoundment\\_Sizes.pdf](https://www.grandcanyontrust.org/sites/default/files/WhiteMesaAlternateFeeds/Report/White_Mesa_Mill_Impoundment_Sizes.pdf).



Environmental Programs  
Department  
970-564-5340

[UteMountainUteEnvironmental.org](http://UteMountainUteEnvironmental.org)



Ute Mountain Ute Tribe



Thelma Whiskers (left) and Yolanda Badback lead the annual White Mesa Concerned Community Spiritual Walk to protest the White Mesa uranium mill. **BRADLEY ANGEL**