

**2003 Abandoned Mine Land Reclamation Awards  
Nomination Cover Sheet**

**Name:** Cove 3 – Phase 2 AML Reclamation Project

**Location:** Cove, Arizona

**Nomination Submitted by:**

Contact: Madeline Roanhorse, Department Manager  
Navajo Abandoned Mine Land Reclamation Program (NAMLRP)  
P.O. Box 1875  
Window Rock, Arizona 86515  
Telephone: (928) 871-6982

**Project Start Date:** August 13, 2001  
**Project Completion Date:** December 24, 2001 (total of 135 Calendar Days)  
**Contract costs:** \$1,270,700  
**Contractor:** Lansing Construction & Triad Western Contractors,  
A Joint Venture

**Nomination Submittal Date:** March 14, 2003

## **NAVAJO NATION AND HISTORY**

The Navajo Nation is located within the three (3) southwestern states of Arizona, New Mexico, and Utah within the four corners area. The Navajo Nation encompasses approximately 25,000 square miles and has an overall population exceeding 250,000 people. Mining activities within the Navajo Nation date back into the 1800's. The major type of ore produced include Coal, Uranium, Copper, and Sand & Gravel. Utilizing the benefits of the Surface Mining Control and Reclamation Act (SMCRA) of 1977, the Navajo Nation has been effectively addressing the Abandon Mine Lands (AML) problems that have scared our lands.

The Cove AML area is located within the Northeastern part of Arizona. Truly one of the hidden tourist areas, only known to a hand-full of individuals besides the locals, Cove is a very scenic mountain range with natural red geologic sandstone layers, dartsed with igneous intrusions. The area lends itself to outdoor activities such as hiking, mountain biking, hunting, camping, cross-country skiing, wood hauling, livestock grazing, wildlife watching, photography, research opportunities and curious minds.

For purposes of the war efforts in the early 1940's, uranium and vanadium became very valuable minerals to the U.S. government (U.S. Atomic Energy Commission). Thus interest in uranium deposits within the Navajo Nation became more in demand. The natural outcrops were located within the Saltwash member of the Morrison Formation of the Jurassic Age. This geologic unit stretches from the four corners area, AZ/NM/CO/UT to the Grants, NM district, over 150 miles. The U.S. government subsequently subsidized the exploration for uranium and vanadium. The Navajo Nation has numerous miles of exploration roads across the uranium rich territories of Navajo land. The legacy of the uranium and vanadium mines has had a long-lasting impact on Navajo people and the environment.

With the location of the valuable deposits, numerous young, inexperienced Navajos sought employment opportunities from these nearby mines. Safety and Health considerations were not of high priorities. Numerous men and descendents have now suffered health problems as a result of these uranium mines. The environment also continues to show the problems associated with the abandoned mine lands and environmental degradation.

## **PROJECT BACKGROUND**

The overall Cove area has been inventoried with over 240 AML sites. Mining within the Cove area occurred in the early 1950's to the late 1960's. Millions of tons of earth have been disturbed by past mining. The elevation within this area ranges from 7,000 to 8,000 feet above sea level. Reclamation efforts within the Cove area have been subsequently broken into phases to address the size of the overall effort and to work within NEPA and weather constraints. Problems from the AML sites include health and safety of the public, livestock and wildlife; water quality; and aesthetics.

The earliest projects were initiated in the early 1990's. In order to complete the reclamation efforts within Cove, a 3-year planning phase was incorporated. Emphasis was placed on the staff's health and safety, thus following our in-house Health Physics Monitoring Plan was vital during the different assessment phases. The most time consuming effort concentrated on the Mexican Spotted Owl (MSO) inventory, reporting and consultations with U.S. and Navajo Fish and Wildlife. Working with Navajo and Federal agencies was important. Within the Navajo Nation's Division of Natural Resources, Navajo AML performed some type of consultation with seven (7) out of ten (10) departments.

## **PROJECT IMPLEMENTATION**

The Cove 3-Phase II AML reclamation project addressed a total of 61 AML sites within 11 project groupings. In compliance with the National Environmental Policy Act (NEPA) and design criteria, the project proceeded to incorporate the plans to address 55 portals utilizing 700 cubic yards of Polyurethane foam, 71,000 bank cubic yards of Dangerous Piles and Embankments, 58,000 bank cubic yards of cover material, elimination of 3,600 linear feet of dangerous highwalls, installation of 4,200 linear feet of diversion berms, 18.5 acres of revegetation, and the blocking of 4.6 acres of access roads.

Mining techniques implemented underground room and pillars with some open stoping. Very little activities involved open pits and rimstrips. The mine sites within this mountainous terrain are located at the edge of the steep slopes and cliffs. Thus personnel and equipment were constantly on the edge of the cliffs. This made it very difficult to perform the cut and fill backfilling techniques of the associated mine waste. It is estimated that less than 50% of the mine waste was accessible by current equipment such as dozers, loaders and excavators.

Through Partnering efforts, Navajo AML and the Contractor worked together to complete the project. The contractor was allowed to work simultaneous projects and 10 hour days. For a few weeks, the contractor was allowed to work a 50 hour work week. Advance review of upcoming projects also helped the contractor prepare for the next activities. The Partnering concept was very important on these uranium mines because Navajo AML per our in-house Health Physics Monitoring Plan requires the contractor to implement a selective handling technique to address the low-level radioactive mine wastepiles during the cut and fill techniques during backfilling. With the coordination, there were minimal delays in obtaining our final post reclamation contours with minimal radiological concerns.

This project with the restrictions from NEPA compliance and weather, was scheduled for 105 calendar days, but was actually completed in 135 calendar days. This project was successfully completed although other problems were encountered such as drought conditions during the months of September through November, followed by inclement weather during December, roughed mountainous terrain, steep slopes and unstable highwalls, bad conditions of access roads, fire restrictions, and difficulty in obtaining clean cover material.

## RESULTS

Many of the sites are within easy access by the public and local citizens. Evidence of site visitations were noted by the public, livestock and wildlife to these dangerous and radioactive mine sites. The land has been returned to beneficial use and the dangerous features associated with the abandoned mine lands has been eliminated. The project was completed in compliance with the purpose of SMCRA. Reclaimed lands are now aesthetically pleasing and open to the community and wildlife. The lands once again consist of landforms that blend with the natural topography and scenic terrains of the area.

This project is being showcased by our program as a model of reclamation efforts. Interested groups have included other Navajo Nation departments, U.S. and Navajo EPA, U.S. Army Corp of Engineers, local colleges, and research groups.

Navajo AML has gained valuable in-house experience from this project. Staff were given the opportunity to learn and fine-tune our engineering skills by actually designing the projects and utilizing the latest in technology such as GPS and total-stations, Auto CAD, SurvCADD, and ArcInfo. Staff also learned some of the requirements of compliance with the National Environmental Policy Act. The only outside consultants that were required involved Archaeological surveys. Biological and Environmental Assessment requirements were completed in-house. Utilizing the Value Engineering concepts, all key field staff were involved with decision making. This was also an opportunity to update our Contract Documents and Health Physics Monitoring Plan.

Overall, this project was complicated by the nature of the terrain, scope-of-work, health and safety concerns, NEPA restrictions, and limited construction timeframe. The project was successful due to the dedicated individuals involved, successful project management approach and partnering concept.

## **PHOTOS:**

- Photo #1: Overall view of the Cove AML Project location, Cove, Arizona. Photo shows the type of terrain and natural vegetation.
- Photo #2: Pre-reclamation conditions of Project A. This project consist of open portals, over 25,000 bank cubic yards of dangerous piles and embankments. This project is located within a natural canyon. Preliminary construction work involving access road upgrading is beginning.
- Photo #3: Post-reclamation conditions at Project A. The portals have been closed utilizing PUF and Concrete bulkheads. The dangerous piles and embankments have been reduced and covered with clean, natural material. The drainage patterns have been diverted and reestablished. The project have been revegetated with native species and access roads have been eliminated.
- Photo #4: Active-reclamation conditions at Project B. The dangerous piles and embankments have been buried within existing highwalls and is presently being covered with clean, natural material. Equipment being utilized include dozers and an excavator. Also required is a water truck, not currently visible. Thus the slopes are being blended in with the natural terrain.
- Photo #5: Polyurethane Foam (PUF) closure on an open portal. Due to the size of this opening, approximately 12'w x 10'h x greater than 50'depth, the PUF had to be done in phases with appropriate safety equipment. This portal closure took less than 1 day with a crew of 5 individuals.
- Photo #6: Photo of wildlife that will continue to benefit from the successful reclamation performed by the Navajo Abandon Mine Lands Reclamation Program (NAMLRP).