

2024 - 2028 Grants Mining District Five-Year Plan



DRAFT

for Public Comment

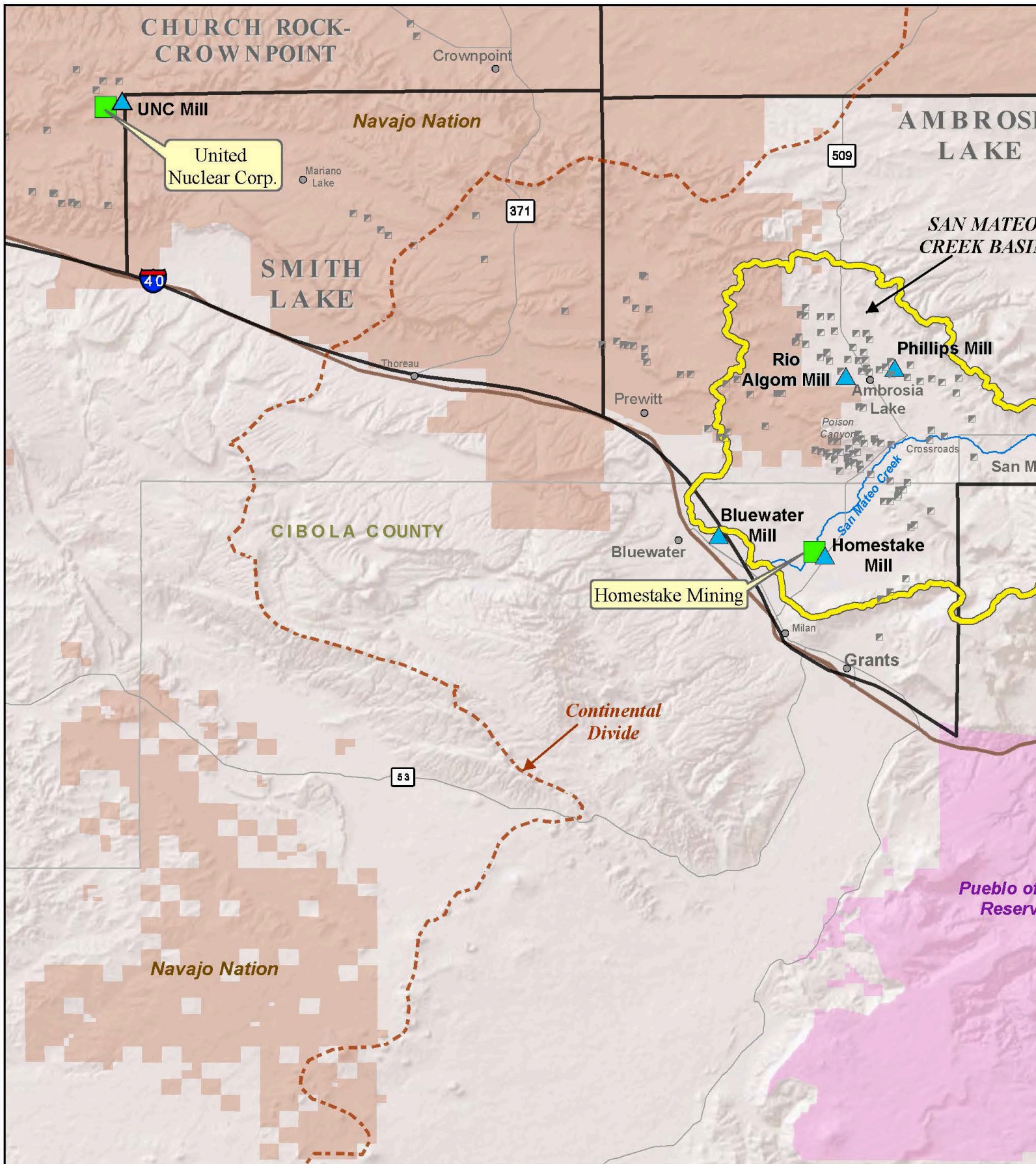
A photograph of a collapsed metal structure, possibly a mine entrance or a small building, in a desert landscape. The structure is made of dark metal beams and is tilted and broken. The ground is dry and rocky with some sparse green vegetation. In the background, there are rolling hills and mountains under a bright blue sky with scattered white clouds.

On the Cover: Section 10 Mine Site in Ambrosia Lake

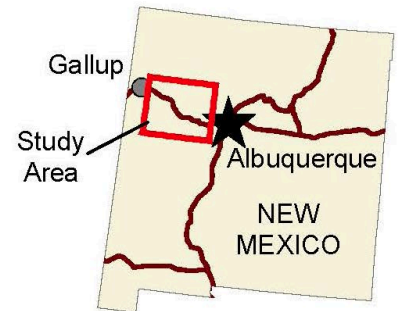
On this Page: Spencer Uranium Mine before Reclamation

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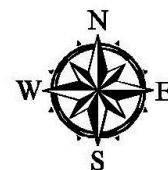
Legacy of Uranium Mining in Northwestern New Mexico



Mining District Features

- Abandoned Uranium Mine
- Uranium Mill
- Uranium Related NPL Site
- San Mateo Creek
- Continental Divide
- San Mateo Creek Basin
- Uranium Sub-District
- County Boundary
- Pueblo of Acoma
- Pueblo of Laguna
- Navajo Nation Administrative Area

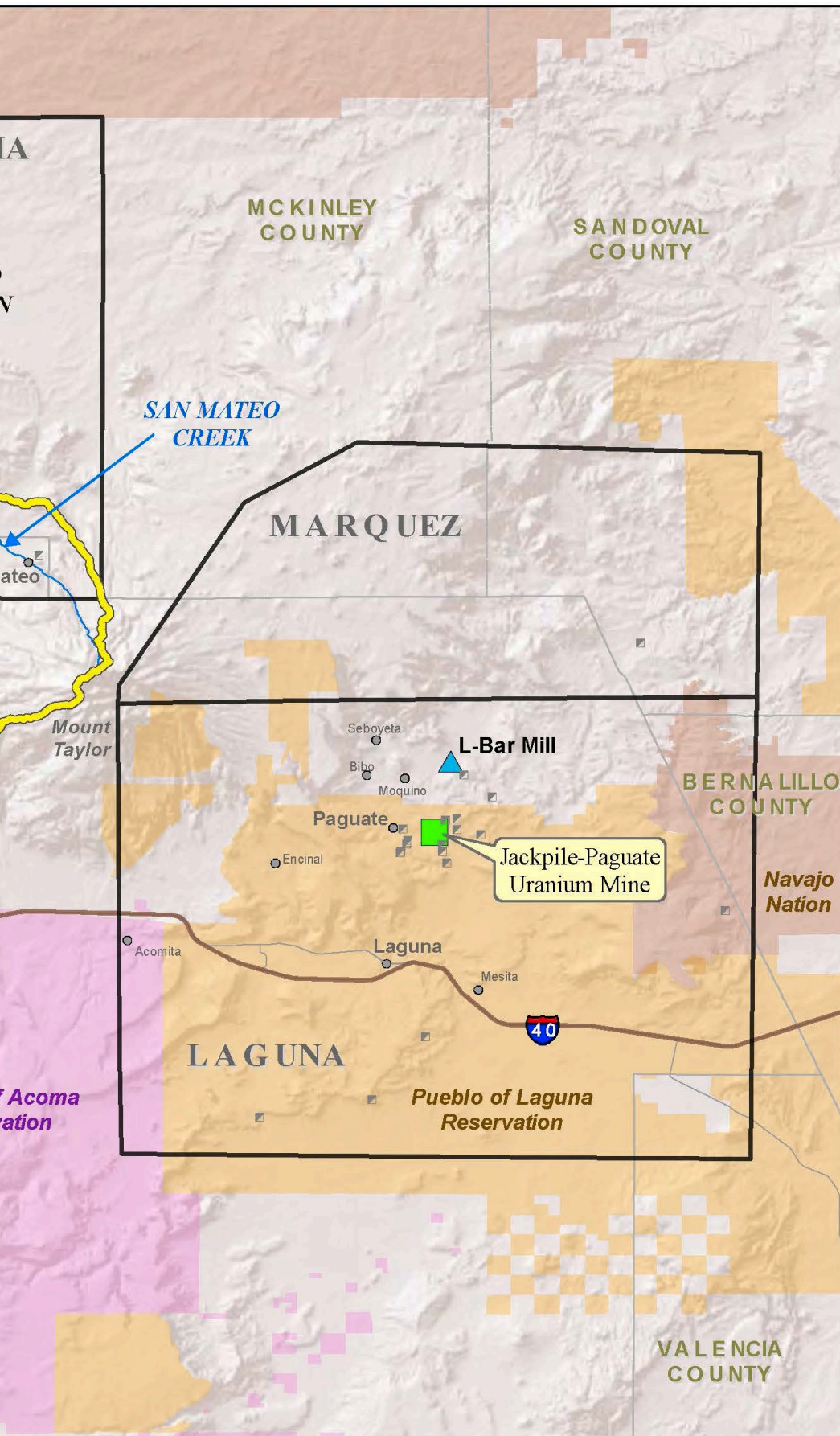
Sources:
MMD Legacy Uranium Mine Inventory, 12/2008.
EPA Region 6 National Priorities List (NPL), 1/2018.
Navajo Land Department 2016. US Census Bureau
2010 TIGER/Line. Esri World Shaded Relief.



EPA Region 6
Superfund
GIS Support
01/31/2018



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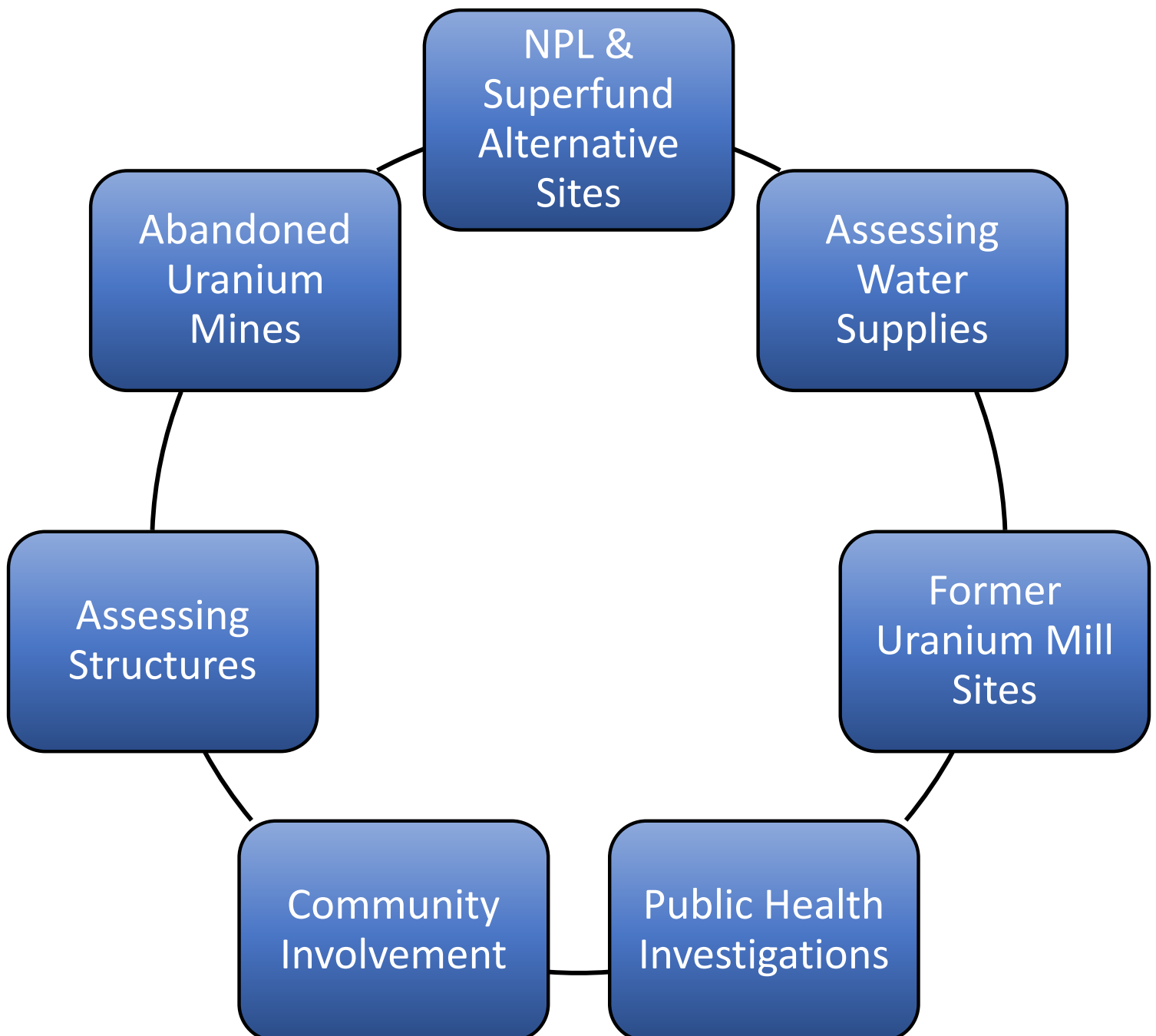
Acronyms

AEC – Atomic Energy Commission
AML – Abandoned Mine Lands
ARCO – Atlantic Richfield Company
ASAOC – Administrative Settlement and Agreement on Consent
ATSDR – Agency for Toxic Substances and Disease Registry
AUM – Abandoned Uranium Mine
CCP – Closeout/Closure Plan
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
BLM – Bureau of Land Management
DOD – Department of Defense
DOE – Department of Energy
DRUM – Defense Related Uranium Mine
EE/CA – Engineering Evaluation/Cost Analysis
EPA – Environmental Protection Agency
FS – Feasibility Study
GMD – Grants Mining District
MCL – Maximum Contaminant Level
NCP – National Contingency Plan
NMAC – New Mexico Administrative Code
NMED – New Mexico Environment Department
MMD – New Mexico Mining and Minerals Division
NMDOH – New Mexico Department of Health
NMWQCC – New Mexico Water Quality Control Commission
NPL – National Priorities List
NRC – Nuclear Regulatory Commission
OU – Operable Unit
PRP – Potentially Responsible Party
RAML – Rio Algom Mining, LLC
RA – Remedial Action
RD – Remedial Design
RD/RA Remedial Design/Remedial Action
RI – Remedial Investigation
RI/FS – Remedial Investigation/Feasibility Study
ROD – Record of Decision
RSE – Removal Site Evaluation
SA Approach – Superfund Alternative Approach
SMCB – San Mateo Creek Basin
UMTRCA – Uranium Mill Tailings Radiation Control Act
UNC – United Nuclear Corporation
USACE – United States Army Corps of Engineers
USFS – United States Forest Service

Purpose

The purpose of Grants Mining District 2024 – 2028 Five-Year Plan is to report to the public the progress made in implementing prior five-year plans and to memorialize priorities and activities for the next five years in the Grants Mining District (GMD). The plan is intended to promote and advance the assessment and cleanup, when warranted, of contamination caused by legacy uranium mining and milling operations. Preceding this plan was the 2010-2014 Grants Mining District Plan and the 2015-2020 Grants Mining District Plan. Work accomplished during the interim period between the second and third plans is identified in this document.

The seven objectives for this Five-Year Plan are designed to guide the efforts in the GMD. Each objective identifies goals with specific actions to be taken in the next five years by those agencies with the authority and responsibility. Although the objectives are presented as standalone subjects in the plan, they are intertwined.



Partners to the Five-Year Plan

Federal, state, and tribal governmental agencies are partners to the plan. They are committed to continue to assess and address legacy contamination and to eliminate, reduce or manage risks to human health and the environment. Each partner has certain authorities that are defined by statute and/or regulations, or tribal sovereignty. Oftentimes these authorities overlap or sites may be situated on “mixed ownership” land, requiring careful planning and communication between partners and communities.



U.S. Environmental Protection Agency Region 6

The United States Environmental Protection Agency (EPA) Region 6's role is to implement the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as the Superfund Law, and the National Contingency Plan (NCP), which provides the framework for EPA to respond to releases of hazardous substances. EPA Region 6's efforts are focused on private land and tribal land in the State of New Mexico apart from the Navajo Nation. Superfund does not regulate permitting of new mines.

U.S. Department of Energy – Office Legacy Management

The U.S. Department of Energy's Office of Legacy Management (DOE-LM) has two roles in the Five-Year Plan. The first role is implementing the Uranium Mill Tailings Radiation Control Act (UMTRCA) through the cleanup of twenty-two uranium mill sites that were inactive and unregulated at the time UMTRCA was promulgated in 1978 (known as Title I sites), and the long-term surveillance and maintenance of uranium mill sites that were active when UMTRCA was promulgated (known as Title II sites). The second role for DOE-LM is assessment of thousands of uranium mine sites across the U.S. under the Defense Related Uranium Mines (DRUM) Program's Verification and Validation (V&V) Program. DOE does not have authority to cleanup uranium mines and instead shares information from the V&V Program with federal land managers, tribes, and property owners.



U.S. Department of the Interior – Bureau of Land Management

The Bureau of Land Management (BLM), an agency within the U.S. Department of Interior, manages much of the country's public lands. The BLM is the lead agency for mines on their land and can use various authorities under the Federal Land Policy and Management Act, the General Mining Law of 1872, and CERCLA to address mining and its impacts on public lands.

Agency for Toxic Substances and Disease Registry

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal public health agency of the U.S. Department of Health and Human Services. ATSDR can conduct Public Health Assessments (PHA) which evaluate data and information on the release of hazardous substances into the environment to assess impacts on public health, develop health advisories or other recommendations, and identify studies or actions needed to evaluate and mitigate or prevent human health effects.



U.S. Nuclear Regulatory Commission

The NRC regulates the operation of uranium mills and the decontamination, decommissioning, reclamation, closure and, if necessary, groundwater corrective action of uranium mill sites through the issuance of a source materials license to the operator (Title II UMTRCA sites). Once such activities are completed, NRC issues a general license to DOE-LM, the custodian, for the long-term surveillance and maintenance of Title II sites.

U.S. Department of Agriculture – Forest Service

The U.S. Forest Service (USFS), an agency within the U.S. Department of Agriculture, manages public lands in the national forests. USFS oversees mineral extraction and reclamation and can use its CERCLA authority to address hazardous substances on national forest land.



Pueblo of Acoma Department of Natural Resources

The Acoma Department of Natural Resources (DNR) assists the Pueblo of Acoma's government and its programmatic offices in providing land management and other activities. Federal agencies work closely with the Acoma DNR and provide briefings to Pueblo of Acoma officials.

Pueblo of Laguna Environmental and Natural Resources Department

The Pueblo of Laguna Environmental and Natural Resources Department (Laguna ENRD) monitors and protects the environmental quality of Pueblo of Laguna air, land, and water for the health benefit of current and future generations of Pueblos. Federal agencies work closely with the Laguna ENRD and provide briefings to Pueblo of Laguna officials.

New Mexico Department of Health

The New Mexico Department of Health (NMDOH) objective is to promote, preserve and protect the health of residents of New Mexico. As a partner to this plan, NMDOH's APPLTREE Program coordinates efforts with ATSDR to address health concerns about environmental exposures from community members or stakeholders and provide health consultations as deemed necessary when there is new environmental data available.



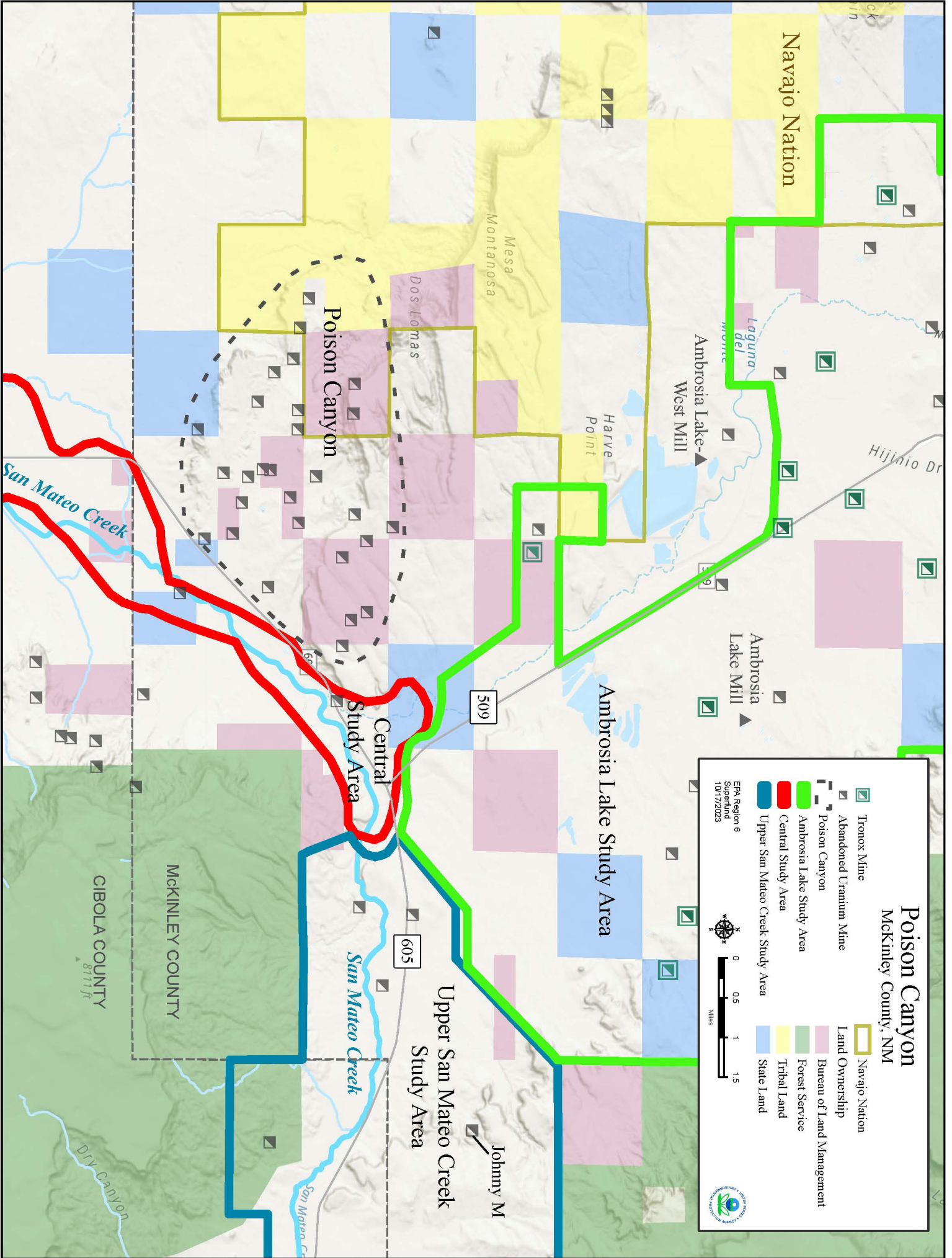
New Mexico Environment Department

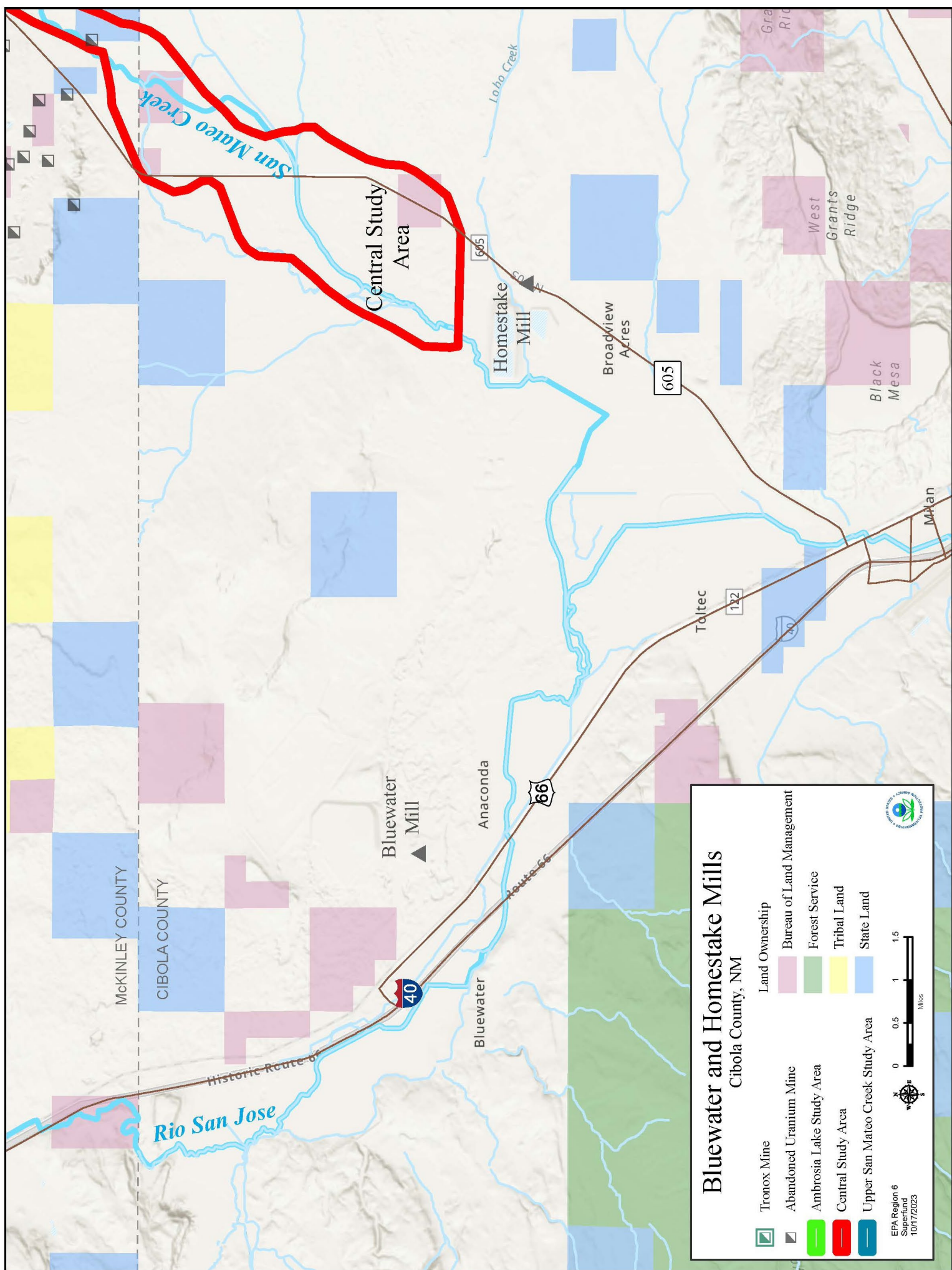
New Mexico Environment Department's (NMED) role in the GMD is to ensure protection and abatement of groundwater and surface water through enforcement of the groundwater and surface water protection rules in 20.6.2 and 20.6.4 of the New Mexico Administrative Code (NMAC). NMED currently regulates and oversees groundwater quality protection through issuance of groundwater discharge permits in accordance with New Mexico Water Quality Control Commission (NMWQCC) permitting regulations that were promulgated in 1978 pursuant to the New Mexico Water Quality Act. Some of the previously permitted operational mines are undergoing groundwater assessment, abatement, and closure pursuant to NMWQCC regulations. NMED also supports EPA, NRC, and DOE at Superfund and UMTRCA sites.

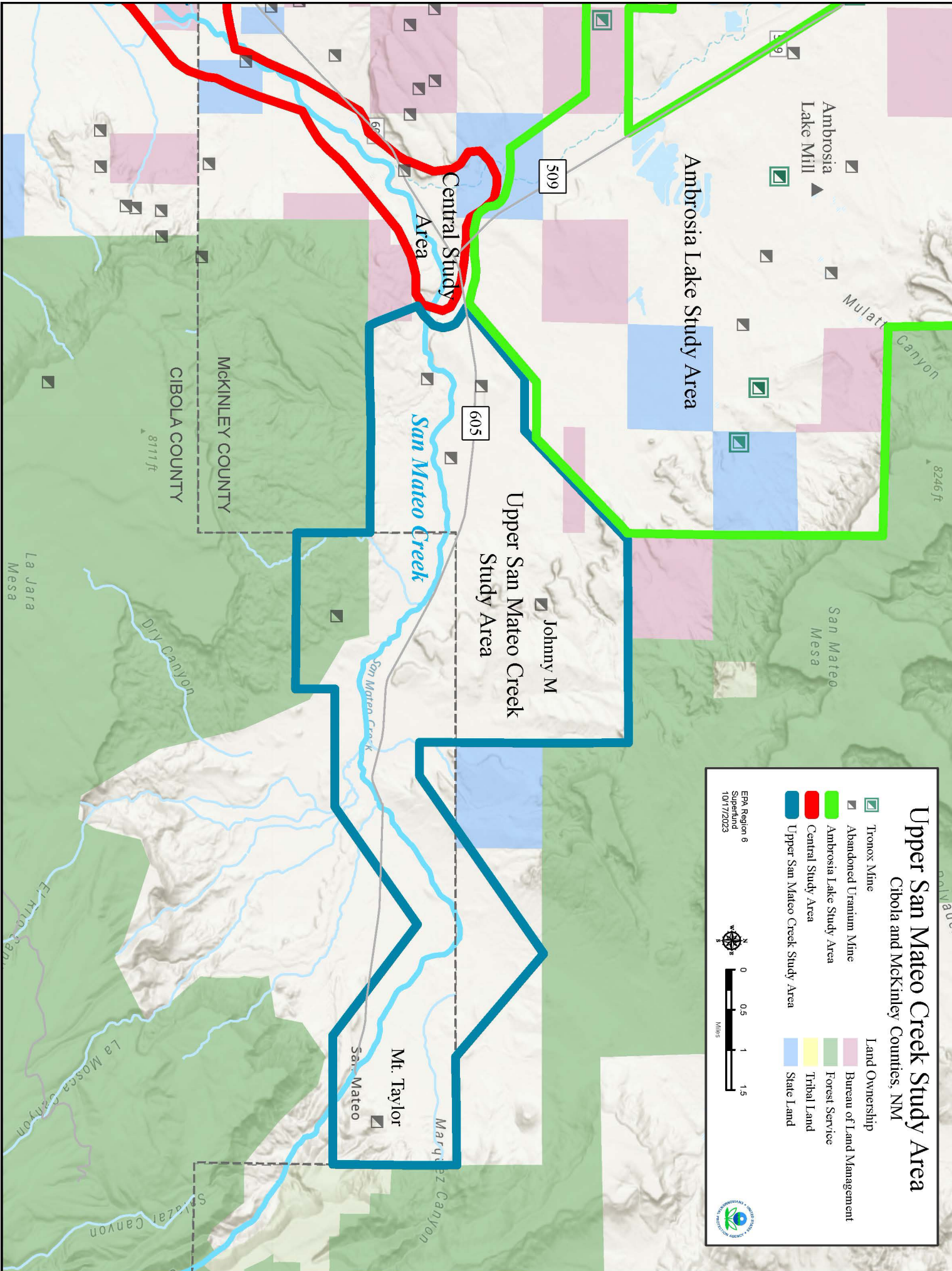
New Mexico Energy, Minerals, and Natural Resources Department – Mining and Minerals Division

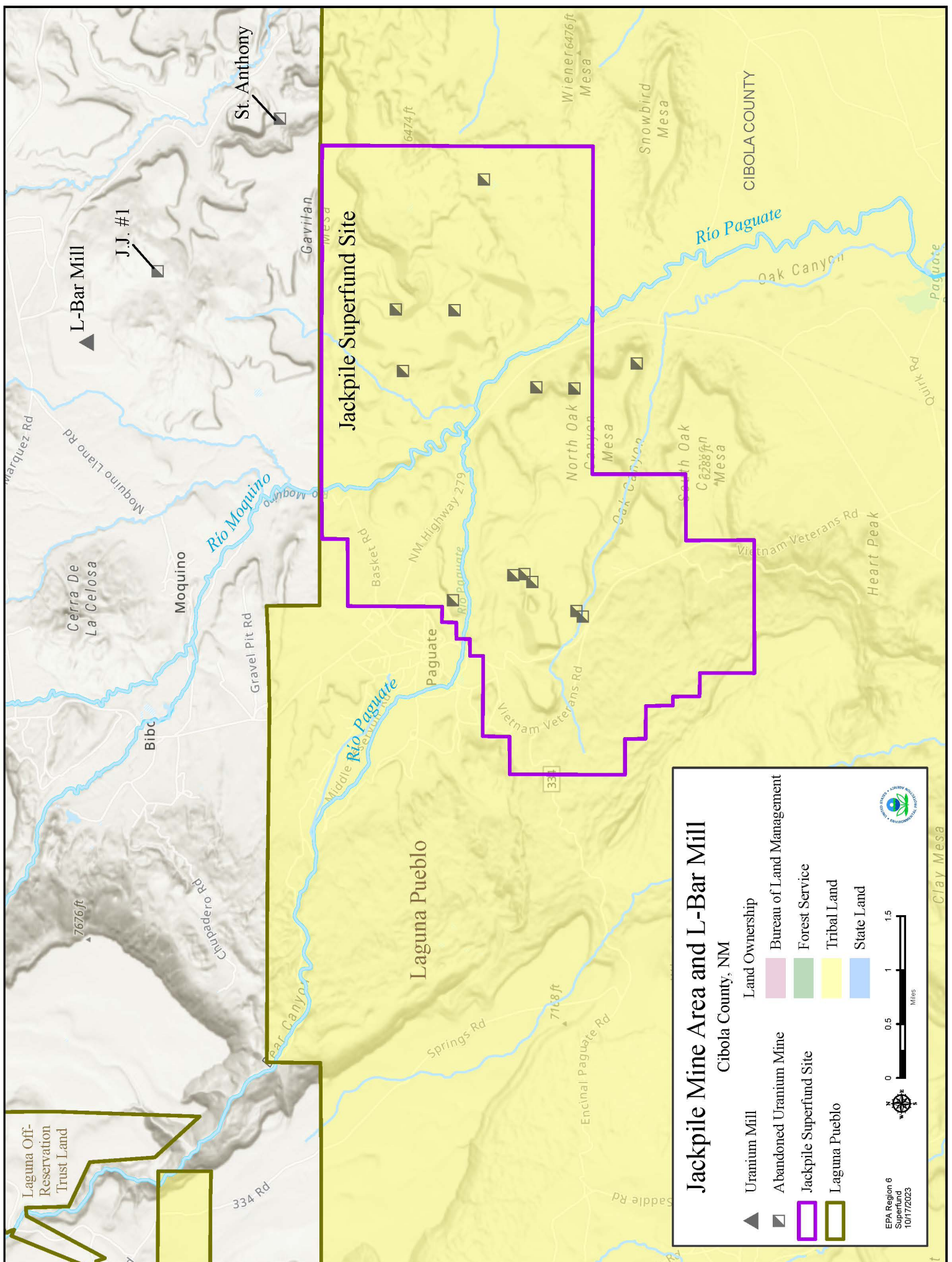
New Mexico Mining and Minerals Division's (MMD) permits mining and reclamation operations on state land, private lands, and federal lands, in New Mexico. The permitting and enforcement authority falls under the NM Mining Act of 1978, and NM Mining Act Rules, 19. 10 NMAC. The intent of the Mining Act is the address environmental impacts during and after mining operations with surface reclamation measures established in the rules and permits.











Overview of the Five-Year Plan

The plan is divided into seven focal points.

National Priority List and Superfund Alternative Sites

The NPL is the list of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. The Superfund Alternative (SA) approach uses the same investigation and cleanup process and standards that are used for sites listed on the NPL. EPA Region 6 Superfund Remedial Program is the lead on these sites.

Assessment of water supply sources for contamination

Water is a precious resource in New Mexico and most residents in the GMD obtain their water from groundwater sources, either from private or municipal water supply wells. Ensuring water supplies are not contaminated supports providing reliable water sources for the communities impacted by mining.

Assess and cleanup legacy uranium mines

Uranium mining was prolific in the GMD, starting in the 1940's until as late as the mid-1980's. The extraction of uranium-bearing ore occurred through open pits, from underground workings that were extensively connected, and solution mining; all of which has impacted the environment to varying degrees. Assessing and cleaning up abandoned uranium mines, where warranted, reduces the risk to human health.

Assess, cleanup, and perform long-term management of former uranium milling sites

Six legacy uranium milling operations are in the GMD. These sites are either undergoing cleanup or have been cleaned up under UMTRCA with regulatory oversight. The cleanups and ultimate long-term surveillance and maintenance are necessary to ensure protection to human health and the environment.

Assess and clean up contaminated structures and properties

Structures and properties can be impacted by legacy uranium mining and milling. Elevated levels of radon may be found inside a home and contaminated soil may be found adjacent to a structure. Assessing homes for hazardous substances helps reduce the risk to human health caused by uranium mining.

Public Health

Health impacts from uranium mining and milling activities in the area are assessed by ATSDR or NMDOH through health consultations.

Communicate and coordinate with communities

Community engagement is an important component of the Five-Year Plan. The development of the plan considers the ideas and comments that are provided during the drafting process. Community meetings held at regular intervals on progress under the plan also allow for accountability and transparency. Certain laws, including Superfund, UMTRCA, and state permitting, formally incorporate community involvement throughout the decision-making process.

The activities outlined in the GMD Five-Year Plan are based on current and expected availability of resources and the priorities of the partners of this plan. Resource constraints and re-evaluation of priorities could impact the planned activities.

National Priority List and Superfund Alternative Sites

The sites that are being addressed under the NPL or SA Approach are managed by the EPA Region 6 Superfund Remedial Program. Within Region 6 there are currently three sites related to mining or milling on the NPL and one under the SA Approach program. For detailed site information, including documents and current site status, please visit the site's website. EPA is the lead agency on implementing the Superfund program, with support from state and federal agencies.

Homestake Mill Superfund Site

Map Location: Bluewater and Homestake Mill Figure, Page 9

More Information: <https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0600816>

Note – See also Homestake Mill UMTRCA Site on Page “Homestake Mill Site” on page 36 for a summary of activities under UMTRCA.

Background - The Homestake Mill Superfund site is located in Cibola County, New Mexico, approximately 5.5 miles north of the Village of Milan, at the intersection of Highway 605 and Country Road 631. The site includes the former uranium mill site, two unlined tailing disposal sites (named the large tailing pile and small tailing pile), and the impacted portions of the underlying groundwater aquifers. Uranium milling and tailing disposal operations at the site began in 1958 under a license issued by the Atomic Energy Commission (AEC) and ceased in 1990. The site was placed on the NPL by EPA in 1983, primarily due to groundwater contamination caused by seepage from the two tailing piles. The site is also regulated by the NRC, through its Source Material licensing program pursuant to Title II of UMTRCA, and NMED, through its groundwater discharge permitting program pursuant to the New Mexico Water Quality Act.

The site consists of three operable units (OUs). OU1 addresses tailing seepage contamination to groundwater aquifers; OU2 addresses long-term tailing stabilization, surface reclamation and site closure; and OU3 addresses radon concentrations in indoor and outdoor air at the neighboring subdivisions.



Homestake Mill Site Water Treatment Plant and Evaporation Ponds

The Homestake Mining Company of California (Homestake) started groundwater corrective action for OU1 in 1977 under the direction of the State of New Mexico, which regulated such facilities under an agreement with the AEC. In 1983, EPA entered into a consent decree with Homestake requiring the company to connect residences near the mill to the municipal water supply of Milan, as an alternative permanent drinking water supply, to mitigate the risk caused by consuming contaminated ground water from private wells. In 1986, after the State of New Mexico relinquished its radioactive licensing authority to the NRC, Homestake began performing groundwater corrective actions for OU1 and reclamation and closure activities for OU2 in accordance with NRC Source Material License SUA-1471.

EPA is currently overseeing a Superfund Remedial Investigation and Feasibility Study (RI/FS) being performed by Homestake that will support the selection of a Superfund remedy for OU1 and OU2. The Feasibility Study is being conducted under a 2020 Administrative Settlement Agreement and Order on Consent (ASAOC) with EPA. Under the ASAOC, Homestake is also conducting an evaluation of whether the restoration of groundwater is technically impracticable from an engineering perspective. If it is determined by EPA that it is technically impracticable to achieve a groundwater standard at the site, or a portion of the site, a waiver of the standard would be invoked in the Record of Decision (ROD). The ROD would also identify an alternative remedial strategy for protecting human health and the environment.

Groundwater Protection Standards have been established by the NRC for OU1. In 2006, the standards were revised for uranium, selenium, and other constituents based on a groundwater background study conducted by Homestake. Background concentrations represent naturally occurring concentrations or those caused by other human activity (anthropogenic concentrations) not associated with a site. Therefore, the NRC revised the Groundwater Protection Standards to reflect background concentrations, which were above federal drinking water maximum contaminant levels (MCLs).

In 2014, EPA and NMED began a reassessment of groundwater background concentrations at the request of several residents. The reassessment, which was completed in 2023, led EPA and NMED to conclude that the 2006 background concentrations did not represent natural background but anthropogenic concentrations associated with legacy uranium mining activities north of the site as well as Homestake operations at the site. Natural background concentrations estimated by EPA and NMED are significantly lower than those estimated in the 2006 study. The new background concentrations will support EPA's effort to develop groundwater remediation goals in future EPA decision-making on a Superfund remedy.

Once the FS is completed, EPA will prepare a Proposed Plan that identifies the EPA's preferred cleanup option that will be released to the public. A public meeting and a 30-day public comment period will be held so that the public can submit written comments. EPA plans to issue a ROD for remedies at OU1 and OU2 after the end of the public comment period. EPA will prepare written responses to all comments received on the Proposed Plan during the public comment period.

From 1987 to 1989, Homestake, under an EPA ASAOC, conducted an investigation as to whether radon associated with the uranium milling and tailings disposal operations might be impacting outdoor and indoor radon levels in the neighboring subdivisions (OU3). Based on Homestake's investigation, EPA determined that the uranium mill and tailing piles were not contributing significantly to off-site subdivision radon contamination in air. Instead, EPA attributed the radon contamination mostly to natural background concentrations. Therefore, in 1989, EPA selected "no further action" in a ROD for the radon operable unit (OU3). In the ROD, EPA recommended radon reduction techniques for residents having elevated indoor radon levels.

In 2014, at the request of the community, EPA completed a baseline human health risk assessment for the neighboring subdivisions. The results of the risk assessment indicated that the majority of the risk from radon

gas is coming from background sources, but it also showed that additional incremental risk originates from the site. The site poses a long-term chronic risk (not an immediate risk) that EPA expects will be reduced to background level risk when the final radon barrier cover is placed on top of the large tailing pile and other reclamation work is completed.

Completed and Ongoing Activities

- ◆ June 2020 - A Final RI Report was completed by Homestake for OU1 and OU2 that included a baseline risk assessment.
- ◆ March 2021 - The EPA National Remedy Review Board (NRRB) met with EPA Region 6 and key stakeholders, including the Pueblo of Acoma, NMED, two grassroots organizations (Multicultural Alliance for a Safe Environment and Bluewater Valley Downstream Alliance), and Homestake to discuss the site and hear statements from the stakeholders on expectations for a Superfund remedy. The Pueblo of Laguna submitted written statements.
- ◆ June 2021 - NRRB provided recommendations to EPA Region 6 on the FS process and other aspects of the site, which included expanding the range of cleanup options being considered in the FS for OU1 and OU2. Region 6 responded in October 2021 and generally agreed with all the Board's recommendations.
- ◆ August 2021 – EPA Region 6 and HQs initiated an ambient air modeling study for radon and progeny sourcing from the large tailing pile to verify or update EPA's risk estimates on radon exposure that were documented in the 2014 human health risk assessment report for OU3.
- ◆ September 2021 - A Superfund Five-Year Review (FYR) was completed by EPA to determine if the CERCLA "no further action" decision for off-site radon contamination (OU3), documented in the 1989 ROD, is still an appropriate decision for protecting human health. Based on the review, EPA concluded that additional information was needed to make a protectiveness determination. EPA recommended updating the 2014 human health assessment for radon in the neighboring subdivisions using new toxicity data and the updated EPA electronic calculator for performing radiation risk calculations at Superfund sites. In performing this update, EPA recommended including individual risk calculations for the various lighter radionuclides in the decay chain and using a sum-of-the-fractions approach for calculating total risk from radionuclides in ambient air. The ambient air modeling study initiated by EPA Region 6 and HQs for radon and progeny would support the updated risk assessment.
- ◆ March 2023 - Homestake submitted a revised technical memorandum on the screening of remedial technologies and process options that will comprise a range of remedial alternatives to be evaluated in the final phase of the FS.
- ◆ April 2023 – EPA HQs Superfund Program National Radiation Expert and the Office of Indoor Air Radiation, in working with Region 6 staff, completed an air modeling study for radon and progeny at the site.
- ◆ May 2023 - The Groundwater Background Reassessment Technical Memorandum was completed by EPA and NMED.
- ◆ June 2023 - EPA approved a work plan to characterize the geochemical and physical properties of the groundwater aquifers as part of the ongoing Technical Impracticability evaluation for groundwater restoration.
- ◆ August 2023 – EPA approves Homestake's Addendum to the 2020 Remedial Investigation Report for the baseline human health risk assessment for OU1 and OU2.

Planned Activities for 2024-2028

- ◆ 2024 - Complete site-specific data collection and perform testing to characterize groundwater aquifers in support of the Technical Impracticability evaluation and subsequently, completion of the FS.
- ◆ 2024 - Complete updates to the EPA's 2014 human health risk assessment for OU3.
- ◆ 2025 - Complete the Technical Impracticability evaluation.
- ◆ 2026 - Complete a detailed analysis of remedial alternatives as the second and final phase of Feasibility Study.
- ◆ 2026 - Meet with state and tribal stakeholders to discuss the Proposed Plan and the EPA's preferred remedy and seek state and tribal concurrence.
- ◆ 2026 - Release a Proposed Plan to the public that identifies EPA's preferred Superfund remedy for OU1 and OU2 and hold a formal public meeting to present the preferred remedy and a 30-day public comment period for receiving written comments.
- ◆ 2027 - Issue a ROD that describes the Superfund remedy selected by EPA.

Jackpile-Paguate Uranium Mine

Map Location: Jackpile Mine Area and L-Bar Mill Figure, Page 11

More Information: <https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0607033>

Background - The Jackpile-Paguate Uranium Mine is located on the Pueblo of Laguna adjacent to the Village of Paguate. At the time of operations, the mine was one of the world's largest open pit uranium mines. The mine is located on the eastern edge of the GMD, along the southern margin of the San Juan Basin in Cibola, McKinley, Sandoval, and Bernalillo Counties where numerous natural uranium deposits stretch across the district on private, state, and tribal lands. The former leaseholder, Anaconda Minerals Company, operated the mine from 1953 through 1982. Operations included three open pits and 66 acres of buildings and roads.



Blasting at the Jackpile Mine Site. Date Unknown.

During the 30 years of mining, approximately 400 million tons of low-grade mineralized material or waste rock material were relocated within the leased boundary and approximately 25 million tons of uranium ore were transported to Anaconda's Bluewater Mill for processing via the Santa Fe Railroad from the mine. The releases of hazardous substances to surface water supported the EPA proposed listing onto the NPL on March 15, 2012, for public review and comment and final listing on December 12, 2013. Anaconda performed reclamation activities from the late 1970s to the early 1980s primarily while the mine was still active. Subsequent reclamation activities were performed through 1995 by the Pueblo of Laguna under the auspices of DOI and the DOI ROD.

In July 2017, EPA signed an ASAOC with Atlantic Richfield Company (ARCO), successor to Anaconda Mining, requiring the company to conduct the RI/FS under CERCLA enforcement authority. The remedial investigation will collect data to characterize site conditions, determine the nature and extent of the waste left on site, and will assess the fate and transport of waste left on site in relation to potential risk to human health and the environment. These data will be used to support remedial options and will be documented in the FS for final selection of a Preferred Remedy. The feasibility study will develop, screen, and provide a detailed evaluation of the alternative remedial actions. Once complete, EPA will develop a Proposed Plan identifying the preferred remedy for public review and comment before selecting a final clean-up strategy. The final remedy will be published in an EPA ROD. The proposed plan is not expected to be released during the time covered by this Five-Year Plan.

Completed and Ongoing Activities

- ◆ July 2017 - ARCO began conducting the RI/FS under EPA oversight. EPA will continue the oversight of AR's work under the RI/FS Administrative Order on Consent. It is expected the RI/FS will continue throughout this Five-Year Plan.
- ◆ March 2023 - Phase 1 Supplemental Gamma Radiation Survey was completed to support mid-course evaluations and data gaps to support phase 2 activities.
- ◆ April 2023 – The fourth Phase 1 RI sampling and monitoring event was completed, which included the collection of groundwater, surface water, hyporheic/porewater, and sediment samples for laboratory analysis. These data will be evaluated to support next steps in relation to site characterization across all media.
- ◆ Radiation air monitoring and meteorological data will continue to be collected throughout the RI.

Planned Activities for 2024-2028

- ◆ 2024 - As part of the RI/FS, multi-media quarterly sampling is taking place. Phase 1 Groundwater Sampling and Monitoring, Phase 1 Surface Water Sampling and Monitoring, and Phase 1 Sediment Sampling and Monitoring are expected to be completed.
- ◆ 2025 - Phase 2 will be dependent on determining data gaps from Phase 1.

San Mateo Creek Basin – Central Study Area (Superfund Alternative Site)

Map Location: Ambrosia Lake Figure, Page 7, and Poison Canyon Figure, Page 8

More Information: <https://www.epa.gov/grants-mining-district/san-mateo-creek-basin>

Background – The San Mateo Creek Basin (SMCB) is a 321-square mile drainage basin located north of the Village of Milan and City of Grants, in Cibola and McKinley Counties. It is comprised of private, state, tribal, and federal lands managed by USFS and BLM. Within the SMCB are approximately 85 legacy uranium mines

and four former uranium mill sites. From the late 1950s through the 1990s, this area produced over 40 million tons of uranium ore. Some of the mines in the SMCB were “wet” mines, meaning the uranium ore-bearing geologic formation was saturated. The underground workings of the mines had to be constantly dewatered to allow for access to the ore body. The mine water pumped from the underground workings was discharged to surface drainages and flowed as surface water to the Arroyo del Puerto and San Mateo Creek over a period of decades. The mine-water discharge infiltrated into the alluvial sediments to recharge the shallow alluvial groundwater aquifer. Water levels in alluvial wells were documented to rise over 50 feet in some areas of the basin. The mine-water discharges also recharged bedrock aquifers. It is estimated that approximately 125 billion gallons of mine water was discharged from the “wet” mines, and the mine-water discharges contained elevated concentrations of uranium, selenium, molybdenum, chloride, and other contaminants. The recharge and mixing of the mine-water discharge with native alluvial groundwater and bedrock groundwater resulted in the adverse impact to alluvial and bedrock groundwater quality.

Completed and Ongoing Activities

- ◆ November 2019 – Homestake, Rio Algom Mining Corporation, and the United Nuclear Corporation begin the RI/FS for groundwater in the Central Study Area under EPA oversight.

Planned Activities for 2024-2028

- ◆ EPA will continue to provide oversight of the RI/FS which is expected to be completed after this current Five-Year Plan.
- ◆ 2023: Finalize Phase 1 RI Surface Geophysical Surveys Technical Memorandum, including specifying locations for drilling, coring, and monitoring well installation
- ◆ 2024: Complete drilling/coring and monitoring well installation for approximately 30 alluvial boreholes and 14 bedrock boreholes
- ◆ 2024 - 2026: Conduct groundwater monitoring program and complete laboratory testing of rock core samples

United Nuclear Corp.

Map Location: Grants Mining District, Page 1

More Information: <https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0600819>

Note – See also United Nuclear Mill Site on Page 29 for a summary of activities under UMTRCA.

The United Nuclear Corporation (UNC) Site is located 17 miles northeast of Gallup in Church Rock, McKinley County. The Site includes a former uranium ore processing mill (25 acres) and tailings disposal area (100 acres). The tailings disposal area is subdivided into three cells identified as the South Cell, Central Cell, and North Cell. The surrounding lands include Navajo Nation and UNC-owned property. There are two operable units within the UNC site: the ground water operable unit (OU1) and the surface soil operable unit (OU2). The area is sparsely populated, with the nearest residence located 1.5 miles north of the Site. The land use near the Site is primarily grazing for sheep, cattle, and horses.

Completed and Ongoing Activities

- ◆ Groundwater remediation in OU1 is ongoing in Zone 3 consisting of groundwater pumping and evaporation.
- ◆ December 2018 - The RD to move waste from Northeast Church Rock Mine to the UNC Mill was completed for OU2 and a license amendment request was submitted to NRC.

- ◆ February 2023 – Following NRC completing the Safety Evaluation and Environmental Impact Statement, License Amendment 58 was approved to allow mine waste from the nearby Northeast Church Rock Mine Site on Navajo Nation to be placed on the mill site.
- ◆ September 2023 - EPA completed the Protectiveness Determination and 5-Year Review.

Planned Activities for 2024-2028

- ◆ EPA will continue to provide oversight to UNC's implementation of the groundwater operable unit remedy of pump and treat. The remedy has been optimized since the pump and treat remedy was selected in 1988. The remedy enhancements are meant to buffer, intercept, slow down, direct, and extract impacted ground water. The configuration and pumping scheme of the extraction well array tries to minimize the withdrawal of background water and the tendency to draw it westward while maximizing the volume of impacted water that is extracted.
- ◆ EPA has begun work on the Consent Decree and Statement of Work and will enter negotiations with UNC to implement the remedy.

Assess Water Sources for Contamination

Water is a precious resource in New Mexico because of the arid climate. Most of the drinking water in the state comes from groundwater resources, and residents in the GMD primarily rely on private and community wells for residential-domestic, stock-watering, and agricultural uses.

Legacy uranium mining and milling operations generated liquid wastes, also called effluent. The effluent included groundwater pumped to the surface to dewater mines, process waters from unlined on-site mine ore leach pads, evaporation and tailing ponds, heap- and isotope-leaching, and uranium milling operations. These effluents were discharged to the ground surface or surface drainage features, such as arroyos, and allowed to infiltrate and recharge the shallow alluvium directly or via impoundment infiltration and overflow. From 30 years of mining operations alone it is estimated over 125 billion gallons of mine water was discharged from the subsurface and discharged to surface drainages, the majority being discharged into the SMCB. The effluent discharges that occurred prior to the establishment of state and federal groundwater regulations had little or no treatment prior to discharge.

Groundwater investigations by EPA and other entities have shown the effluent discharged during legacy uranium site operations, as well as subsequent runoff from contaminated soil and sediment which continues to the present, have impacted regional bedrock drinking water aquifers and shallow alluvial aquifers. These aquifers are accessed by scattered private residences and nearby municipal or community water supply systems. Additionally, extensive dewatering of underground workings during mine operations created a regionally extensive cone of depression into which oxygenated groundwater currently is flowing. The oxygenated groundwater may dissolve and mobilize unmined uranium and associated constituents within the aquifers.

Completed and Ongoing Activities

- ◆ Forty-two private wells have been sampled by EPA and NMED.
- ◆ Public water supply wells have been sampled and found to not be impacted by radionuclides.
- ◆ Six private drinking water wells were found to have radionuclides above the maximum contaminant level. EPA conducted removal actions to address the risk caused by the contamination.



Drilling rig being used to install sampling wells.

- ◆ 2016 and 2018 - EPA, with support from NMED, released a Phase 1 Groundwater Investigation Report (2016) and a Phase 2 Groundwater Investigation Report (2018). Those two reports documented contamination of portions of the shallow alluvial and deeper bedrock aquifers in portions of the San Mateo Creek Basin. Information from these reports will help inform regulatory agencies in future decision-making.
- ◆ November 2019 - Under EPA oversight, three potentially responsible parties began the RI/FS of the SMCB Central Study Area.

Planned Activities for 2024-2028

- ◆ NMED will continue to partner with DOE on sampling private wells in the Homestake Mill Site and Bluewater Mill Site vicinity.
- ◆ NMED and DOE will collaborate to plan and develop enhanced off-site well network to further understand and characterize groundwater dynamics and conditions at the Bluewater site.
- ◆ EPA will continue to provide oversight for multiple studies being conducted under ASAOs that include groundwater monitoring.

Assessment and Cleanup of Abandoned Uranium Mines

CERCLA Site Assessment of Priority Mines

Lead Agency – EPA

Support Agencies – NMED, MMD, and Pueblos

Under the Superfund process, site assessment is the initial step most non-emergencies take in determining whether a site needs further action. The site assessment process begins with site discovery or notification of a release or potential release into the environment. Following discovery/notification, sites undergo Pre-CERCLA Screening to determine whether a site needs further assessment. A Pre-CERCLA Screen is an initial collection and review of existing information and helps determine whether the site should be evaluated under the Superfund program or under another federal, state, or tribal cleanup program.

EPA, or its state or tribal partners may conduct a preliminary assessment, and if warranted, a site inspection or other more in-depth assessment using the Hazard Ranking System criteria. A site reassessment may also be performed to gather and evaluate new information at a site. At any step in the site assessment process a No Further Remedial Action Planned determination can be made.

Working with the state and Pueblo partners, EPA identified 97 priority mines within the GMD. The threshold for becoming a priority mine is: mine activities included surface expressions, such as an open pit, mine shaft, or mine structures; and Reported at least two years of production.

Mines not identified as a priority mine do not preclude EPA from assessing them but help prioritize limited resources on the sites most likely to impact human health and the environment.

Completed and Ongoing Activities

- ◆ October 2009 and August 2011 - EPA conducted aerial gamma radiation surveys. Data collected helped EPA and its partners identify areas needing additional assessment. No health-based decisions are made using this screening tool.
- ◆ EPA funded initial screenings assessments by NMED and MMD at 59 mines on private or tribal land.

Planned Activities for 2024-2028

- ◆ 2024 - Complete Pre-CERCLA screens and decision documents.
- ◆ Continued communications/coordination with Federal, State and Tribal partners on assessment, and where warranted, cleanup of AUMs.
- ◆ Support the DOE DRUM Verification & Validation Program with coordination with Pueblos on the assessment of mine sites.

DOE Defense Related Uranium Mines Verify & Validate Program

More Information: <https://www.energy.gov/lm/defense-related-uranium-mines-program>

Lead Agency: DOE

Support Agencies: EPA, BLM, USFS, and National Park Service, New Mexico, and Pueblo of Laguna

The DOE Defense-Related Uranium Mines (DRUM) program is a partnership between DOE, federal land management agencies, EPA, state abandoned mine lands (AML) programs, and tribal governments to verify and validate the condition of a unique set of abandoned uranium mines. These mines provided uranium ore to the AEC for defense-related activities.

Most mines are located on public land and are abandoned. Initiated in 2017, DRUM Campaign 1 focused on approximately 2,500 legacy mines located on public land administered by federal and state agencies. Campaign 2 commenced fieldwork in 2022 and assessed DRUM sites on tribal land. Campaign 3 will assess DRUM sites on private property and is scheduled to begin fieldwork in 2024. The DOE Office of Legacy Management implements the program by conducting verification and validation (V&V) activities, including:

- ◆ Exchanging information with other federal agencies and state governments to improve the quality of mine-specific data.
- ◆ Performing field inventories to document the condition of the mines.
- ◆ Conducting gamma surveys, soil sampling, and water sampling (as applicable), as well as collecting multiple lines of evidence to help evaluate hazards posed by the mines.
- ◆ Producing mine-specific reports that offer inventory results, as well as evaluations of physical hazards and potential chemical and radiological risks.



V&V assessment work at the Crackpot Mine on Pueblo of Laguna.

Ultimately, these V&V activities will result in preliminary risk screening to assess whether the mines pose potential risks to human health and the environment. This information will be shared with the BLM, U.S. Forest Service, and state and tribal governments to help them make decisions about how to address mines that pose the greatest risks.

Completed and Ongoing Activities

- ◆ October 2023 - Completed 55 V&V Reports for mines located on federally managed land within New Mexico, including mixed ownership where a portion of the mine site is on federal public land. Of the 55 V&V reports, 38 of those are on BLM including mixed ownership sites where there is a portion on BLM land.
- ◆ October 2021 - Secured funding to support implementation of Campaign 2 on pueblo/tribal land and began coordination with EPA and the Pueblo of Laguna for mines located on the Pueblo. DOE will defer

the Jackpile Mine and its related mines to EPA because the mine site is final on the NPL.

- ◆ June 2022 - DOE transitioned to Campaign 2 and worked with EPA, along with affected pueblos/tribes. In spring 2022 revised the DRUM work plan and risk screening process, adopted risk scenarios and table values beneficial to future management decisions by tribes.

Planned Objectives for 2024-2028

- ◆ 2024 - DOE will transition to Campaign 3 field work. Campaign 3 is aimed toward assessing DRUM sites on private property and fieldwork is scheduled to begin in 2024.
- ◆ DOE will work collaboratively to V&V and safeguard hazardous mine openings and will secure the funding to perform V&V and safeguarding as required for these AUM sites.

BLM Defense Related Uranium Mines Verify & Validate Program

Lead Agency: BLM

Support Agency: DOE

BLM has worked closely with DOE's DRUM Program on AUMs located on BLM-managed land since 2013. BLM and DOE entered in a memorandum-of-understanding that provides a framework for the partnership and identifies roles and responsibilities to support the on-the-ground verification and validation efforts at DRUM sites.

Completed and Ongoing Activities

- ◆ February 2020 - Reviewed 32 V&V Reports received from DOE DRUM Program. Review consisted of evaluating site characteristics, contamination profile, human health, ecological impacts, ground water and surface water, background concentrations, offsite migration potential, and physical safety dangers to develop a plan of action for each site as needed.
- ◆ 2021 - BLM completed the closure of 17 mine openings that were physical hazards. Closure of the openings included the use of bat-compatible doors to prevent human entry into mine features, plugging and backfilling boreholes, and filling in subsidence's.
- ◆ 2023/2024 – Enlisted contractor to evaluate all V&V Reports to develop a conceptual cost estimate for remediation of each site.

Planned Objectives for 2024-2028

- ◆ BLM will continue to implement safe-guarding physical hazard measures at mine sites where open shafts, vent holes, and other physical hazards were identified in the V&V Reports. In New Mexico, BLM expects to address 30 safe-guarding measures in the coming years.

New Mexico Uranium Mine and Mill Reclamation Initiative – House Bill 164

Lead Agency – NMED

Support Agency – EMNRD-MMD

New Mexico House Bill 164 was passed in 2022 that required both NMED and MMD to coordinate efforts across the State of New Mexico to clean up and reclaim former uranium mine and mill sites. HB164 requires NMED to 1) develop a strategic plan across 12 state agencies to promote, coordinate, or conduct uranium

clean up at formerly-operating mine and mill sites, 2) conduct effective mechanisms for consultation and coordination between the federal government, Indian nations, tribes, pueblos, communities impacted by uranium mining, and other states, 3) work with the economic development department, workforce solutions department and industry to develop and/or support the uranium mine and mill reclamation workforce in New Mexico, 4) develop, maintain and update a centralized data repository, and 5) report annually to the Radioactive and Hazardous Materials Committee on reclamation activities undertaken by all state agencies associated with the bill.

HB164 also created a uranium mining reclamation revolving fund for conducting uranium mine and mill reclamation activities, and in so doing authorized the State of New Mexico to address *neglected* uranium mine sites that remain under no federal, state, tribal, or other cleanup program.

Completed and Ongoing Activities

- ◆ 2023- NMED is drafting a Strategic Plan to take a comprehensive approach in addressing uranium cleanup across state agencies, with an expected finalization in 2024.
- ◆ 2023 – Development of an interactive web mapping tool, a *Formerly-Operating Uranium Mine and Mill Sites Dashboard*, to provide the public with information and site cleanup statuses.
- ◆ 2023-Development of framework for the economic development department and workforce solutions department to support a uranium reclamation workforce in New Mexico.

Planned Objectives for 2024-2028

- ◆ 2024 – Continuous updates to the *Formerly-Operating Uranium Mine and Mill Reclamation Dashboard*.
- ◆ 2024 – Development of a regulatory framework to address neglected AUMs (sites that are under no federal, state, tribal, or other cleanup program).
- ◆ 2024 - Ongoing identification of Potentially Responsible Parties associated with neglected AUMs.
- ◆ 2024 – Development of a job training pilot program with multi-lateral support from government, industry, and higher education entities.

Ambrosia Lake Sub-District Mines

Map Location: Ambrosia Lake Figure, Page 7

Lead Agency – EPA, NMED, and MMD

The Ambrosia Lake Sub-District is located within the SMCB and is approximately 18 miles north of Grants, Cibola County, New Mexico and north of the intersection of New Mexico State Highways 509 and 605. Within the Ambrosia Lake Sub-District are 27 priority mines. Some of these mines were “wet mines” that required constant pumping and discharge of mine-impacted groundwater to access the ore body. Other mines were “dry mines” and had no groundwater discharges. A subset of the Ambrosia Lake Sub-District mines are the eleven Tronox NAUM Mine sites (See page 34 for information specific to the Tronox mines).

Completed and Ongoing Activities

- ◆ September 2021 – Entered into an ASAOC with Homestake to complete Removal Site Evaluations (RSEs) with EPA oversight at eight mines. The mines are Dysart #1, Dysart #2, Dysart #3, Section 13, Section 15, Section 23, Section 25, and Section 32. The RSEs will determine surface soil radioactive contamination and the exposure risk to human health and the environment. The data generated during the RSEs will be used to aid in cleanup decisions, including if an Engineering Evaluation/Cost Analysis (EE/CA) is necessary. An EE/CA identifies the objectives of the removal action and analyzes the

effectiveness, implementability, and cost of various alternatives that may satisfy these objectives. The EE/CA also identifies the preferred alternative based on the analysis.

Planned Objectives for 2024-2028

- ◆ 2024 – Homestake will complete the RSEs for the eight mines. EPA will evaluate the RSEs and determine if an EE/CA is necessary to develop potential cleanup alternatives to address risk to human health. Any EE/CAs for one or more of the eight mines will be released for a 30-day public comment period prior to selection of the non-time-critical removal action.

J.J. #1 Mine

Map Location: Jackpile Mine Area and L-Bar Mill Figure, Page 11

Lead Agency – MMD and NMED

The J.J. #1 Mine operated as a wet mine with production from 1976 through 1981. It is located near the L-Bar Uranium Mill northeast of the Pueblo of Laguna, on the Cebolleta Land Grant. Initial reclamation was undertaken in the late 1980s with waste rock located near the main shaft transported to the mill tailing area during the decommissioning of the L-Bar Uranium Mill.

The site has been under groundwater abatement with NMED since 2005. Constituents exceeding New Mexico groundwater standards include uranium, fluoride, total dissolved solids, and sulfate. Further reclamation of the mine site was initiated in 2009, under permit with the NM Mining Act. The site is now a candidate for release under the Mining Act after the regulatory 12-year monitoring of the site.

Completed and Ongoing Activities

- ◆ June 2011 - Surface reclamation of the site was completed by Sohio Western Mining Company. Boreholes and staging areas were sealed, fenced, covered, and revegetated.
- ◆ 2017-2022 - Submission and approval of Stage 1 abatement plans, and associated documents, as required under 20.6.2.4106 NMAC. NMED has reviewed all submitted documents and is working with Sohio on the Stage 2 abatement process where a final remedy for groundwater protection will be determined.
- ◆ Ongoing - Groundwater monitoring reports submitted to NMED.

Planned Activities for 2024-2028

- ◆ 2023-2024 - NMED will initiate the Stage 2 process with Sohio and reach an agreement on a final remedy to ensure long-term groundwater protection.
- ◆ 2025 - MMD is waiting for the operator, Sohio, to complete erosion repairs and revegetation of the site. The site is a candidate of release under the NM Mining Act.
- ◆ Groundwater monitoring reports submitted to NMED to verify if the approved remedy is effective.

Johnny M Mine Site

Map Location: Upper San Mateo Creek
Study Area Figure, Page 10

Lead Agency – EPA

The Johnny M Mine Site is an abandoned uranium mine located in the northeastern area of the SMCB, approximately 4.5 miles west of the Village of San Mateo. Development of the mine began in 1972 and production of ore began in 1976, ending in 1982. The mine consisted of an underground mining operation which utilized surface support facilities, including two mill tailings fill storage areas, two discharge ponds, a ditch with a water discharge pipe routed to a nearby drainage, a water supply well used to support mining operations, and an access road easement.

The operation consisted only of ore removal; no milling occurred on-site. The mine operated as a “wet” mine; mine process water had to be pumped out of the mine workings in order to access the ore and was discharged to the surface, entering a series of existing arroyos on the southern and central portions of the Site, or through a discharge piping system that transported treated shaft water off the Site. Historical site operations left concentrations above health-based levels of radionuclides and their associated progeny in various on-site waste streams, including uranium mine/uranium mill waste, pond and surface drainage sediments, soil, and debris.



Johnny M Mine Site

Completed and Ongoing Activities

- ◆ March 2011 – EPA initiated a time-critical removal action due to a private residence and ranching business located on the former ore stockpile area. This necessitated a temporary relocation of the resident that ended when an entity related to Hecla Mining, successor to Ranchers Exploration and Development, acquired the property.
- ◆ August 2017 – EPA completed the RSE that covered impacted areas from the mine site. The RSEs investigated surface soil radioactive contamination and determined the exposure risk to human health and the environment. The data generated during the RSE was used to assist in cleanup decisions at the sites through completion of EE/CA as part of a Non-Time Critical Removal Action.
- ◆ 2019 - Hecla Mining’s development of a draft Engineering Evaluation/Cost Analysis was completed. The draft EE/CA was an initial step for EPA to begin consideration of cleanup alternatives and selecting a preferred alternative for public comment.
- ◆ October 2019 - EPA released the EE/CA to the public and conducted a public comment period, which

included a public availability session. The EE/CA identified consolidation of surface mine waste above health-based cleanup levels from across the Site into an on-site repository as the preferred alternative.

Planned Activities for 2024-2028

- ◆ 2024 - Complete negotiations with the responsible parties to implement the Non-Time Critical Removal Action with EPA oversight.
- ◆ 2024 - 2025 - Complete design work for the waste repository and initiate and complete the removal action for the surface mine waste.
- ◆ 2024 – 2025 - Initiate post-removal action Operations & Maintenance of the site.

Mt. Taylor Mine

Map Location: Upper San Mateo Creek Study Area
Figure, Page 10

Lead Agency – NMED and MMD

Support Agency - USFS

The Mt. Taylor Mine is a former uranium mine located directly east of the San Mateo Village and lies on the northwestern edges of Mt. Taylor. Development of the main shaft that reached over 3,000 feet began in 1975 and production started in 1980. The mine ceased production in 1990 and went on stand-by for nearly two decades. In 2017, the current mine owner, Rio Grande Resources, applied to reopen the mine but announced in December 2019 their intent to close the mine. The mine is currently undergoing Cleanup and Closure under New Mexico state regulations. A revised Closure/Closeout Plan (CCP) was submitted by Rio Grande Resources in June 2022 to both MMD and NMED. The CCP will address requirements under the NM Mining Act and NM Water Quality Act. The USFS administered a special-use permit for the treated water discharge pipeline. The site is currently covered with a financial assurance of \$7.6 Million. Discharges associated with the Mt. Taylor Mine are regulated in accordance with groundwater Discharge Permit DP-61 and impacts to groundwater are addressed pursuant to the approved Stage 1 and Stage 2 groundwater Abatement Plans. Surface reclamation of the Mt. Taylor Mine is addressed under the Mining Act Permit No. CI002RE.



Head frame at Mt. Taylor before demolition

Completed and Ongoing Activities

- ◆ May 2020 – Rio Grande Resources began closeout and reclamation activities pursuant to state permits. Activities have included:
 - Removal of approximately 65,000 tons of low-grade ore to the White Mesa Mill in Blanding, Utah for processing as mill feed stock.
 - Removal of radiologically contaminated sediments from 8 water treatment ponds and depositing

them in an on-site lined disposal cell, and reclamation grading of the treatment pond area.

- Demolition of mine site facilities and buildings including a mine water treatment system, and head frames.
- Demolition of treated water discharge pipeline in coordination with the USFS that crosses National Forest System lands.
- Near surface plugging and surface capping of the 14-ft. and 24-ft. diameter shafts.
- Construction of stormwater pond and implementation of Best Management Practices at the site to prevent off-site discharges of stormwater. Construction of a lined pond for contaminated water.

- ◆ Continuation of groundwater monitoring pursuant to both DP-61 and the abatement plan.

Planned Activities for 2024-2028

- ◆ 2024 – The State agencies will be processing the update to the operator’s Closure/Closeout Plan. This process will likely take about a year to complete. In the meantime, the operator will continue to conduct reclamation activities, moving toward complete closure/reclamation of the site.
- ◆ 2024 - NMED will work towards renewal of DP-61.

St. Anthony Mine

Map Location: Jackpile Mine Area and L-Bar Mill Figure, Page 11

Lead Agency – NMED and MMD

The St Anthony Mine is located on the Cebolleta Land Grant and was operated by UNC from 1975 to 1981. Two open pits, multiple waste rock piles and an underground mine shaft were used during mining operations. St Anthony completed the NMED groundwater abatement process (Stage 1 and Stage 2) with the establishment of Alternative Abatement Standards in 2017. In January 2006, UNC submitted a site CCP as required under state regulations with NMED and MMD. The 2006 CCP was never approved due to technical deficiencies. A 2019 submitted CCP was not in alignment with the approvals granted by NMED in the abatement process. The State Agencies have been in communication with St Anthony since 2019 to determine a path forward with the submitted plan that deviates from previously approved designs. UNC informally communicated with the



St. Anthony Mine

Agencies that the previously approved abatement remedy will not be protective of groundwater due to some new modeling results. The Agencies requested UNC submit a modification to the Stage 2 abatement plan with a revised CCP that addressed sitewide closure/closeout. The Agencies received this document in October 2022 and are in the process of reviewing and commenting on the new proposed plan.

Completed and Ongoing Activities

- ◆ Numerous technical feasibility studies have been completed; however, no reclamation has occurred at the site at this time. The operator must obtain an approved CCP before reclamation can commence. Interim financial assurance consisting of a \$25,000,000 surety bond and a \$71,000,000 letter of credit are in place.
- ◆ October 2022 - UNC submitted a Stage 2 abatement plan modification and a 30% reclamation design CCP. The public participation process under MMD and NMED is complete at this time, with additional public engagement scheduled per the rules governing each agency.
- ◆ May 2023 – MMD and NMED submitted first round of comments on the CCP.
- ◆ August 2023 – UNC submitted response to the agencies first round of comments on the CCP.
- ◆ Ongoing - Groundwater monitoring reports submitted to NMED.

Planned Activities for 2024-2028

- ◆ Continued negotiations between UNC and the State Agencies are expected regarding the content of the revised CCP and modification of the Stage 2 Abatement Plan.
- ◆ State Agency review of the CCP during 2023 with possible approval in 2024 depending on the amount of technical review required. Potential public hearings with NMED and MMD on the CCP and modified Stage 2 abatement plan.
- ◆ Groundwater monitoring reports will continue to be submitted to NMED, and reclamation reports submitted to both agencies once the work on site begins.

Section 12 Mine

Map Location: Ambrosia Lake Figure, Page 7

Lead Agency - MMD

The Section 12 Mine is an abandoned uranium mine located in Ambrosia Lake approximately 20 miles North of the village of Milan, NM in McKinley County New Mexico. This is an underground mine that was operated by Southwest Resources Inc. in 1959, 1962, and 1974-1982.

Currently this site is under full reclamation through a Director's Order on Consent issued by the State of NM Mining and Minerals Division on December 16, 2019. NMED is involved as a consulting agency on this site; there are no discharge permits or abatement plans.



Section 12 Head Frame

Completed and Ongoing Activities

- ◆ December 2019 - MMD issued a Director's Order on Consent to start reclamation activities.
- ◆ November 2020 - MMD gave a conditional approval of final Reclamation Plan.
- ◆ July 2021 - The trustee for Southwest Resources began implementation of the reclamation plan. Reclamation activities onsite have been limited to the removal of structures such as the hoist and hoist house and resin waste left on the site. Two vent shafts have been fitted with bat cupulas. No work on the shaft or earthwork has been started on site and currently MMD and Empire Trust are engaged in Legal Conversations regarding funds left in the Trust and how much reclamation can feasibly be done. It is anticipated that Empire Trust will exhaust all funds before reclamation is complete.

Planned Activities for 2024 – 2028

- ◆ 2025 - Reclamation will be completed, including removal of head frame and other physical structures, and plugging of shafts and vents. This is contingent on available funds left in the Trust and legal negotiations between MMD and Empire Trust
- ◆ 2025 - Long-term monitoring will commence following completion of the reclamation.

Section 27 Mine

Map Location: Ambrosia Lake Figure, Page 7

Lead Agency – NMED and MMD

The Section 27 mine is in Section 27, Township 14N, Range 9W approximately 35 miles north of Grants, New Mexico and approximately two miles east of the Ambrosia Lake Mill in the Ambrosia Lake District of McKinley County. UNC produced uranium ore from the Section 27 mine during operations from 1970 to 1977. The Section 27 mineral lease covered approximately 200 acres in the southern half of Section 27 and was surrendered in 1988. Prior to mine closeout construction conducted in 2010, features at the site included two shafts, three vent holes, two small piles of non-economic mine materials containing overburden rock, sands, and gravels, one small ore stockpile, two topsoil stockpiles and several small piles of ball mill reject materials. The mine site is currently inactive, and the mining features encompass approximately 14 acres. NMED initiated the abatement process in 2002 due to groundwater exceedances of multiple constituents at the site.

Completed and Ongoing Activities

- ◆ 2010 – NMED conditionally approved the Stage 1 Abatement Plan and activities under the plan began. These activities included consolidation of the materials into two areas, capping vents and shafts, and revegetation.
- ◆ 2015 - NMED approved a request from UNC to reduce the constituents analyzed in accordance with the approved groundwater monitoring plan.
- ◆ 2019 – UNC's annual groundwater monitoring report stated regular groundwater monitoring would be ceased. NMED responded that groundwater monitoring shall continue.
- ◆ 2022 – NMED and MMD initiated communications for work to resume under abatement and final site reclamation.
- ◆ 2023 – NMED and MMD is currently working with UNC to revise Permit No. MK005RE to update the Closeout Plan.
- ◆ 2023 - 2024 – UNC shall continue the Stage 2 abatement process with NMED.

Planned Activities for 2024-2028

- ◆ 2026 - Gamma radiation exposure rate surveys in 2011 (with soil sampling for Ra-226 correlation) showed residual contamination levels above target rates inside the permit boundary and outside the permit boundary. Additional removal and placement of the contaminated material into a new consolidation area should be performed, followed by grading, and covering the consolidation area with a 3-foot-thick layer of cover material from the borrow area and revegetation. The additional clean-up will be in accordance with the Joint Guidance for the Cleanup and Reclamation of Existing Uranium Mining Operations in New Mexico, EMNRD and NMED, March 2016.

Tronox Navajo Area Uranium Mines

Map Location: Ambrosia Lake Figure, Page 7

Lead Agency – EPA

The Tronox Navajo Area Uranium Mines (Tronox NAUMs) are located primarily in the Grants Mining District in New Mexico and in the Northern and Eastern Regions of the Navajo Nation. The Tronox Settlement provided over \$900 million to assess and clean up 54 Tronox NAUMs; 20 of the mines are within Region 6. Six of the twenty mines in Region 6 did not have their own mine shaft, instead using the shaft of neighboring mines to bring ore to the surface. These six mine sites will be addressed through actions at the mines where the shaft was used, leaving 14 mines that need to be addressed.

One of the 14 mines, Spencer Mine, was reclaimed in 2015 by MMD's Abandoned Mine Lands Program through funding provided by BLM.

One of the 14 mines, Section 33, has waste commingled with the EPA Region 9 Section 32 mine located on Navajo Allotment Land. Due to the commingling of the mine waste, Region 9 will be the lead at the site.

Section 10 Mine is a stand-alone site. This leaves 11 mine sites identified in the Tronox Settlement which Region 6 divided into geographic sub-areas (GSAs) to manage field work. The areas are:

East GSA	Central GSA	West GSA
Section 35	Section 17	Section 22
Section 36	Section 19	Section 22 Heap Leach
	Section 30	Section 24
	Section 33	Section 24 Heap Leach
		Section 30 West

Completed and Ongoing Activities

- ◆ 2015 – MMD, utilizing funding from BLM, completed reclamation of the Spencer Mine.
- ◆ September 2019 - Completion of RSEs that covered impacted areas from Section 10, Section 33, and the three Tronox GSAs. The RSEs investigated surface soil radioactive contamination and determined the exposure risk to human health and the environment. The data generated during the RSE is used to assist in cleanup decisions at the sites through completion of EE/CAs as part of a Non-Time Critical Removal Action.
- ◆ 2020 - Completion of Alternative Analysis Memos (AAMs) for Section 10 and the three Tronox GSAs. The AAMs used data collected during the RSEs to identify potential cleanup alternatives. The AAMs were then shared with regulatory partners (New Mexico Environment Department, New Mexico Mining

and Minerals Division, Navajo Nation EPA, and Navajo Nation DOJ). Technical discussions were offered, followed by an opportunity to comment on the cleanup alternatives being considered.

- ◆ December 2021 - EPA completed the Tronox NAUM Allocation Strategy. The strategy allowed for the transfer of \$305 million to the Region 6 Tronox Special Accounts to be used to support assessment and cleanup actions. Based on current estimates, this funding is not adequate to complete response actions at all the Region 6 sites, but will be used for intramural and extramural costs, and may provide incentives for responsible parties to enter settlements to do the work pursuant to EPA settlement guidance.
- ◆ May 2023 – EPA released the EE/CA for the Tronox Section 10 mine for a 30-day public comment period. EPA extended the comment period an additional 30 days at the request of several entities. EPA is evaluating the comments received.

Planned Activities for 2024-2028

- ◆ 2024 - Complete EPA's internal reviews of the three Tronox GSA draft EE/CAs. These internal reviews help ensure consistency across regions and ensure technical guidance and policy is implemented appropriately.
- ◆ 2024 – Finalize EE/CAs that cover the three Tronox GSAs.
- ◆ 2024 - Release the three Tronox GSA EE/CAs for public comment. Community involvement is an important piece to the Superfund process, affording impacted communities and other interested stakeholders an opportunity to play a role in the decision-making process. EPA will release EE/CAs for public comment and hold, at a minimum, a 30-day public comment period to receive comments on the document and the preferred alternative. During this public comment period, an availability session will be held to answer questions members of the community may have.
- ◆ Continue to implement EPA's Enforcement First Policy. EPA will continue to pursue liable and viable PRPs and negotiate or order enforcement instruments that will require potentially responsible parties (PRPs) connected with the Tronox NAUMs to conduct the cleanups.
- ◆ Implement non-time critical removal actions. It is expected PRPs will conduct the non-time critical removal actions under enforcement instruments. EPA expects removal actions will continue past the current period covered by this Five-Year Plan because of the volume of waste to be addressed.

Assessment, Cleanup, and Long-Term Management of Former Uranium Milling Sites

Uranium mills took the mined uranium ore and used various chemicals to extract the uranium and create yellowcake. Along with yellowcake, the process also creates mill tailings that contain radium and metals. The processes used to create the yellowcake and the remaining mill tailings can impact human health.

Ambrosia Lake Disposal Site (Phillips Mill)

Map Location: Ambrosia Lake Figure, Page 7

More Information: <https://www.energy.gov/lm/ambrosia-lake-new-mexico-disposal-site>

The Ambrosia Lake disposal site is a former uranium-ore processing facility in McKinley County, approximately 25 miles north of Grants, New Mexico. The former mill processed more than 3 million tons of uranium ore between 1958 and 1963 and provided uranium for U.S. government national defense programs. Phillips Petroleum Company built the original mill at the site in 1957 to process ore from nearby mines. United Nuclear Corporation purchased and operated the mill for a brief period in 1963, then ceased milling operations but retained ownership of the site.

From the late 1970s to early 1980s, United Nuclear Corporation operated an ion exchange system, extracting uranium from mine water. All mill operations ceased in 1982, leaving radioactive mill tailings, a predominantly sandy material, on approximately 111 acres. Wind and water erosion spread some of the tailings across a 230-acre area. Under Title I of UMTRCA, DOE remediated the site and local contaminated vicinity properties

between 1987 and 1995. Surface remediation consisted of consolidating and encapsulating all contaminated material onsite in an engineered disposal cell.

Completed and Ongoing Activities

- ◆ 2019, 2020, 2021, 2022, 2023- Annual site inspection and reporting
- ◆ 2022, 2023 – Annual Engineering evaluation of observed erosion features for potential intervention (first one completed in 2022)
- ◆ 2022 – Baseline aerial survey conducted. No anomalies were identified or detected in the data gathered.



Former Kerr-McGee Uranium Mill Site

- ◆ 2019, 2022 – Triennial groundwater sampling was completed. Analysis and results are available on Geospatial Environmental Mapping System.

Planned Activities for 2024 – 2028

- ◆ 2024 - Pollinator study scheduled which will contribute to ongoing pollinator initiative efforts.
- ◆ 2025, 2028 - Triennial groundwater sampling scheduled.
- ◆ 2024, 2025, 2026, 2027, 2028 - Annual site inspections and reporting.
- ◆ 2024, 2025, 2026, 2027, 2028 - Annual Engineering evaluation of observed erosion features for potential intervention.

Ambrosia Lake - West Mill Site (Rio Algom Mill)

Map Location: Ambrosia Lake Figure, Page 7

More Information: <https://www.nrc.gov/info-finder/decommissioning/uranium/rio-algom-ambrosia-lake.html>

Lead Agency: NRC

The Rio Algom Ambrosia Lake Mill Site, also known as the Ambrosia Lake West Site (the facility) is a uranium mill tailings site in the Ambrosia Lake uranium district of New Mexico. It is located approximately 25 miles north of Grants, New Mexico. The mill was built by the Kermac Nuclear Fuels Corporation in 1957 and historically consisted of the mill site, uranium mill tailings ponds, and associated outlying evaporation ponds. The mill began processing uranium ore in 1958 and was placed in standby status by 1985. The tailings impoundment at the facility contains 33 million tons of mill tailings and covers an area of approximately 370 acres.

The site was acquired by Rio Algom Mining, LLC (RAML) in 2001. The site status changed from standby status to reclamation status in August 2003 to reflect RAML's intent to begin full demolition and reclamation of the site leading to termination of the license. The mill was demolished and disposed of in the tailings impoundment in late 2003. The demolition was completed in accordance with a mill demolition plan approved by NRC in 2004. Uranium mill tailings generated during the Facility's operational period were disposed within the footprint of historical ponds 1 and 2. Disposal cell 1, which overlies historical pond 1, was completed in 1998, and contains approximately 30 million tons of uranium mill tailings covering 260 acres. Disposal cell 2, which overlies historical pond 2, was completed in 2016 and contains approximately 3 million tons of uranium mill tailings covering 90 acres. Additionally, soil affected by windblown uranium mill tailings is expected to be placed into another, yet to be submitted, disposal cell.

Areas surrounding the disposal cells, possibly including land adjacent to the former Ambrosia Lake West mill, have been affected by windblown tailings. Windblown remedial work has been performed intermittently since 2003 and is on-going. The remedy for windblown-affected areas consists of excavation and disposal of affected soil in a disposal cell, the design of which has not yet been submitted to NRC.

The NRC approved a groundwater corrective action program for the Ambrosia Lake West mill in 1989. In 2000, RAML submitted alternate concentration limit (ACL) petitions for the Facility's alluvial and uppermost bedrock units to NRC. Following approval of the Facility's ACLs in February of 2006, RAML ceased its groundwater corrective action program and began a groundwater stability monitoring program, which is on-going. Field work based on a 2017 workplan that would support a future supplemental ACL request is ongoing. NMED has four discharge permits for the RAML mill and associated mine sites. The site is currently in Stage 1 abatement. NMED and MMD currently hold joint financial assurance and an interim closure plan for reclamation activities not addressed by the other regulatory agencies involved in the site.

Completed and Ongoing Activities

- ◆ 2017 – RAML terminated the site environmental monitoring program, with the exception of radon monitoring.
- ◆ January 2019 - Final status surveys following the 5-point soil sampling grid approach laid out in the 2006 Soil Decommissioning Plan did not meet the required criteria. RAML and NRC held a public meeting on January 23, 2019. RAML proposed an alternative approach based on a Rank Set Sampling method to meet the criteria.
- ◆ 2020 - License amendment request by Rio Algom was submitted to update license conditions to reflect current site conditions and operations.
- ◆ 2023 - License amendment was completed to update the radiation protection and environmental monitoring program manual, incorporate performance-based licensing, replace two degraded monitoring wells, and add a license condition to characterize detected COCs at one of the monitoring well replacement locations.
- ◆ Annually - The Rio Algom annual surety is updated by license amendment.
- ◆ Annually - NRC Region IV inspects the Ambrosia Lake West site.

Planned Activities for 2024 – 2028

- ◆ NRC staff expects to complete its review of the Rio Algom’s January 31, 2023 submittal entitled, “Summary of Select Historical Uranium Recovery Processes at In-scope Mines in the Ambrosia Lake Valley.” Staff’s review will determine which potential commingled mill/mine areas described in the report are covered under NRC’s license for the Ambrosia Lake West site.
- ◆ NRC staff expects that Rio Algom will characterize the vertical extent of sediment with elevated COCs beneath the former ponds within the Ponds 4 area and submit the results to NRC for review. Staff also anticipates Rio Algom may potentially request a license amendment for the unrestricted or restricted release of the Ponds 4 area at the Ambrosia Lake west site.
- ◆ NRC staff expects to receive a license amendment request to update the soil decommissioning plan with areas and activities for the removal of surface sediments containing licensed material.
- ◆ NRC staff expects to receive a license amendment request for the planned construction of a fourth disposal cell.
- ◆ NRC staff expects to receive Rio Algom’s construction completion report for the fourth disposal cell.
- ◆ 2026 – Completion of NMED discharge permit renewal and updates for the site and move the site into State 2 abatement.

Bluewater Disposal Site

Map Location: Bluewater and Homestake Mills Figure, Page 9

More Information: <https://www.energy.gov/lm/bluewater-new-mexico-disposal-site>

The Bluewater disposal site is in Cibola County, approximately 9 miles northwest of Grants, New Mexico. Anaconda Copper Company constructed the original carbon-leach mill at the site in 1953 to process limestone uranium ore mined in the vicinity of the site. An acid-leach mill was constructed in 1957 to process sandstone uranium ore from the Jackpile-Paguate mine, the largest open-pit uranium mine in North America, located north of Laguna Pueblo. The carbon-leach mill closed in 1959. Milling operations at the site ended on February 14, 1982. Uranium ore processing at the Bluewater mill produced radioactive tailings, a predominantly sandy

material. The tailings were conveyed in slurry from the mill to two locations and the process water in the tailings slurry seeped into the underlying alluvial and bedrock (San Andres Glorieta) aquifers and contaminated the groundwater. Atlantic Richfield Company (ARCO), who acquired the original operator, Anaconda Copper Company, began decommissioning the mill in 1989 and began site reclamation in 1991. By 1995, all mill tailings, contaminated soils, demolished mill structures, and contaminated vicinity property materials were encapsulated in on-site disposal areas. The site was included under the NRC general license for UMTRCA Title II and transferred from ARCO to DOE for long-term custody in 1997.

Completed and Ongoing Activities

- ◆ March 2019 - to mitigate risk associated with depressions forming on the top slope of the Main Tailings Disposal cell, DOE engaged the U.S. Army Corps of Engineers (USACE) to complete a design and construction to repair these depressions and address water ponding issues. USACE completed an Aerial survey of the Main Tailings Pile in Spring of 2021 to support design work. USACE has also been engaged to plan and complete on-site road repairs in areas of extensive erosion.
- ◆ July 2020 - DOE and the National Laboratory Network met to collaborate on actionable recommendations of effective methods for site characterization and groundwater remediation leading to risk reduction at the Bluewater site. The result was a planning document that outlined these actions related to the extent and projected behavior of the Bluewater groundwater plume. Work has started on several of the recommended action items. As part of the DOE-NMED Cooperative agreement, NMED continues to sample wells outside of the Bluewater site boundaries in the fall of each year.
- ◆ October 2021 - Wildlife cameras were installed to monitor for the Gunnison Prairie Dog on site.
- ◆ August 2021 - Phase I of a pollinator study was completed to observe Monarch butterflies, which is listed as a candidate species, which means its status is currently being reviewed to determine whether it warrants listing under the Endangered Species Act.

Planned Activities for 2024 – 2028

- ◆ Ground water monitoring activities will continue throughout the period covered by this plan.
- ◆ Various wildlife conservation efforts (e.g. bat habitat survey, elk habitat improvements, pollinator studies) will be developed and executed throughout the period covered by this plan.
- ◆ 2024 - USACE will complete road repair work.
- ◆ 2024 - Pre-engineering studies will continue for the Main Disposal Cell cover regrading project including geotechnical subsurface investigation completion, hydrology and hydraulic analysis and design alternative analysis. Development of full design package will occur from 2025-2027.
- ◆ 2024 – 2027 - Continue progress on groundwater site characterization tasks in accordance with DOE National Lab Network recommendations to reduce overall site risk.

Homestake Mill Site

Map Location: Bluewater and Homestake Mills Figure, Page 9

More Information: <https://www.nrc.gov/info-finder/decommissioning/uranium/homestake.html>

Lead Agency: NRC

Note – See also Homestake Mill Superfund Site on Page “Homestake Mill Superfund Site” on page 13 for a summary of activities under CERCLA.

The Homestake Mining Company of California (Homestake), Grants Reclamation Project (GRP, a/k/a Homestake Mill) is located 5.5 miles northeast of Milan, NM and is a conventional uranium mill site under reclamation. U.S. NRC Source Materials License No. SUA-1471 was originally issued to Homestake in 1957 by the Atomic Energy Commission. During operations, ore was brought to the site for processing from various mines up to 50 miles away. Homestake deposited uranium tailings into two unlined tailings piles that overlie the San Mateo alluvium. Uranium processing continued until 1990. The site is in the decommissioning phase with an ongoing restoration program which began in 1997.

Tailings generated from the milling operation were placed on two piles, a large tailings pile (200 acres and approximately 100 feet high) and a small tailing pile (40 acres and approximately 25 feet high). The large tailings pile is capped currently with an interim soil cover on its top and a radon barrier and a stone erosion cover on the side slopes. The small tailings pile is also capped by an interim soil cover on its southern portion and is the location of Evaporation Pond 1 on the northern two-thirds of the pile. Final radon barriers will be constructed after groundwater remediation is completed. Seepage from the tailings piles was noted in 1975. The current effort is a major groundwater corrective action plan which is also under the oversight of the EPA through Superfund. A Memorandum of Understanding has been executed between the NRC and the EPA for the Site regarding groundwater remediation. NMED maintains groundwater discharge permit DP-200 at the Site. The regulatory agencies NRC, EPA, and NMED are working cooperatively in the effort to remediate the GRP to levels that are protective of public health, safety, and the environment. The Site will eventually be turned over to the DOE under a General License for long-term surveillance and maintenance.

Completed and Ongoing Activities

- ◆ The NRC reviewed and approved several submissions from Homestake related to the Confirmatory Order issued by the NRC on March 28, 2017, including the Root Cause Protocol, Self-Assessment Report, Analysis of Impact of Exceedances of Groundwater Protection Standards in Injection Water, Collection for Re-Injection Mass Balance/Removal Analysis, Release of Former Groundwater Land Application Areas. Homestake submitted two Groundwater Corrective Action Program license amendment requests that were not accepted for detailed technical review.
- ◆ On November 12, 2019, the NRC staff completed license amendment 54 that updated the groundwater monitoring plan listed in Materials License SUA-1471, license condition 35A, to adjust the compliance monitoring for the groundwater restoration areas.
- ◆ On February 3, 2020, the NRC staff completed license amendment 55 that approved the use of a zeolite water treatment system as an additional method to remediate groundwater.
- ◆ On July 14, 2021, the NRC staff completed license amendment 57 that approved a performance-based license condition incorporating a Safety and Environmental Review Panel.
- ◆ On December 20, 2022, Homestake submitted a license amendment request to change the background monitoring location for radon and ambient gamma radiation. On August 15, 2023, the NRC staff denied the application request.
- ◆ On August 8, 2022, Homestake submitted a license amendment request for groundwater alternate concentration limits. On May 17, 2023, the NRC staff did not accept the application for detailed technical review.
- ◆ On March 21, 2022, Homestake submitted a license amendment request to change the design of the top cover of the large tailings pile from the approved rock cover to an evapotranspiration cover. On September 28, 2022, the NRC staff did not accept the application for detailed technical review. On July 28, 2023, Homestake submitted a revised license amendment request.
- ◆ The Homestake annual surety is updated annually by license amendment.

- ◆ NRC Region IV inspects the Grants Reclamation Project on a semi-annual basis.

Planned Activities for 2024 – 2028

- ◆ The NRC staff expects continued activity on the license amendment request to change the design of the top cover of the large tailings pile from the approved rock cover to an evapotranspiration cover.
- ◆ The NRC staff expects to continue activity regarding the request to change the background monitoring location for radon and ambient gamma radiation.
- ◆ The NRC staff expects continued activity regarding the groundwater corrective action program at the GRP, including the possibility of another Homestake license amendment request for groundwater alternate concentration limits.

L-Bar Disposal Site

Map Location: Jackpile Mine Area and L-Bar Mill Figure, Page 11

More Information: <https://www.energy.gov/lm/l-bar-new-mexico-disposal-site>

Lead Agency: DOE

The L-Bar disposal site is in Cibola County approximately 3 miles east of the Village of Seboyeta and 10 miles north of the Pueblo of Laguna. SOHIO Western Mining Company (SOHIO) operated an on-site mill from 1977 through 1981. About 2.1 million tons of ore was processed at the mill. The milling operation created radioactive tailings, a predominantly sandy material. Tailings and liquid wastes were pumped in slurry form into an on-site tailings impoundment for disposal. All aboveground structures, including the mine and mill buildings, have been demolished. SOHIO completed site surface reclamation in 2000 under Title II of UMTRCA. The site transitioned to DOE in 2004 and is administered under the provisions of a general NRC license. The site requires routine inspection and maintenance, groundwater monitoring, erosion and vegetation monitoring of the disposal cell cover, records-related activities, and stakeholder support.

Completed and Ongoing Activities

- ◆ 2021 - DOE established an interagency agreement with USACE to design and construct stormwater erosion control structures. The intent of this project is to reduce sedimentation of diversion channels, reduce erosional head cutting, and help stabilize drainage areas of the site. As of 2023, data collection and initial design activities are on-going.

Planned Activities for 2024 – 2028

- ◆ 2024 – Execution of road repair project
- ◆ 2024 – Finalization of subsurface geotechnical investigation in support of stormwater erosion control structure repairs.
- ◆ 2024-2025 Development of design preferred alternative and full design package
- ◆ 2027 – Award and construction of the stormwater erosion control structures are anticipated to begin.

United Nuclear Corporation Mill Site

Map Location: Grants Mining District, Page 1

More Information: <https://www.nrc.gov/info-finder/decommissioning/uranium/united-nuclear-corporation.html>

Lead Agency: NRC

Note – See also UNC Mill Superfund Site on Page 18 for a summary of activities under CERCLA.

The United Nuclear Corporation (UNC) Mill Site is a non-operating uranium mill and tailings disposal site located approximately 17 miles northeast of Gallup in McKinley County, New Mexico. UNC operated the site as a uranium mill facility from 1977 to 1982. The Mill Site included an ore processing mill and a tailings disposal area that covers approximately 25 and 100 acres, respectively. This privately owned facility is surrounded by the Navajo Nation Indian Reservation and Tribal Allotment. The mill, designed to process 4,000 tons of ore per day, extracted uranium using conventional crushing, grinding, and acid-leach solvent extraction methods. Uranium ore processed at the site came from the Northeast Church Rock and the Old Church Rock mines.

The milling of uranium ore produced an acidic slurry of ground waste rock and fluid (tailings) that was pumped to the tailings disposal area. The site is currently under decommissioning and reclamation. The previous reclamation plan for the tailings disposal area was reviewed and approved by NRC on March 1, 1991. Uranium milling and tailings disposal were processed, and an estimated 3.5 million tons of tailings were disposed in the tailings impoundments - three cells and two borrow pits. These tailings cells and borrow pits were reclaimed between 1989 and 1995, and they each include a radon barrier. Surface reclamation is complete, except for the area of the south tailings cell covered by two evaporation ponds, which are part of the ground water corrective action plan. The ground water corrective action plan is also under oversight of the U.S. EPA through Superfund. A MOU was executed between NRC and EPA for this site in August 1988 and amended September 2013.

On September 24, 2018, General Electric requested an amendment to their reclamation plan approved as described in License Condition 34 as well as the reclamation timelines defined in License Condition 35. This amendment, if granted, would allow activities at the site to include construction of a Repository for mine-impacted soil and debris on the licensed mill tailings disposal area. Mine waste will be removed from the Northeast Church Rock Mine Site, transported, and placed in the Repository, located on the existing tailings disposal area. On December 21, 2018, the NRC staff contacted GE-UNC, to advise them that the application had been deemed acceptable for review and the formal review process would begin.

The license amendment was granted in February 2023.

Completed and Ongoing Activities

- ◆ March 2019 – NRC staff held public meetings in Gallup, NM to support development of the EIS.
- ◆ September 2020 - Issued Safety Evaluation Report regarding General Electric's request to amend the license.
- ◆ November 2020 – The Draft EIS was released for public review and comment.
- ◆ December 2022 – Revised Safety Evaluation Report was completed.
- ◆ January 2023 – Final EIS was completed.
- ◆ February 2023 – License amendment was granted.

Planned Activities for 2024 – 2028

- ◆ Issue Revised Safety Evaluation Report
- ◆ Issue a final Environmental Impact Statement following reviewing of public comments and other stakeholder participation regarding General Electric's request to amend the license
- ◆ Issue decision regarding General Electric's request to amend the license to allow for the construction of a repository for mine-impacted soil and debris on the licensed mill tailings disposal area.

Assessment & Cleanup of Contaminated Properties

Lead Agency: EPA

Support Agencies: Pueblo and state environmental agencies



EPA Contractor conducting a residential gamma survey. The buggy contains GPS and measuring instruments.

Uranium mining or milling waste was occasionally used as sand for aggregate (in foundations and stucco) and contaminated stones were incorporated into the walls and floors of structures, including homes. Structures may also be contaminated by the presence of mined or naturally occurring radioactive materials in outside dust and soil brought into homes on shoes and clothing. Flagstones and petrified wood have been used as decorative items in homes and in residential landscaping.

Completed and Ongoing Activities

- ◆ During the primary structure assessment period, from 2010 through 2015, the EPA's Removal Program assessed over 900 structures and properties for gamma and elemental uranium contamination. All the villages of the Pueblo of Laguna and communities of the Acoma Pueblo, the villages of Bluewater, San Mateo, and the Cebolleta Land Grant, and the subdivisions south of the Homestake Mill site were assessed. Seven hundred seventy-two (772) structures were found below action levels and deemed to require no action; however, one hundred twenty-eight (128) of the assessed properties had soil radiation above action levels and were cleaned up. One structure was demolished, and another was replaced with a modular house. One resident living near the Johnny M legacy uranium mine was relocated.
- ◆ Subsequent structure assessments have occurred since the primary structure assessment period. One additional tribal structure and one non-tribal structure were identified for removal actions to address elevated levels of indoor-air radon and/or soil contamination in the immediate area of the structure.

Planned Activities for 2024 – 2028

The EPA has completed the residential structure assessment program at properties where consent to access was granted. The EPA will consider additional structure assessments if new information is provided.

Public Health Consultation of the San Mateo Creek Basin

More Information: <https://www.atsdr.cdc.gov/hac/products/consultation.html>

Lead Agencies: New Mexico Department of Health with Support from ATSDR

Background: A health consultation is a verbal or written response from ATSDR or ATSDR's Cooperative Agreement Partners, here being the New Mexico Department of Health, to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. To prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material. In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR or ATSDR's Cooperative Agreement Partner which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

Completed and Ongoing Activities

- ◆ 2010 - 2011 - The NMDOH Environmental Health Epidemiology Bureau (EHEB) recruited volunteers in the Grants Mineral Belt during May and June of 2010 as part of public health surveillance for uranium exposure. The majority of drinking water samples collected were below the safe drinking water standard and the average urine concentration of participants was greater than the national average.
- ◆ December 2019 - EPA requested ATSDR initiate a PHA of the San Mateo Creek Basin following an agreement between EPA and three former mine operators to conduct the RI/FS of the San Mateo Creek Basin Central Study Area.

- ◆ August 2022 – An ATSDR team visited Grants, NM and conducted a site tour of the San Mateo Creek Basin Site with the assistance and guidance of the NMED. ATSDR was able to visit the site, take pictures and notes on site characteristics which will be used for the health assessment. ATSDR also met with representatives from IHS Albuquerque to keep them informed on the site, since the site is located adjacent to several tribal communities.

Planned Activities for 2024 – 2028

- ◆ NMDOH's APPLETREE Program is a cooperative agreement with ATSDR which will support responding to health questions from members of the various communities in the GMD.
- ◆ In 2024, ATSDR will provide U.S. EPA with the type of environmental sampling data ATSDR public health professionals require to conduct a public health assessment or health consultation evaluations in determining whether people living in the basin are being exposed to toxic substances at levels that could harm people's health. ATSDR recognizing that data are collected at hazardous waste sites for a variety of purposes and that ATSDR data needs are not intended to supplant the professional judgment and discretion of those responsible for protecting public health and the environment by cleaning up contaminated sites.
- ◆ 2024 - 2025 – EPA will collect or compile groundwater sampling data of the basin as part of ongoing investigations and share with ATSDR. ATSDR will conduct a health consultation evaluation on the groundwater sampling data to determine whether people living in the basin are being exposed to toxic substances, whether that exposure is harmful to people's health, and what must be done to stop or reduce exposure. This evaluation enables ATSDR to identify and prioritize follow-up activities to protect public health.

Communication & Coordination with Communities

A priority of the federal and state agencies is meaningful dialogue and collaboration with communities and tribes impacted by mining and milling activities. Throughout the duration of this plan, EPA, along with the agency's federal and state partners, will continue to hold community meetings and to apprise the communities in the Grants Mining District with progress under the plan and provide a forum for discussions.

- ◆ Public Meetings for Proposed Plans for sites on the NPL or SA Approach Sites.
- ◆ Community outreach, including public availability sessions, for when EPA releases Engineering Evaluation/ Cost Analysis documents for public comment.
- ◆ Community meetings to update the impacted communities on progress under the Five-Year Plan.
- ◆ Community meetings for general site updates by federal agencies.



EPA and Pueblo of Laguna Staff discuss outreach material for the Jackpile-Paguate Mine.



Grants Mining District EPA Region 6 Webpage:

<https://www.epa.gov/grants-mining-district>



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2024 – 2028

Grants Mining District Five-Year Plan

Addendum 1

**2010 - 2028 Grant Mining District
Summary of Major Activities**

2010 - 2028 Grant Mining District

Summary of Activities

Objective: Sites on the National Priorities List or Superfund Alternative Approach Sites		
Site	2010 – 2023 Major Accomplishments	2024-2028 Primary Goals
Homestake Mill Site	- June 2020 - A Final Remedial Investigation Report was completed by Homestake for OU1 (groundwater restoration) and OU2 (long-term tailings stabilization) that included a baseline risk assessment. - March 2021 - The EPA National Remedy Review Board (NRRB) met with EPA Region 6 and key stakeholders to discuss the site and hear statements from the stakeholders on expectations for a Superfund remedy. - August 2021 – EPA Region 6 and HQs initiated an ambient air modeling study for radon and progeny sourcing from the large tailing pile to verify or update EPA’s risk estimates on radon exposure. - September 2021 - A Superfund Five-Year Review (FYR) was completed by EPA. - April 2023 – EPA HQs Superfund Program National Radiation Expert and the Office of Indoor Air Radiation, in working with Region 6 staff, completed an air modeling study for radon and progeny at the site. - May 2023 - The Groundwater Background Reassessment Technical Memorandum was completed by EPA and NMED. - August 2023 – EPA approves Homestake’s Addendum to the 2020 Remedial Investigation Report for the baseline human health risk assessment for OU1 and OU2.	2025 - Complete the Technical Impracticability evaluation. 2026 - Meet with state and tribal stakeholders to discuss the Proposed Plan and the EPA’s preferred remedy and seek state and tribal concurrence. 2026 - Release a Proposed Plan to the public that identifies EPA’s preferred Superfund remedy for OU1 and OU2 and hold a formal public meeting to present the preferred remedy and a 30-day public comment period for receiving written comments. 2027 - Issue a ROD that describes the Superfund remedy selected by EPA.
Jackpile-Paguate Mine (13 Mine Sites)	2013 – Site was finalized on the National Priorities List 2019 – Administrative Settlement and Order on Consent Signed, beginning the Remedial Investigation/Feasibility Study	Continue oversight of the Remedial Investigation/Feasibility Study

2010 - 2028 Grant Mining District

Summary of Activities

Objective: Sites on the National Priorities List or Superfund Alternative Approach Sites		
Site	2010 – 2023 Major Accomplishments	2024-2028 Primary Goals
San Mateo Creek Basin – Central Study Area	▪ 2019 – Administrative Settlement and Order on Consent signed for Remedial Investigation/Feasibility Study ▪ 2019 – EPA began oversight of 3 parties conducting the investigation	▪ Continue oversight of the Remedial Investigation/Feasibility Study
United Nuclear Corp. Mill Site	▪ Ongoing oversight be EPA of UNC’s implementation of the ground water remedy’s pump and treat system.	▪ Ongoing oversight be EPA of UNC’s implementation of the ground water remedy’s pump and treat system. ▪ Negotiate a judicial settlement with the responsible party to conduct the Remedial Action to place mine waste from Northeast Church Rock Mine at the UNC Mill Site.

Objective: Assess Water Supply Sources for Contamination		
Activity	2010 – 2023 Major Accomplishments	2024-2028 Primary Goals
San Mateo Creek Basin	▪ 2009-2010 – 32 private wells sampled ▪ 2009– Three Milan public water supply wells sampled ▪ 2012 - New Mexico Environment Department completed Phase I and Phase II Expanded Site Investigations ▪ 2014-2015 – 43 private wells sampled ▪ 2014– Three Milan public water supply wells sampled ▪ 2016 - EPA, with support from NMED, released a Phase 1 Groundwater Investigation Report (2016) ▪ 2018 – EPA, with support from NMED, released the Phase 2 Groundwater Investigation Report. Those two reports documented contamination of portions of the shallow alluvial and deeper bedrock aquifers in portions of the San Mateo Creek Basin.	▪ EPA will review sampling results from private wells collected by the NMED.

2010 - 2028 Grant Mining District

Summary of Activities

Objective: Assess Water Supply Sources for Contamination		
Activity	2010 – 2023 Major Accomplishments	2024-2028 Primary Goals
New Mexico Environment Department Well Sampling Program under Department of Energy Cooperative Agreement	▪ 2015: 13 wells sampled ▪ 2016: 9 wells sampled ▪ 2017: 11 wells sampled ▪ 2018: 12 wells sampled ▪ 2019: 21 wells sampled (2 field events) ▪ 2021: 17 wells sampled ▪ 2023: sampling planned for October	▪ Continue annual sampling event of wells near Bluewater, including municipal water supplies. ▪ Install new SAG and alluvial wells outside of the DOE long-term care boundary. ▪ Evaluate data from the new wells to inform the groundwater impacts. ▪ Continue working collaboratively on project development and review of relevant document with EPA and other regulatory partners.

Objective: Assess and Cleanup Legacy Uranium Mines		
Site	2010 – 2023 Major Accomplishments	2024-2028 Primary Goals
Grants Mining District	▪ 98 uranium mines assessed ▪ Aerial gama surveys ▪ Screening Assessments ▪ Site investigations ▪ 4 CERCLA Removal Action conducted by USFS ▪ La Jara, Taff, Vallejo, and Zia Mines ▪ 1 CERCLA Removal Action with USFS Oversight ▪ San Mateo Mine ▪ 4 Mine Reclamations ▪ 2016 - Barbara J #1 ▪ 2016 - Barbara J #2 ▪ 2016 - Barbara J #3 ▪ 2016 - Spencer Mine ▪ AML Safeguarding ▪ 2015 - Hogan Mine	▪ EPA Site Assessment will complete review of 15 mine sites to determine if additional actions are needed. ▪ Partners will continue to share assessment data collected with appropriate stakeholders.
Johnny M Mine	▪ 2017 – Removal Site Evaluation was completed by EPA ▪ 2019 – Released Engineering Evaluation/Cost Analysis for Public Comment	▪ Provide oversight to the construction and implementation of the selected remedy, waste consolidation in an on-site repository

2010 - 2028 Grant Mining District

Summary of Activities

Objective: Assess and Cleanup Legacy Uranium Mines		
Site	2010 – 2023 Major Accomplishments	2024-2028 Primary Goals
Tronox Navajo Area Uranium Mines - Section 10 - East Geographic Sub-Area (Section 35, Section 36) - Central Geographic Sub-Area (Section 17, Section 19, Section 30, Section 33) - West Geographic Sub-Area (Section 22, Section 24, Section 30W) - Spencer Mine	2016 – Spencer Mine – State Reclamation 2019 – Completed Removal Site Evaluations 2020 – Complete Alternative Analysis Memos/Draft EE/CAs 2022 – Section 10 EE/CA Released for Public Comment	2024 – Section 10 - Initiate Non-Time Critical Removal Action 2024-2025 – Release EE/CAs for public comment and begin negotiations with potentially responsible parties for cleanup of mine sites - East Geographic Sub-Area (Section 35, Section 36) - Central Geographic Sub-Area (Section 17, Section 19, Section 30, Section 33) - West Geographic Sub-Area (Section 22, Section 24, Section 30W) 2026 – Initiate Non-Time Critical Removal Actions - East Geographic Sub-Area (Section 35, Section 36) - Central Geographic Sub-Area (Section 17, Section 19, Section 30, Section 33) - West Geographic Sub-Area (Section 22, Section 24, Section 30W)
Department of Energy Defense Related Uranium Mine Program	2023 – Conducted Verification & Validation (V&V) Assessment on 3 mines on the Pueblo of Laguna - Crackpot - Paisano - Sandy	DRUM Program will work with Pueblo of Laguna on the review of the V&V Reports

Objective: Assessment, Cleanup, and Long-Term Management of Former Uranium Milling Sites		
Site	2010 – 2023 Major Accomplishments	2024-2028 Primary Goals
Ambrosia Lake (Phillips) Mill Title I Site	DOE Annual Inspections	- DOE Annual Inspections and Reporting - DOE Annual Engineering Evaluation 2025 and 2028 groundwater sampling

2010 - 2028 Grant Mining District

Summary of Activities

Objective: Assessment, Cleanup, and Long-Term Management of Former Uranium Milling Sites		
Site	2010 – 2023 Major Accomplishments	2024-2028 Primary Goals
Ambrosia Lake West (Rio Algom) Mill Title II Site	▪ NRC Annual Inspections	▪ 2024 - NRC will complete review of overlapping jurisdictional issues in commingled areas with mine waste ▪ NRC expects to begin review of a license amendment request for an additional disposal cell once submitted by Rio Algom.
Bluewater Mill Title I Site	▪ DOE Annual Inspections ▪ 2019-2023 – Pre-Design Work conducted to address depressions at the Main Tailings Disposal Facility	▪ DOE Annual Inspections ▪ 2027 – Complete full design package to address depressions at the Main Tailings Disposal Facility
Homestake Mill Title II Site	▪ NRC Annual Inspections ▪ 2022 – License Amendment Request to change the design of the top cover was submitted. NRC did not accept the application.	▪ NRC Annual Inspections ▪ Expected License Amendment Request to change the design of the top cover of the large tailings pile ▪ Expected activity regarding groundwater corrective action program
L-Bar Mill Title I Site	▪ DOE Annual Inspections	▪ DOE Annual Inspections ▪ Maintain Disposal Cells
UNC Mill Title II Site	▪ 2023 – NRC Approved license amendment allow waste from the Northeast Church Rock Mine to be disposed of at the mill site	▪ DOE Annual Inspections

Objective: Assessment and Cleanup of Contaminated Structures and Properties		
Activity	2010 – 2023 Major Accomplishments	2024-2028 Primary Goals
Pueblo of Laguna	▪ 545 Properties Contacted ▪ 422 Assessments Conducted ▪ 23 Soil Removal Actions Taken ▪ 5 Structural Materials Removal Actions Taken ▪ 24 Radon Abatement System Installed ▪ 1 New structure installed	▪ EPA will review future requests as needed
Pueblo of Acoma	▪ 247 Property Owners Contacted ▪ 93 Assessments Conducted ▪ 2 Soil Removal Actions Taken ▪ 1 Radon Abatement System Installed	▪ EPA will review future requests as needed

2010 - 2028 Grant Mining District

Summary of Activities

Objective: Assessment and Cleanup of Contaminated Structures and Properties		
Activity	2010 – 2023 Major Accomplishments	2024-2028 Primary Goals
Non-Tribal Lands	▪ 599 Property Owners Contacted ▪ 408 Assessments Conducted ▪ 68 Soil Removal Actions Taken ▪ 2 Structural Materials Removal Actions Taken ▪ 29 Radon Abatement Systems Installed	▪ EPA will review future requests as needed

Objective: Public Health		
Activity	2010 – 2023 Major Accomplishments	2024-2028 Primary Goals
Biometric Survey	▪ 2011 – Completed biometric survey, showing participants had 6 to 9 times higher uranium in urine than national average	None Identified
Public Health Assessment	▪ 2019 – EPA requested ATSDR conduct a Public Health Assessment	▪ EPA will share groundwater sampling data with ATSDR as it is collected to facilitate completion of the Public Health Assessment.