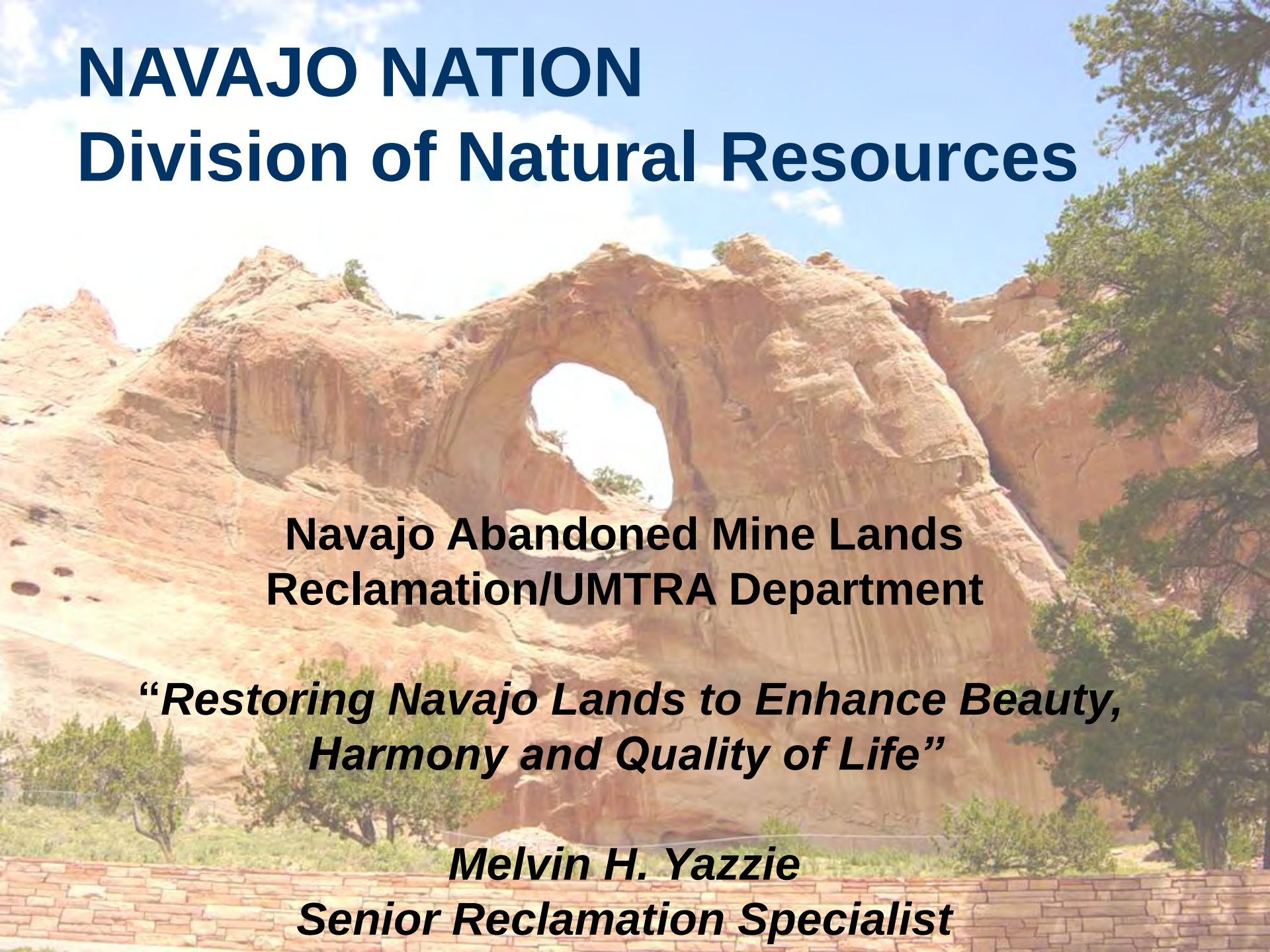
NAVAJO NATION
Division of Natural Resources



Navajo Abandoned Mine Lands
Reclamation/UMTRA Department

"Restoring Navajo Lands to Enhance Beauty, Harmony and Quality of Life"

Melvin H. Yazzie
Senior Reclamation Specialist

Navajo Abandoned Mine Land Reclamation/UMTRA

- Abandoned Mine Lands reclamation projects
- Public Facilities Projects
- Navajo UMTRA Program
- Partnerships/Future

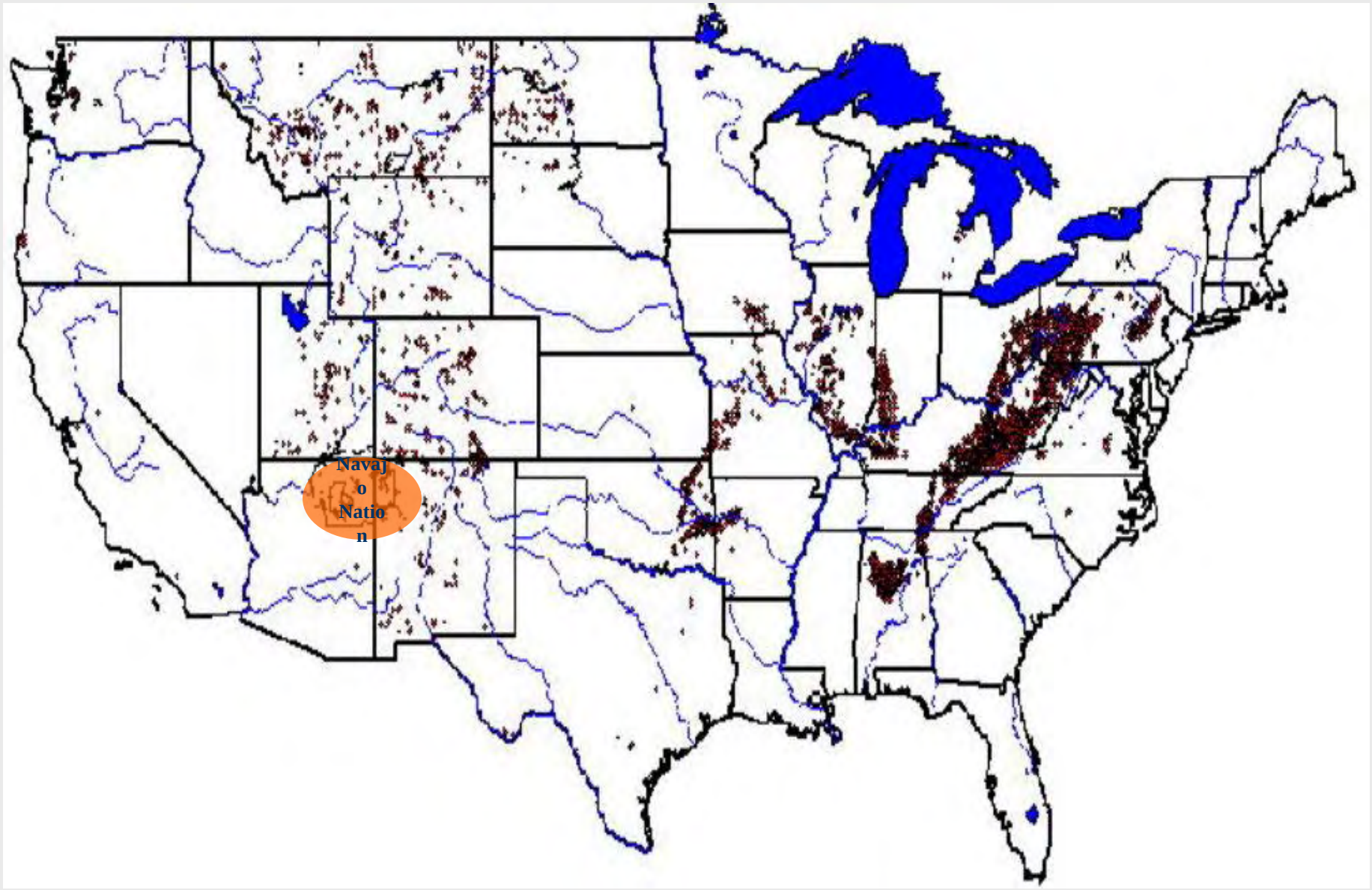
Public Law 95-87

Surface Mining Control and Reclamation Act (SMCRA) of 1977

U.S. Department of Interior

*Amendments: most recent in 2006

National Association of Abandoned Mine Lands Reclamation Programs (NAAMLRP)

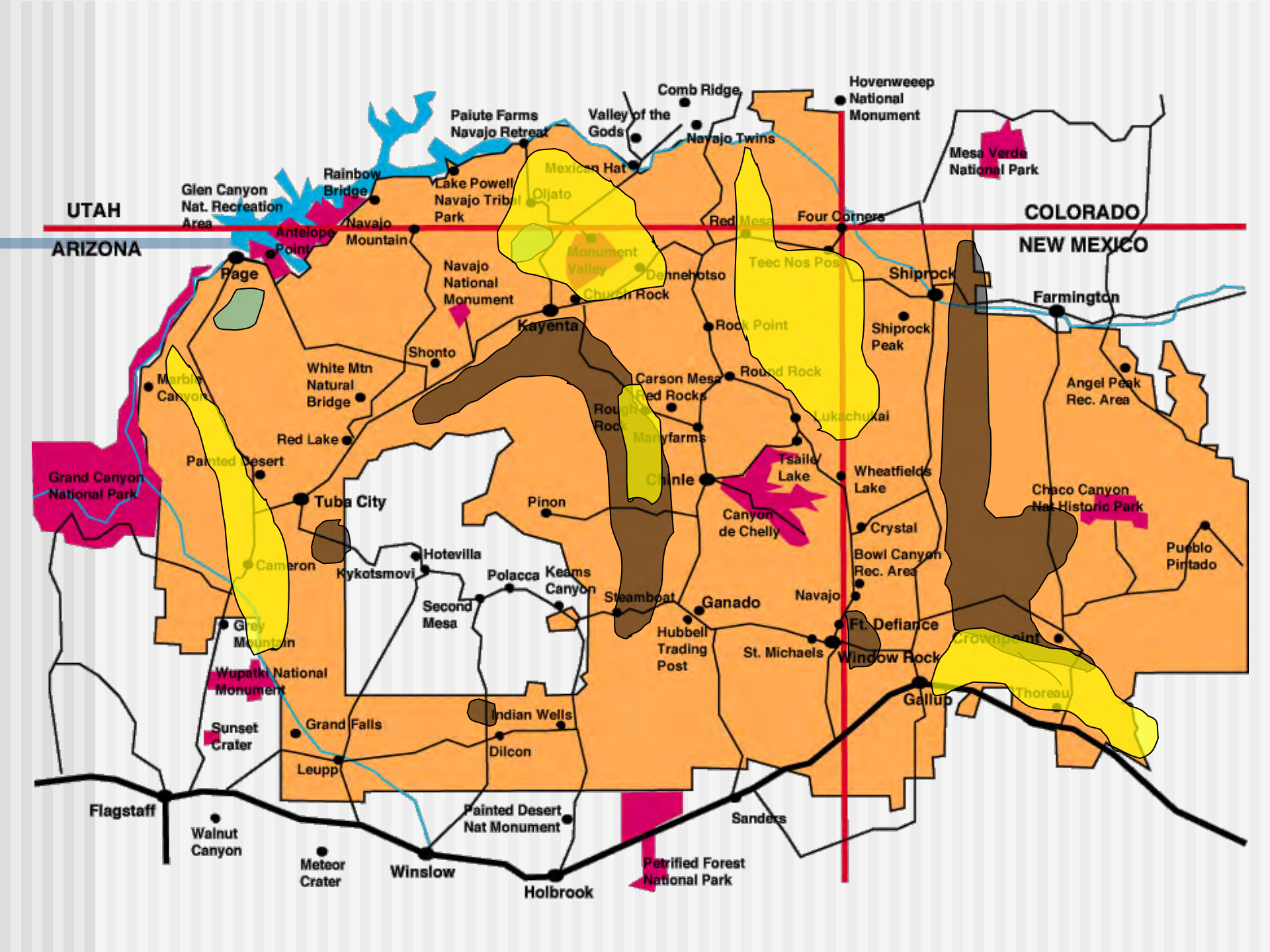


SMCRA

- In 1977, Congress passed the Surface Mining Control and Reclamation Act (SMCRA) of 1977, Public Law 95-87 to help regulate the Coal Industry and set up an Abandoned Mine Lands (AML) reclamation fund.

- Lands and waters eligible for reclamation under this authority are Tribal Trust Lands which were mined or affected by mining and abandoned or left in an inadequate reclamation status prior to August 3, 1977 and for which there is no continuing reclamation responsibilities under Federal, State and Tribal laws.

Photos: Coal, Uranium, Copper, and S&G


UTAH
ARIZONA
COLORADO
NEW MEXICO
Comb Ridge
Hovenweeep National Monument
Paiute Farms Navajo Retreat
Valley of the Gods
Navajo Twins
Mesa Verde National Park
Glen Canyon Nat. Recreation Area
Rainbow Bridge
Lake Powell Navajo Tribal Park
Mexican Hat
Oljato
Four Corners
Antelope Point
Navajo Mountain
Page
Navajo National Monument
Monument Valley
Teec Nos Pos
Shiprock
Farmington
Kayenta
Shonto
Rock Point
Shiprock Peak
White Mtn Natural Bridge
Carson Mesa
Round Rock
Angel Peak Rec. Area
Red Lake
Lukachukai
Grand Canyon National Park
Painted Desert
Tuba City
Pinon
Tsaile/ Lake
Wheatfields Lake
Canyon de Chelly
Chaco Canyon Nat Historic Park
Crystal
Hotevilla
Cameron
Kykotsmovi
Polacca
Keams Canyon
Bowl Canyon Rec. Area
Pueblo Pintado
Second Mesa
Steamboat
Ganado
Navajo
Ft. Defiance
Hubbell Trading Post
St. Michaels
Window Rock
Wupatki National Monument
Gallup
Indian Wells
Sunset Crater
Grand Falls
Dilcon
Leupp
Flagstaff
Painted Desert Nat Monument
Sanders
Walnut Canyon
Meteor Crater
Winslow
Petrified Forest National Park
Holbrook

Example of AML Problems – Surface and Underground.

High Priority Mining Problems:

Open pit w/standing Water. Uranium mines -used for livestock & swimming

Open pit used for Illegal trash dumping

Mining Problems:

Mine waste that blends in with the natural topography.

Dangerous openings:

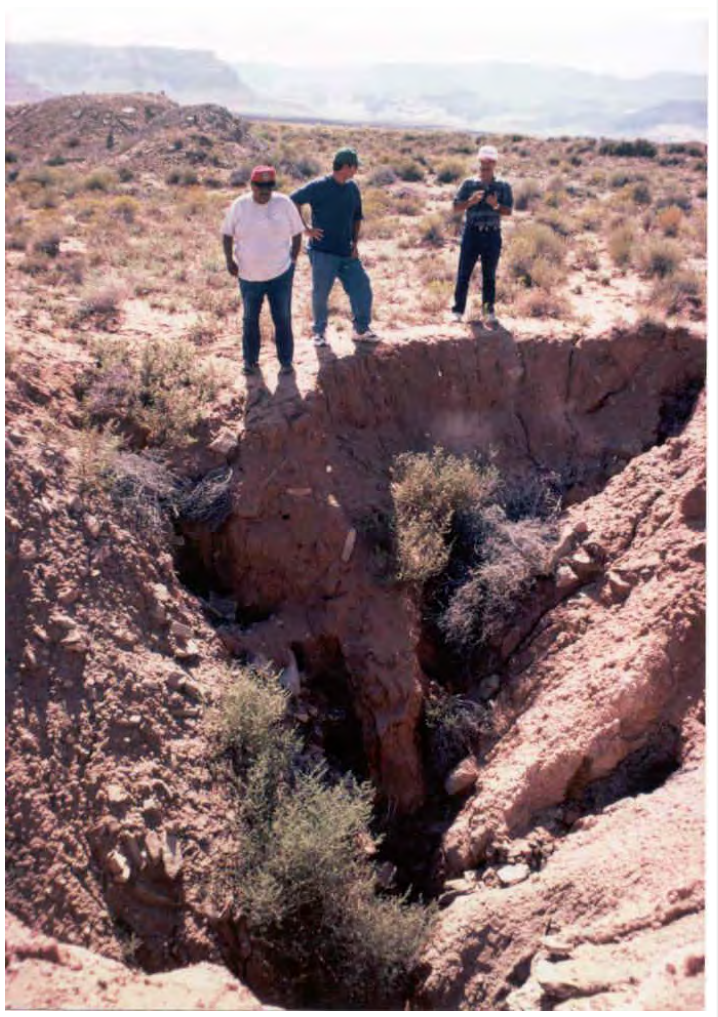
Lures public to enter to explore, exposes them to radiation and unsafe conditions.

Uranium mines used
For livestock containment

Radiation exposure of livestock associated with illness of past Miners, from the food chain effects.

Mining Problems:

Unknown underground workings, dangers to recreational purposes.



Mining Problems:

Underground workings prone to subsidences and unstable.

Abandoned Mine Waste

(Coal)

Contaminates drainages, can become coal fires, aesthetic problems.

Abandoned Mine Waste

(Non-Coal)

Low Priority:

Small rimstrip (dozer cut) and prospect (small opening).

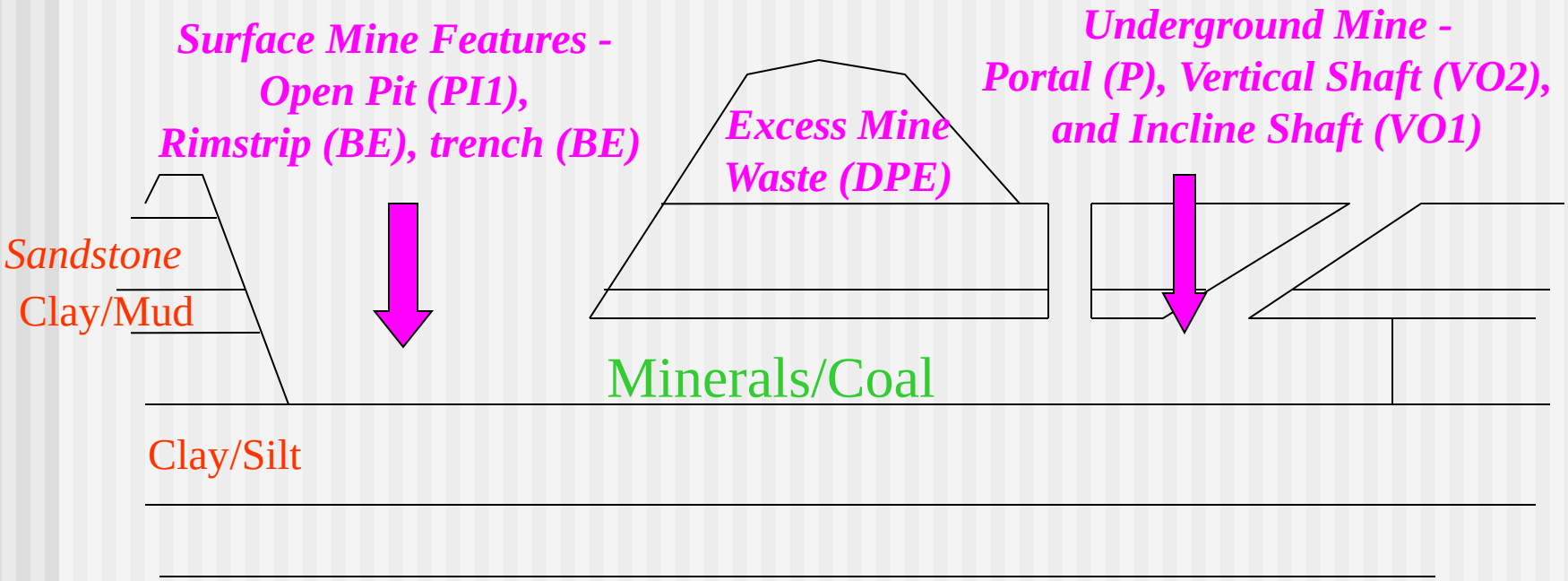
Public Relations:

Common Questions:

- What kind of Public Relations is required?
- How do you address Uranium Mines?
- Are there any special considerations?
- Comprehensive Public Relations effort involves:
  - **Our Staff**
  - **Land Users**
  - **Community/Public**
  - **Chapter Officials**
  - **Other interested parties**

Mining - Surface /Underground?
(Engineering and Geology)

- Mining methods, stability, engineering, accessibility, dangers, properties, reclamation techniques and cost.



HEALTH PHYSICS:

- Employee Protection
- What are we protecting ourselves from?
- Personnel and Training?
- What kind of field equipment is required?
- Field Applications?

In-house uranium radiometric concepts:

- Class A material - geologic material that is near natural background levels.

- Class B material - geologic material that exhibits radiometric levels above natural background, but below 25 pCi/gm of surface contamination or 50 uR/hr of true exposure at 1-meter.
- Class C material - geologic material that has radiometric levels above 25 pCi/gm of surface contamination and 50 uR/hr of true exposure levels, emphasis placed on backfilling this material first.

Health Physics and Radiological Equipment

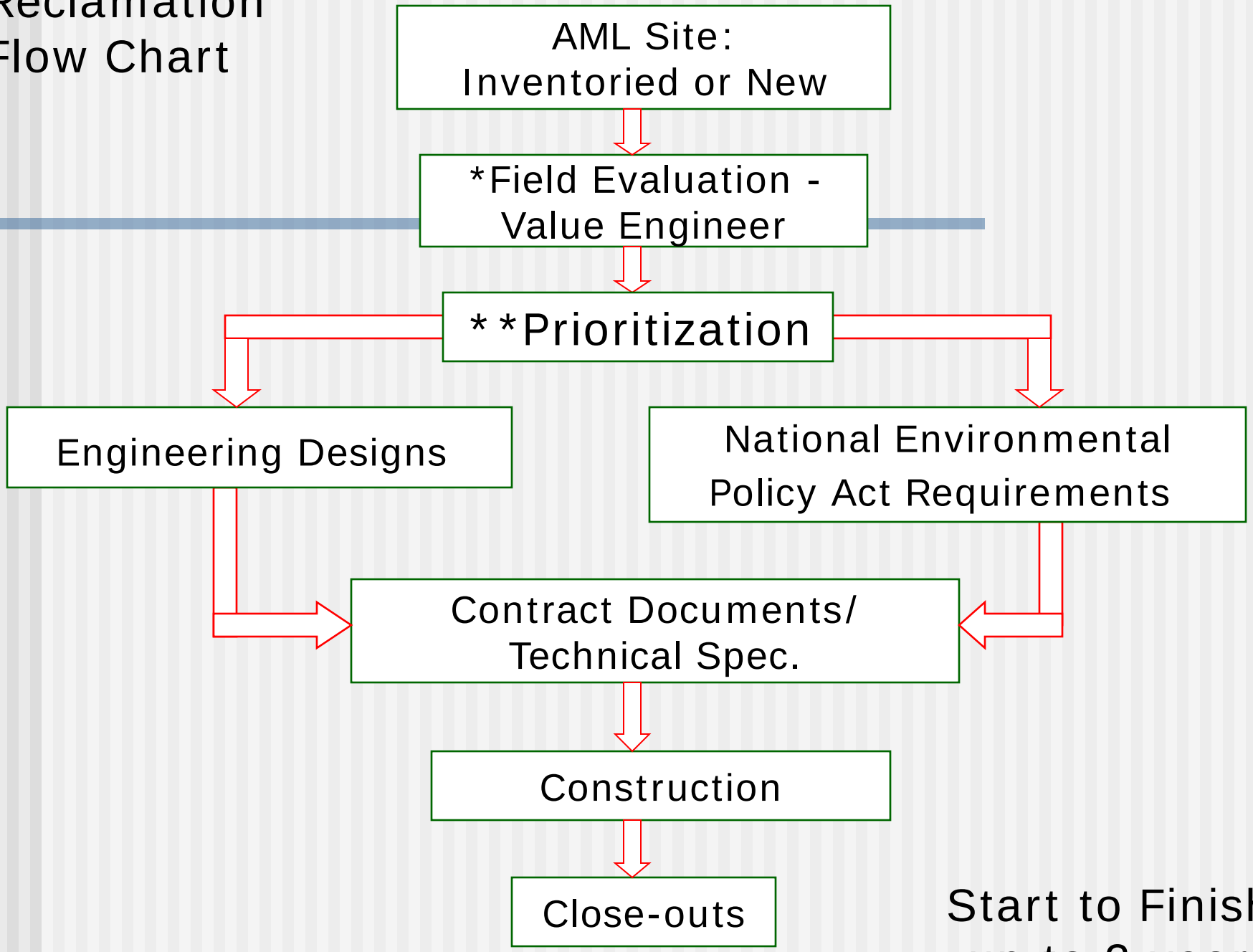
- Health Physics Monitoring and Construction Plan
- Health Physics Training for all field crew
- In-house guidelines for radiometric levels
- Staff knowledgeable through training and background with
- Maps for technical designs

- Construction Monitoring of Equipment and Personnel
- Training to in-house personnel and other entities
- History of Uranium mining - very important aspect of our Program

Reclamation Techniques

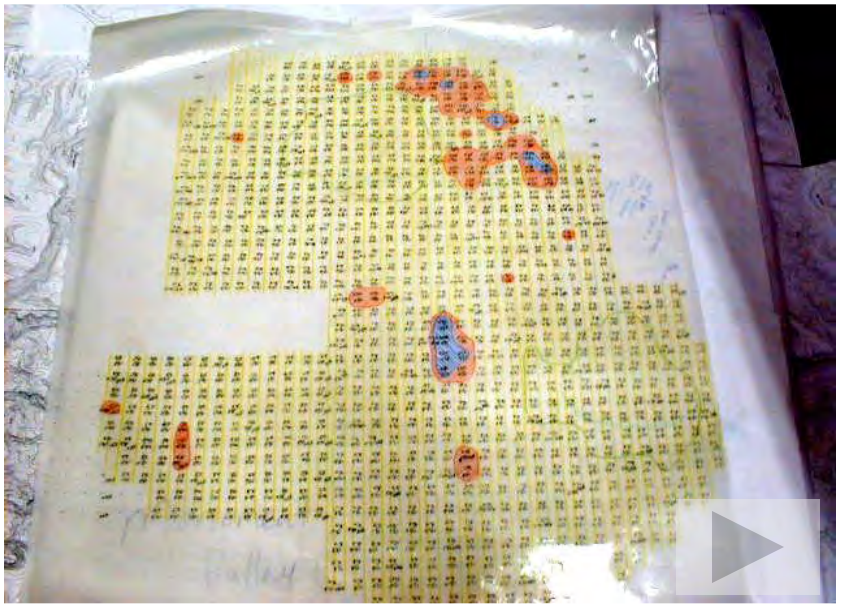
Surface and Underground Mines

Reclamation Flow Chart



Start to Finish:
up to 2 years

Radiological Data/Map



Mine Waste

Dust Suppression

Class A

Placement

Class A Cover

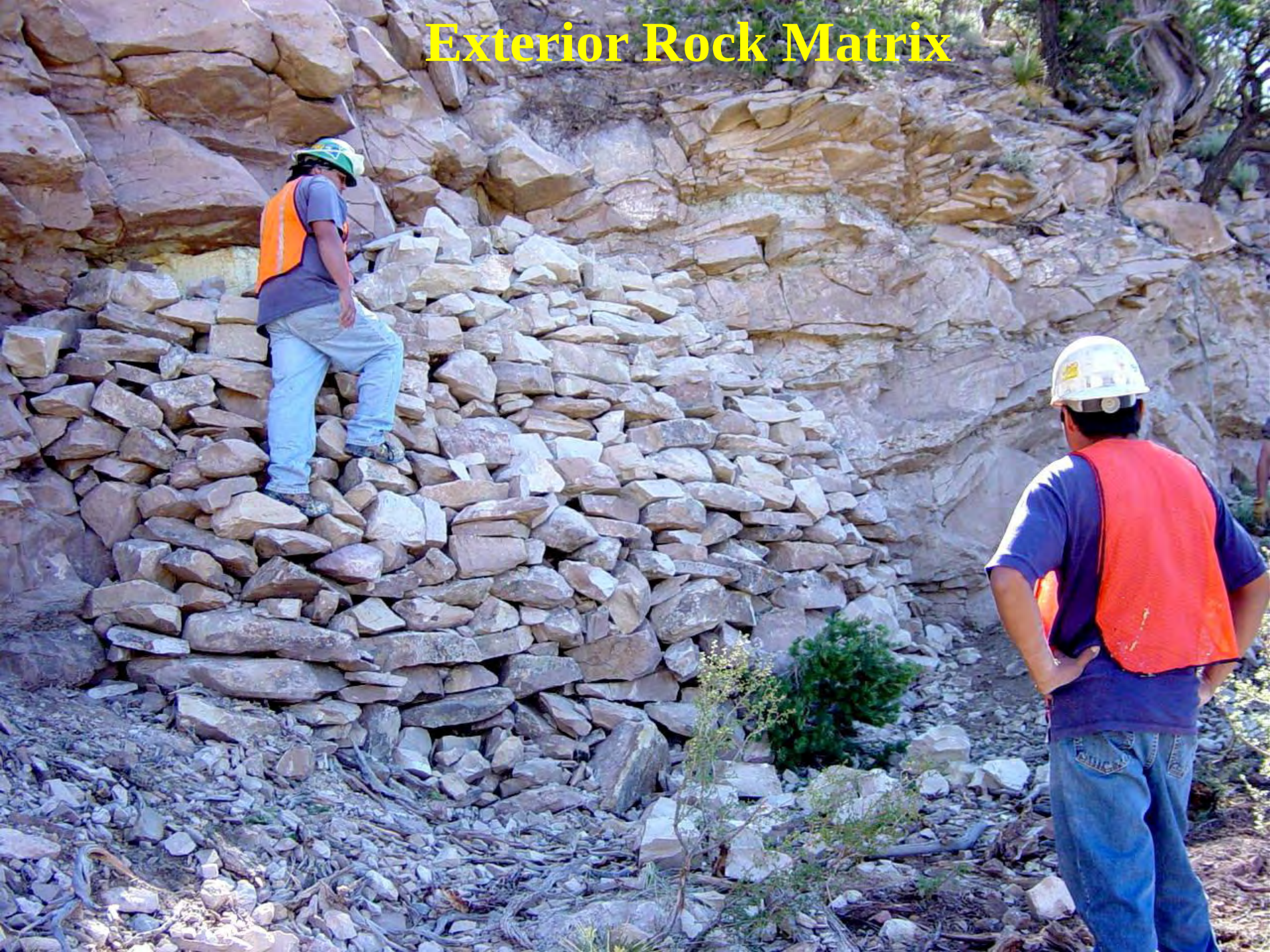
Contoured

Benefits: Dangerous underground mines are closed

Polyurethane Foam

Polyurethane Foam Closure

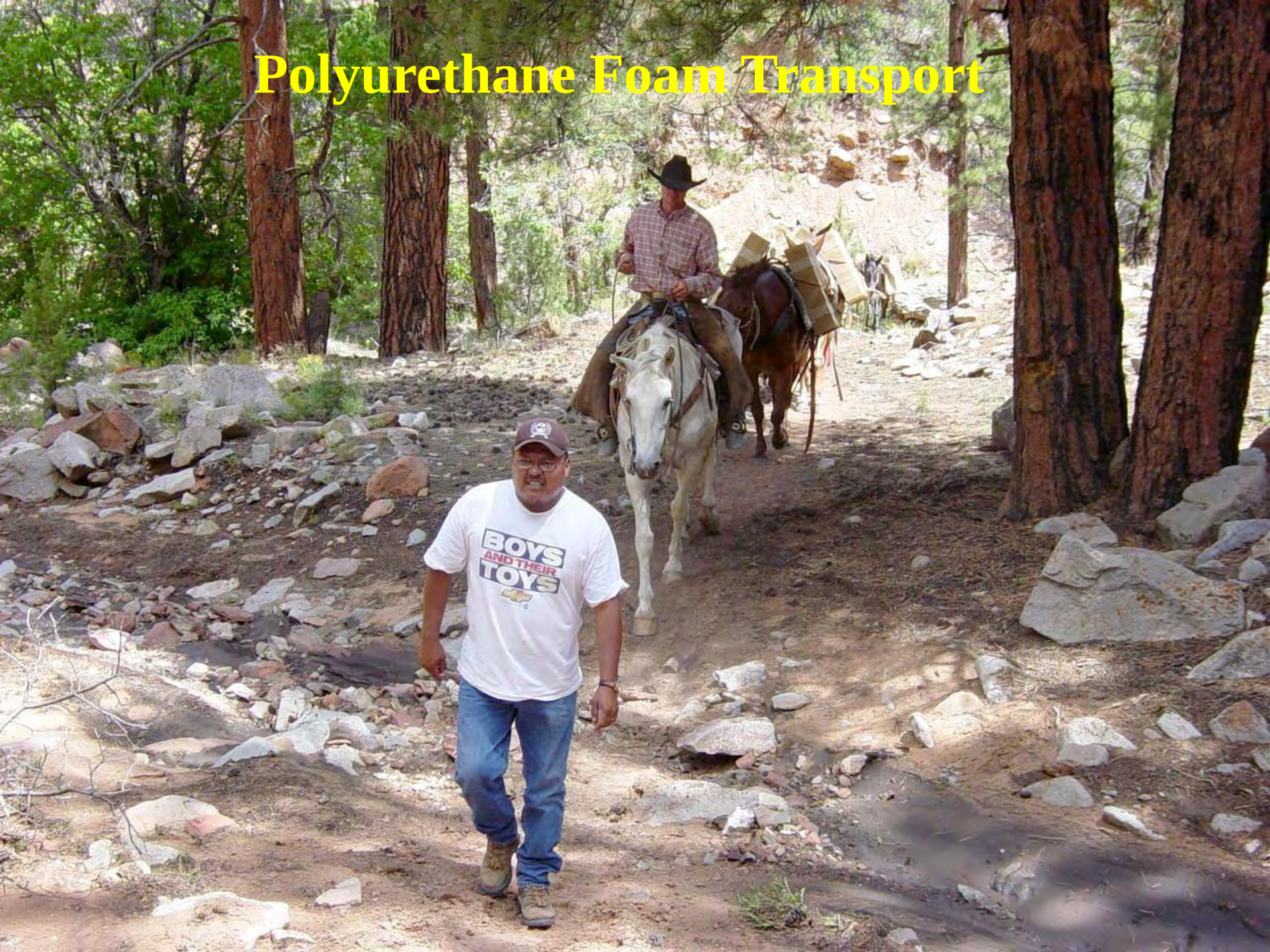
Exterior Rock Matrix



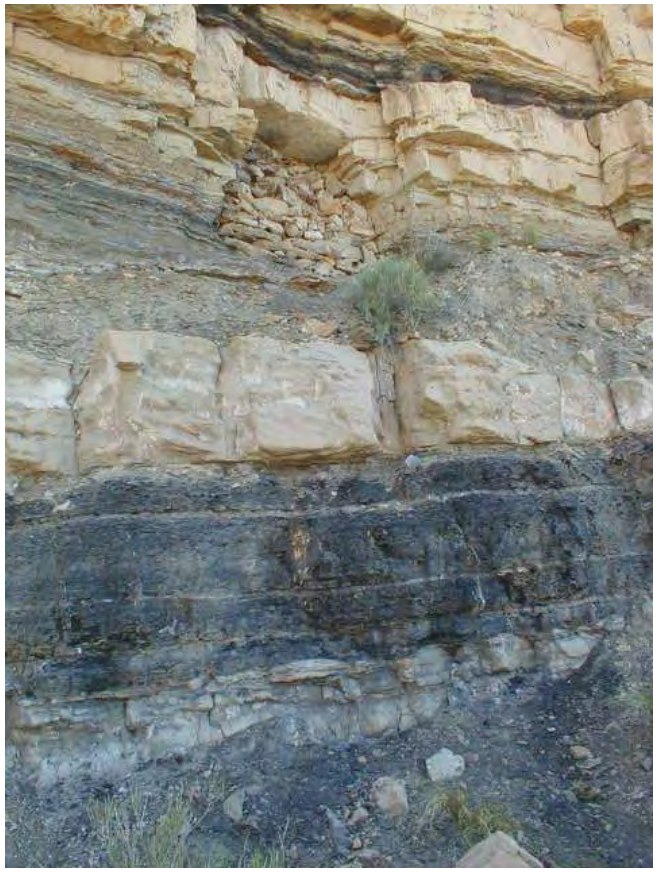
Benefits: Wildlife habitant is restored


Portal Bat-gate

Polyurethane Foam Transport

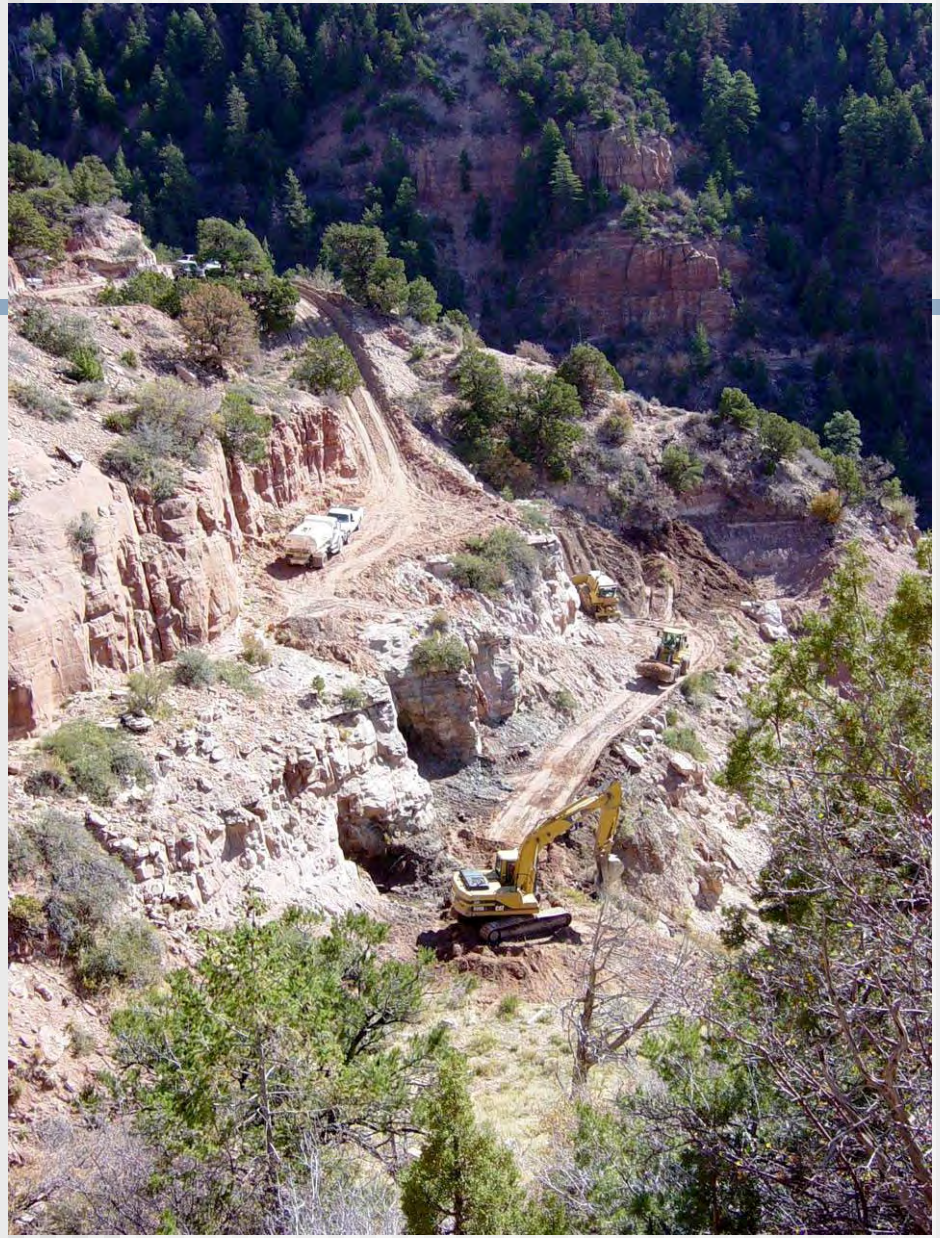


Benefits: Produced Quality Navajo Nation Workforce



<u>Benefits:</u> Contributes to local economy thru Contracting out projects.

Benefits: Land is restored



Reclamation Techniques:

- Engineering Alternatives and cost estimates
- Radiation surveys, pre & post reclamation
- Backfill portals, pits, with waste, and cover with clean material
- Use PUF for cost effectiveness, where applicable
- Redirect drainages, Revegetation, contours
- Monitor for erosion or subsidences
- All the work is contracted out

2006 Estimates

Coal Reclamation Projects

- Total of 44 Coal Projects initiated.
- 260 Coal sites reclaimed.
- Total cost approximately $3 million.
- Coal certification in 1994.

Non-Coal Projects (Uranium, Copper)

- Total of 1,085 non-coal AML sites inventoried
- 273 non-coal reclamation projects initiated
- Overall: 944 AML sites have been reclaimed as of March 2004; 90% of the total inventoried AML sites.
- Cost for 944 AML sites at approximately 23 million dollars.

***Continue to evaluate, for eligibility, any new AML sites that are reported.**

Summary

- The objectives of SMCRA have been fulfilled in respect to protecting the general public, livestock, wildlife and the environment.
- Land has been restored to a more natural setting.
- The dangerous features associated with past mining have been eliminated.
- Land is more beneficial for livestock, wildlife, and recreational purposes
- Work generated from the AML projects have been going back to the Navajo Nation economy, Navajo Contractors and Navajo work-force.

Navajo Abandoned Mine Land Reclamation/UMTRA

- Abandoned Mine Lands reclamation projects
- Public Facilities Projects
- Navajo UMTRA Program
- Partnerships/Future

Future:

- Implement the changes from the reauthorization of SMCRA which was recently passed.
- Continue work on AML sites, Coal, Non-Coal and Eastern Agency. This will include new and maintenance work.
- Provide technical assistance related to AML/PFP activities and participation on AML issues.
- Continue work on the Navajo GIS database to include Coal and PFP project locations and information.
- Provide NAMLRP information to other Navajo Nation Departments, governments and chapters.
- Continue with Public Relations, Partnerships and provide technical assistance to others, if available.

What is the Purpose of Partnership(s)?

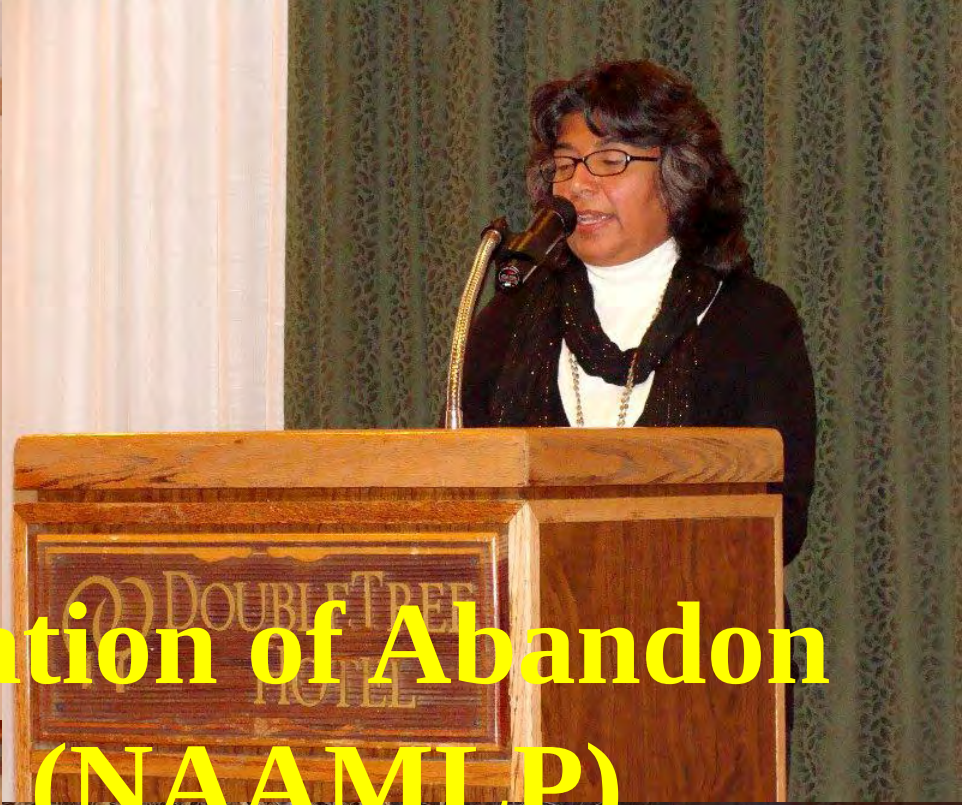
- What do you want to accomplish?
  - You must have an end in mind, deliverable, timeframes.
  - You must think in terms of a win/win situation.
  - Timely completion of projects with limited resources.
  - Address common issues with innovative solutions.
- How will it be beneficial to all parties?
  - Both parties or more, who will be the lead agency?
  - What do you bring to the table – expertise, etc.
- Are you flexible?
- What kind of agreement is required?
  - MOA's, MOU's, AA's, Inter-departmental, etc.

Who will be involved?

- Who are some potential partners?
  - Colleagues, associates, stakeholders, universities, corporations, local, tribal, state and/or federal agencies.
- Need to create some accountabilities and responsibilities.
- Develop a communication Plan with points of contact.
- Identify the expertise available.
- Think outside the box for assistance.
- Develop a scope of work for all to review.
- Schedule regular update meetings.

Why do you need Partnerships?

- Utilize others expertise
- Joint funding sources
- Resources and equipment
- Lack of personnel
- Time efficiency and cost effective
- Record requirements or audits, good book-keeping
- Regulatory requirements
  - Environmental policies
  - Oversight or inspections



National Association of Abandon Mine Lands (NAAMLP)


Southwestern AML
Partnership Group

Abandoned Uranium Mines (AUM) Initiatives

- Further Assessment on Uranium mines throughout the Navajo Nation
- Partners: Navajo EPA, US EPA, NAMLRP, US ACE, OSM, others . . .
- How can we maximize the current regulatory authorities: SMCRA, CERCLA, Brownfields and RAMS.
- **Others? Who else can assist or who else is responsible?**

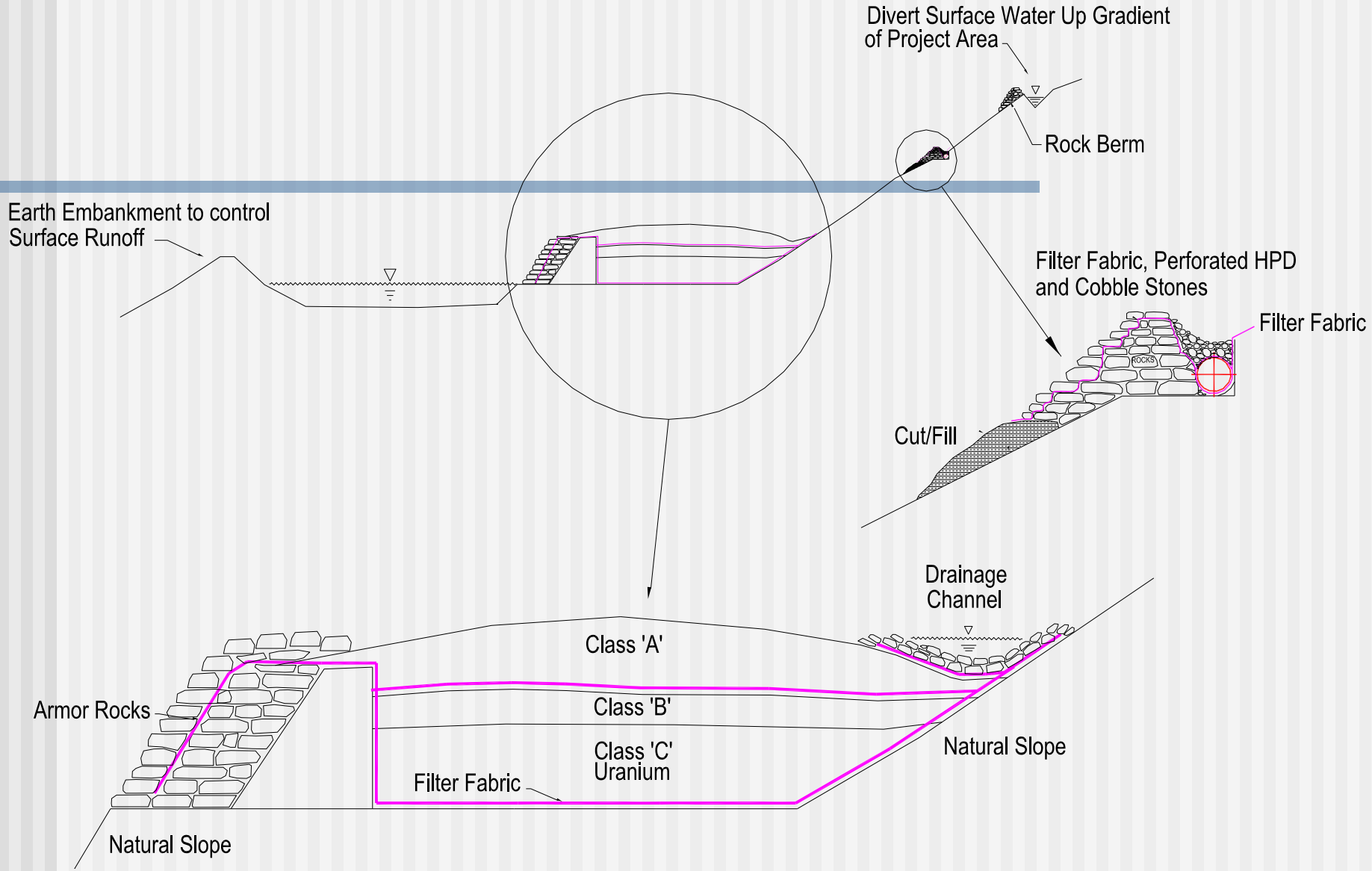
AML Reclamation/future

- Long-term stewardship - **GIS**
- Maintenance & Monitoring
- Pilot Projects
- New Technology
- Partnerships/Funding

- *Research, Learning, Education and Open Minds*

Mother Nature/ Stability

Concepts



Concept for future projects

Example of Inaccessible mine waste

Uranium Mine Waste Impacts to Surface Water


Prepare containment cell.


Excavation of mine waste.
HITACHI

Top filter fabric before Class A soil.

Inaccessible mine waste and contained.


NA-0907 Completed February 2009

1.5 years later NA-0907

Minimizing impact to surface water.

- Geomorphic Contouring
- Low-Impact Development (LID)

- Rain gardens, Bioretention, French drains, Mulch – rock/organic, traditional . . .


Lesson's Learned:
Research, Partnerships, Capacity Building, Funding, Limitations, Communication – message.

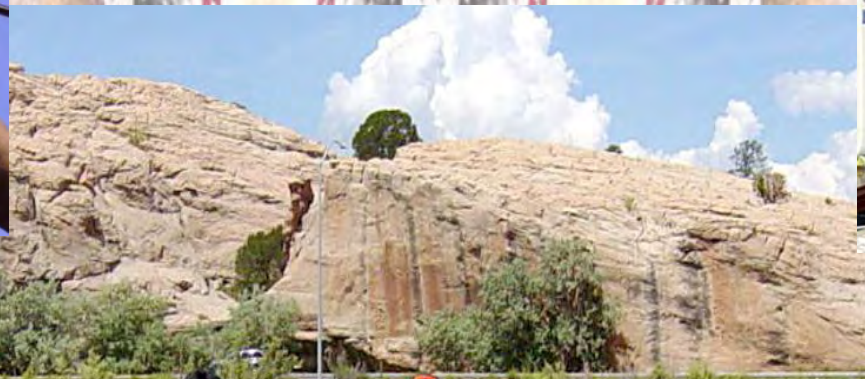
DNR Executive Director:

Mr. Fredrick White

NAMLRP Dept. Manager:

Ms. Madeline Roanhorse

Navajo AML Staff



Navajo AML Reclamation Program: (928) 871-6982

www.aml.navajo.org