

# Tuba City Scoping Meeting

U.S. Department of Energy (DOE)  
Office of Legacy Management (LM)  
UMTRCA Program Manager

Moenkopi Legacy Inn & Suites  
Tuba City, Arizona

April 6, 2016



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# Welcome

## ■ Welcome and Introductions

- Milton Bluehouse, Jr.

## ■ Invocation

- Milton Bluehouse, Sr.
- Leroy Shingoitewa

## ■ Presentation

- DOE

## ■ Community Comments

- Attendees

## ■ Closing Prayer

- Milton Bluehouse, Sr.
- Leroy Shingoitewa



# Meeting Purpose

- DOE LM will:
  - Discuss site history
  - Describe current operation and options for future site activities
  - Answer frequently asked questions about uranium
- Community members will have an opportunity to:
  - Provide input on addressing groundwater contamination at the site
  - Suggest alternative options
  - Learn how public input will be included



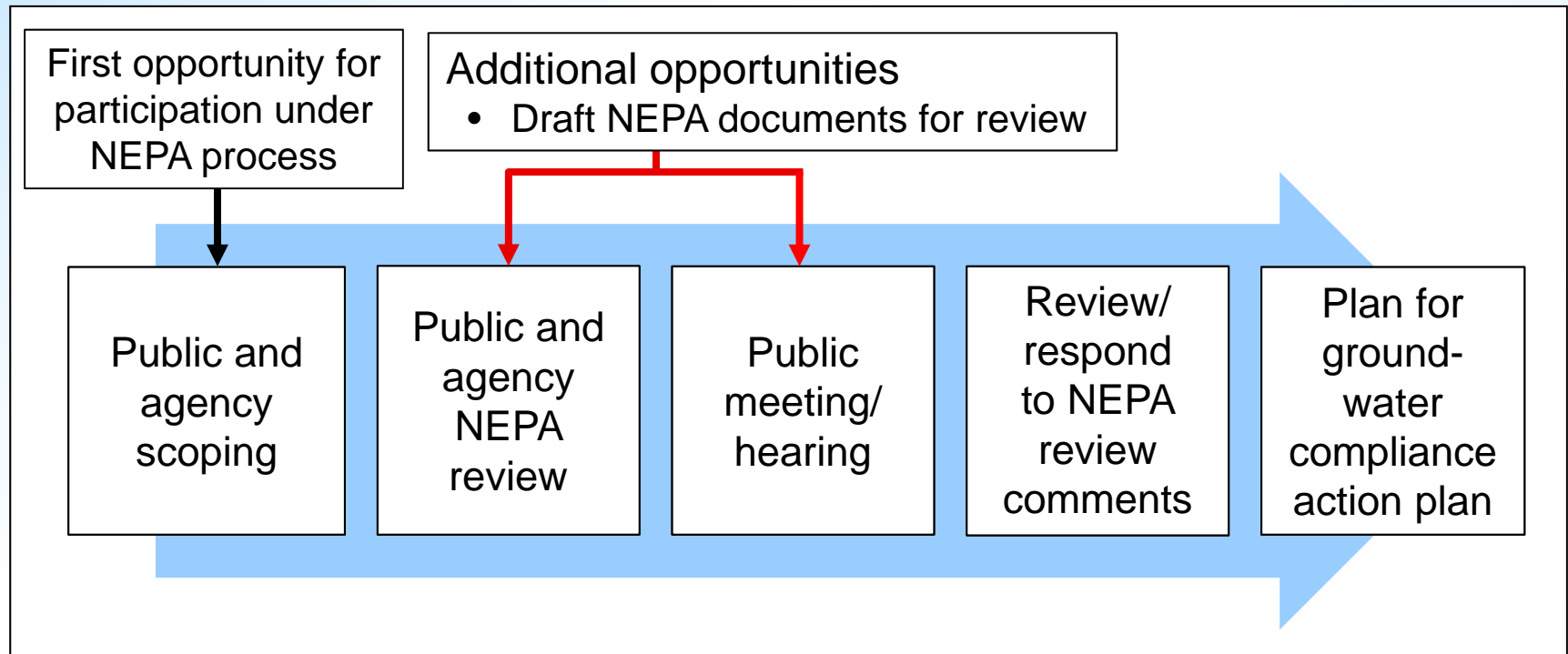
# Frequently Asked Questions

- Is the water safe for my family and my animals?
- Is my family being exposed to radiation?
- How will the land be used?
- How will the options affect the water, air, and surrounding land?



# National Environmental Policy Act (NEPA) Looking at Options

- Scoping process part of NEPA for public participation
- Best opportunity to share options and gather input
  - Input about concerns
  - Other options



# Participation with Tribes

- U.S. Department of Energy
- U.S. Environmental Protection Agency
- Bureau of Indian Affairs
- U.S. Nuclear Regulatory Commission
- Indian Health Service
- Agency for Toxic Substances and Disease Registry
- Navajo Nation Abandoned Mine Lands/Uranium Mill Tailings Remedial Action
- Navajo Nation Environmental Protection Agency
- Navajo Nation Department of Health
- Internships
  - Diné College
  - University of Arizona
- Participation at Navajo and Hopi meetings including
  - Quarterly Meetings
  - Chapter House Meetings
  - Western Agency Meetings
  - Division of Natural Resource Summit
  - Monument Valley Uranium Issues Open House
  - Festivals
  - Fairs and Conferences

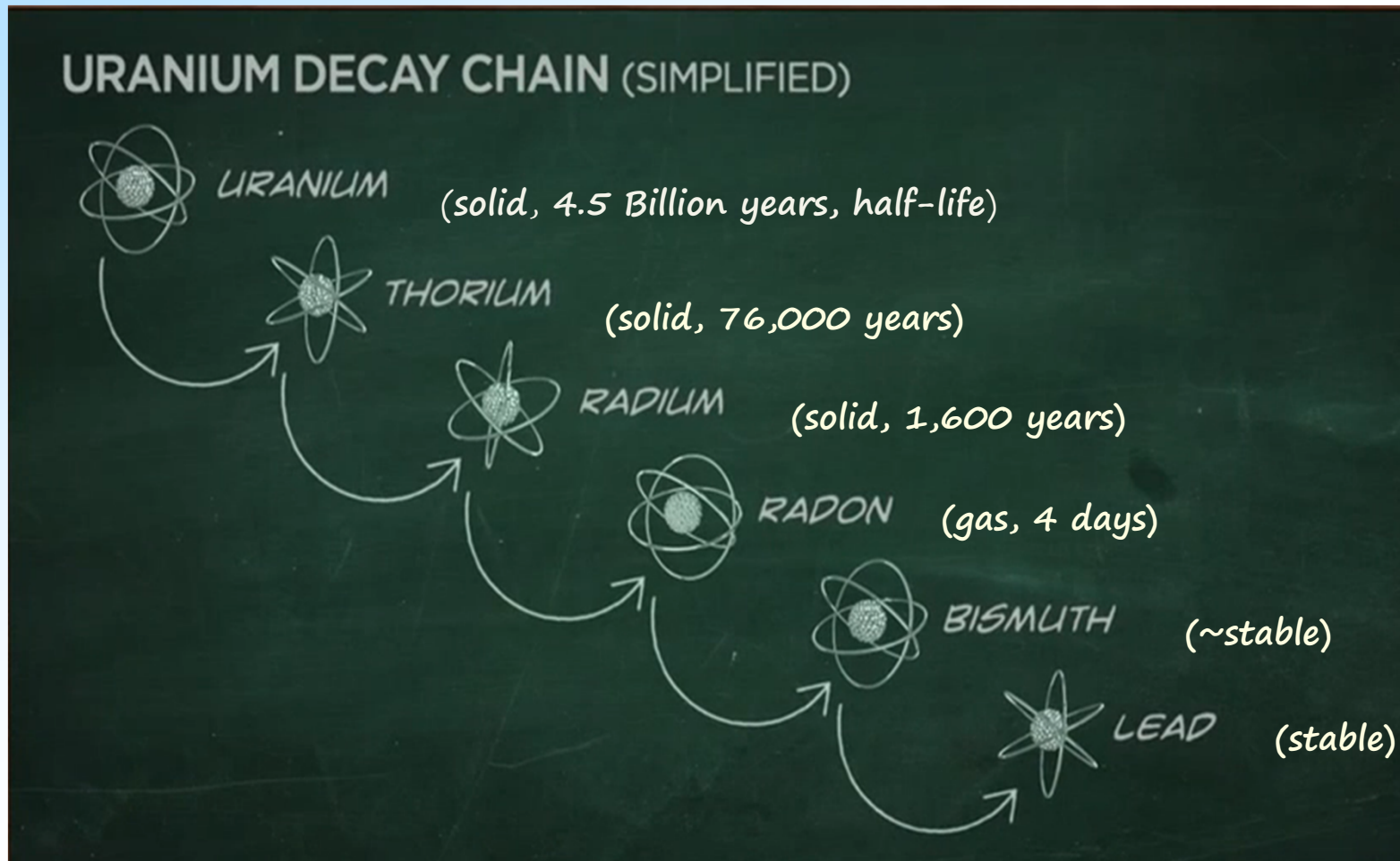


# Tuba City Site History

- Cold War legacy
  - Military veterans
  - Uranium mining and milling
- Tuba City operations
- Groundwater contamination at the site due to site operations
- Uranium Mill Tailings Radiation Control Act (UMTRCA) cleanup regulations
  - Relationship between the U.S. Nuclear Regulatory Commission and DOE

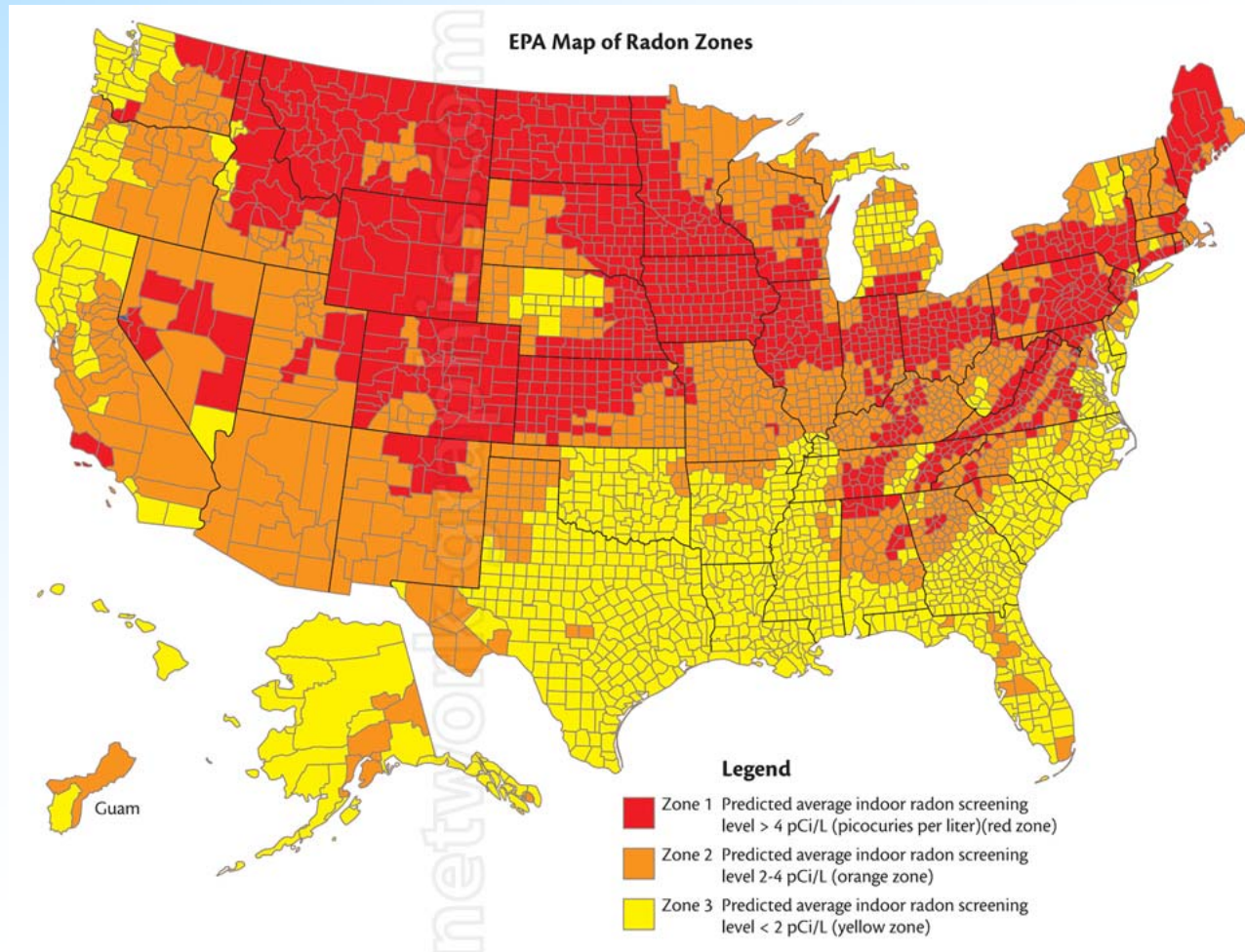


# Natural Uranium Decay





# Radon Across the United States



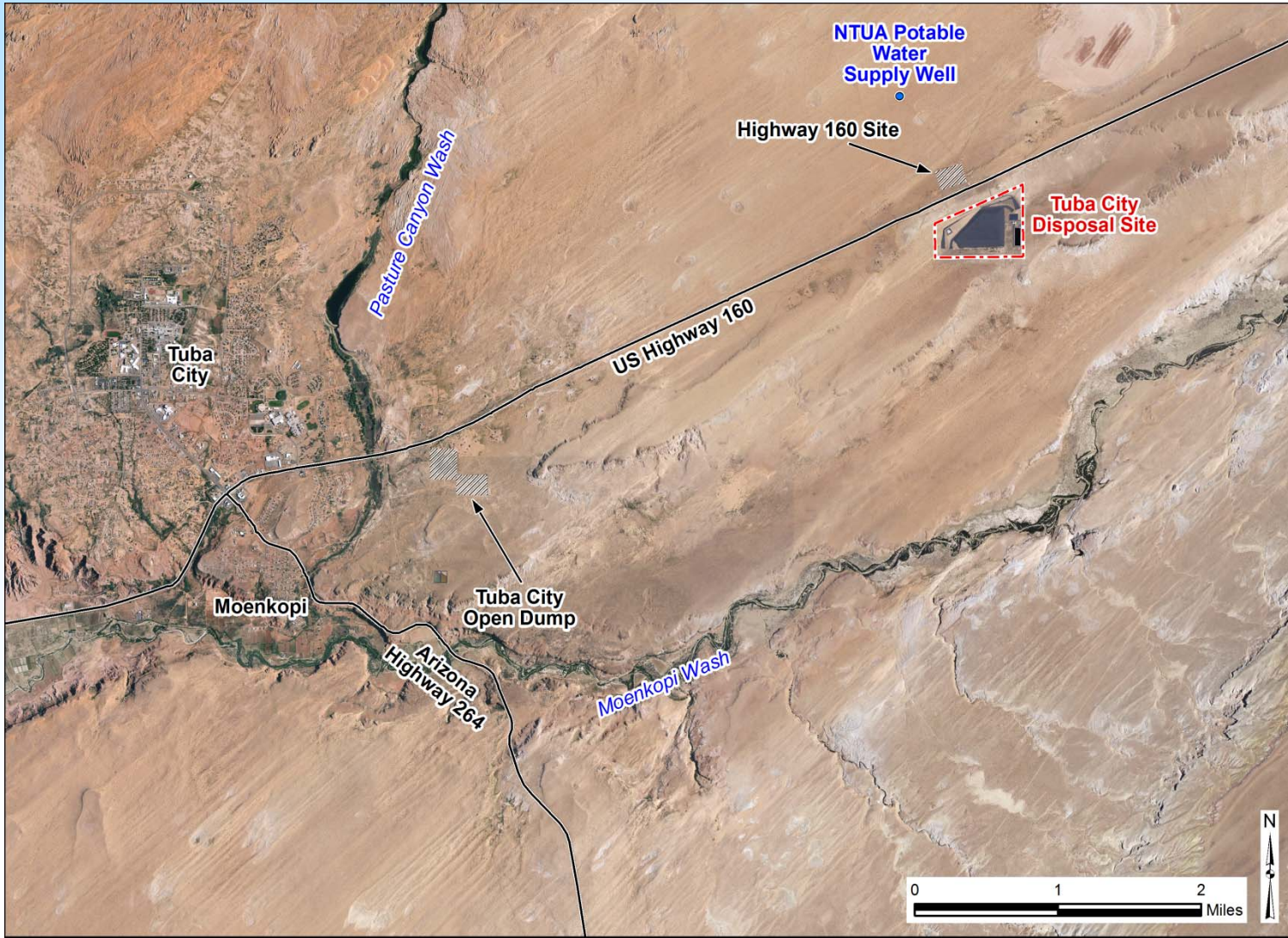
[www.epa.gov/radon](http://www.epa.gov/radon)



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# Area Map



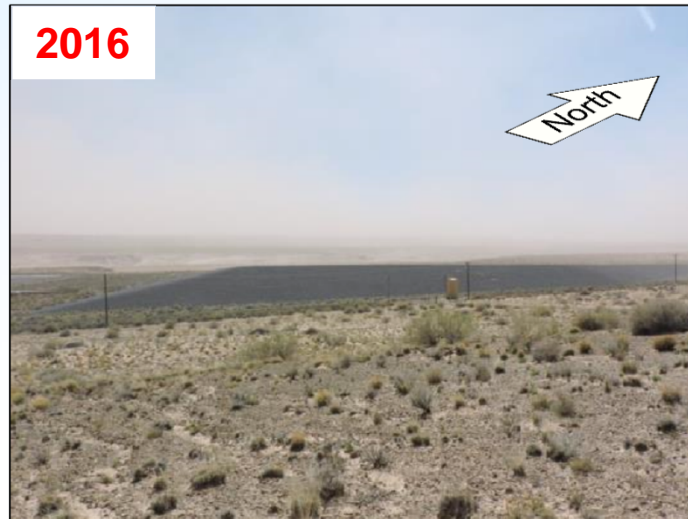
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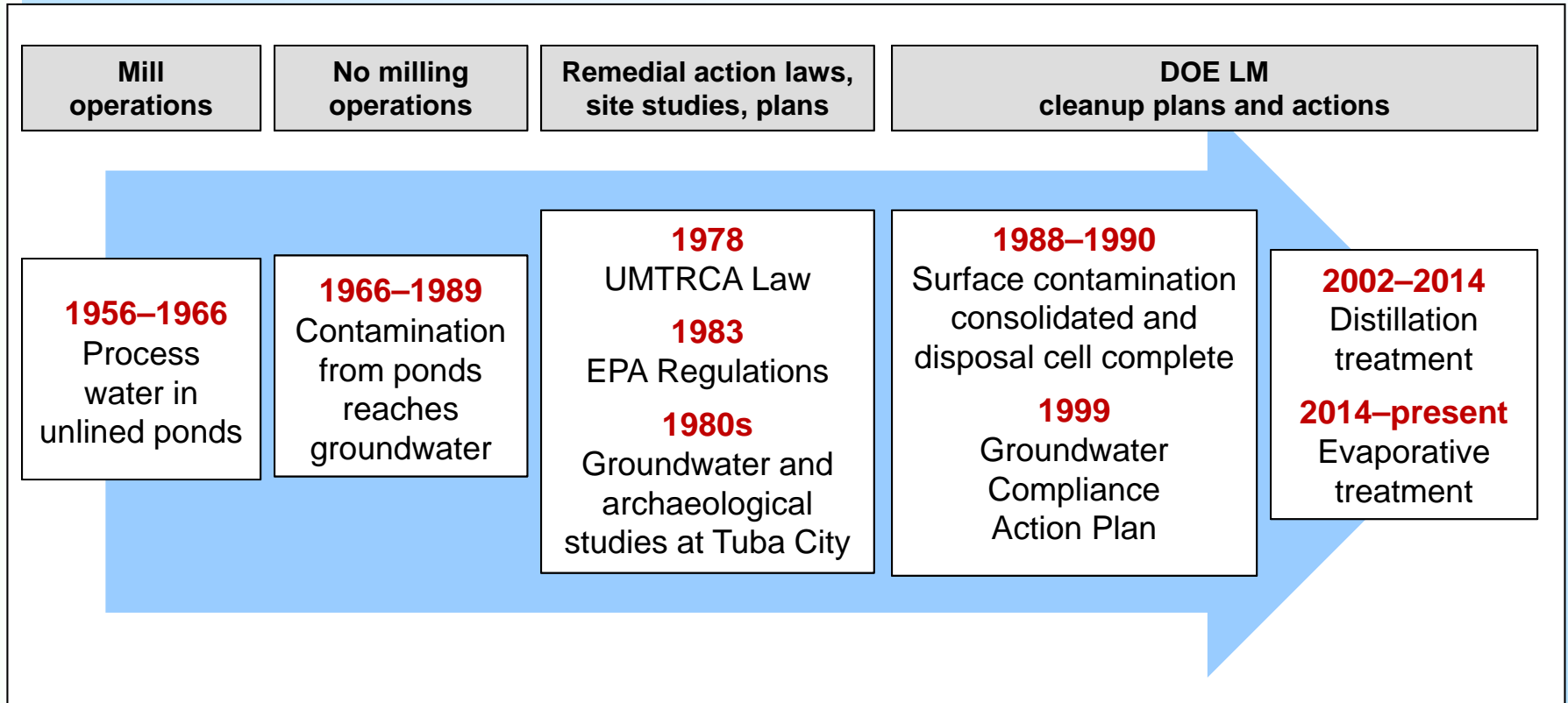
# Tuba City Site History



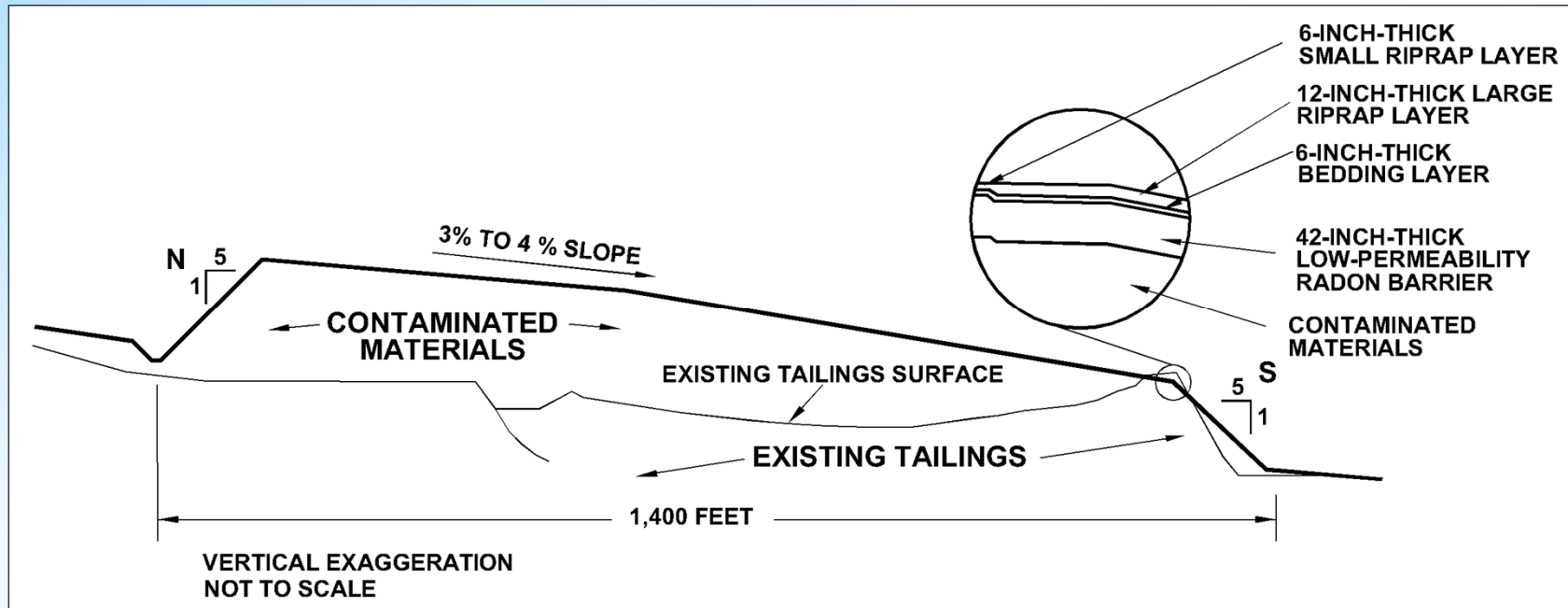
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# Site Groundwater Impacts and Cleanup Efforts



# Tuba City Disposal Cell Cross-Section



# Site Accomplishments

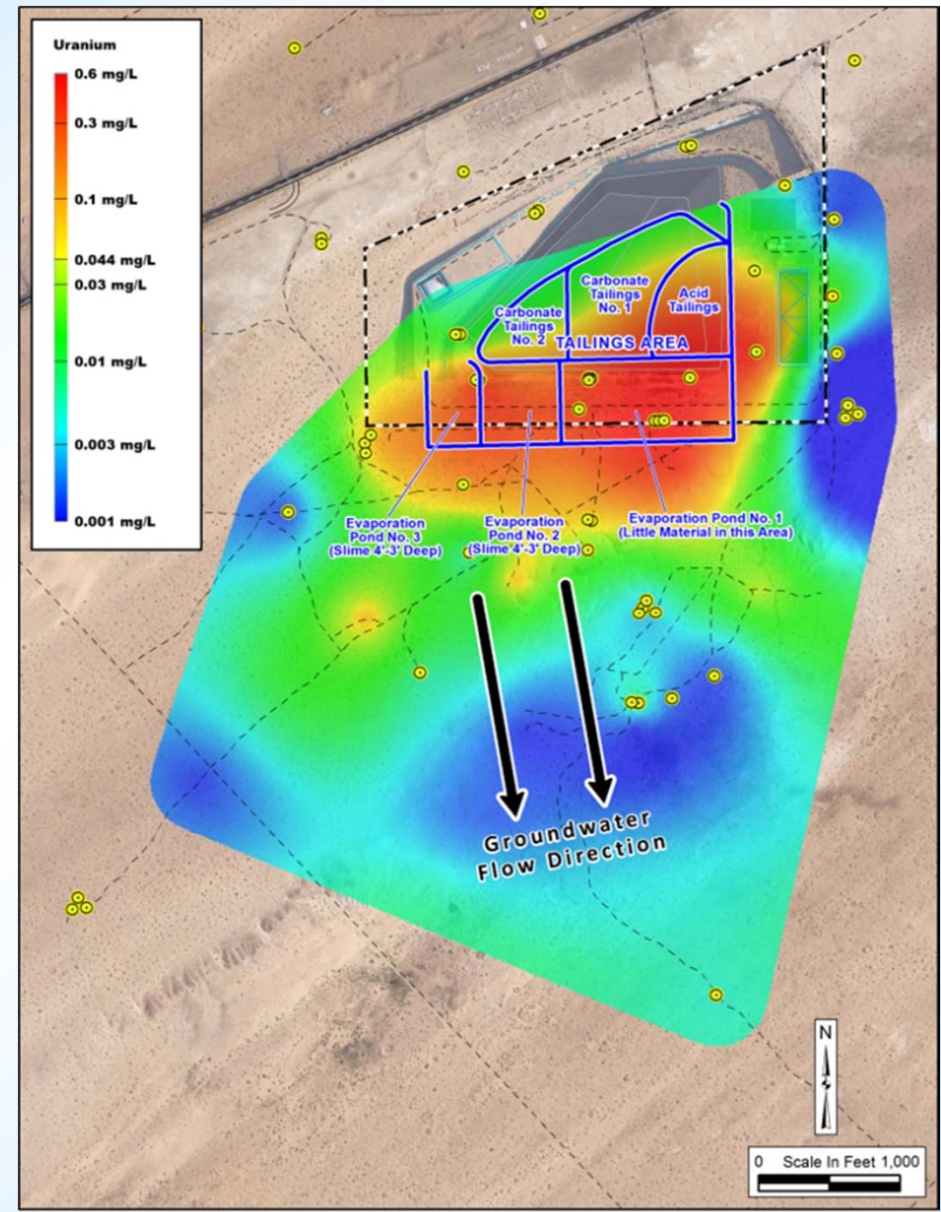
- Waste isolation completed
  - Disposal cell stopped exposure to radiation and eliminated risks from exposed tailings
  - Stopped contaminated pond water at the site from seeping into the ground
- Groundwater contamination at the site addressed through active cleanup
- Continued commitment to protect people, animals, and the environment
- Collaboration with Navajo and Hopi governments and communities



# Groundwater Contamination Stability

## Uranium plume

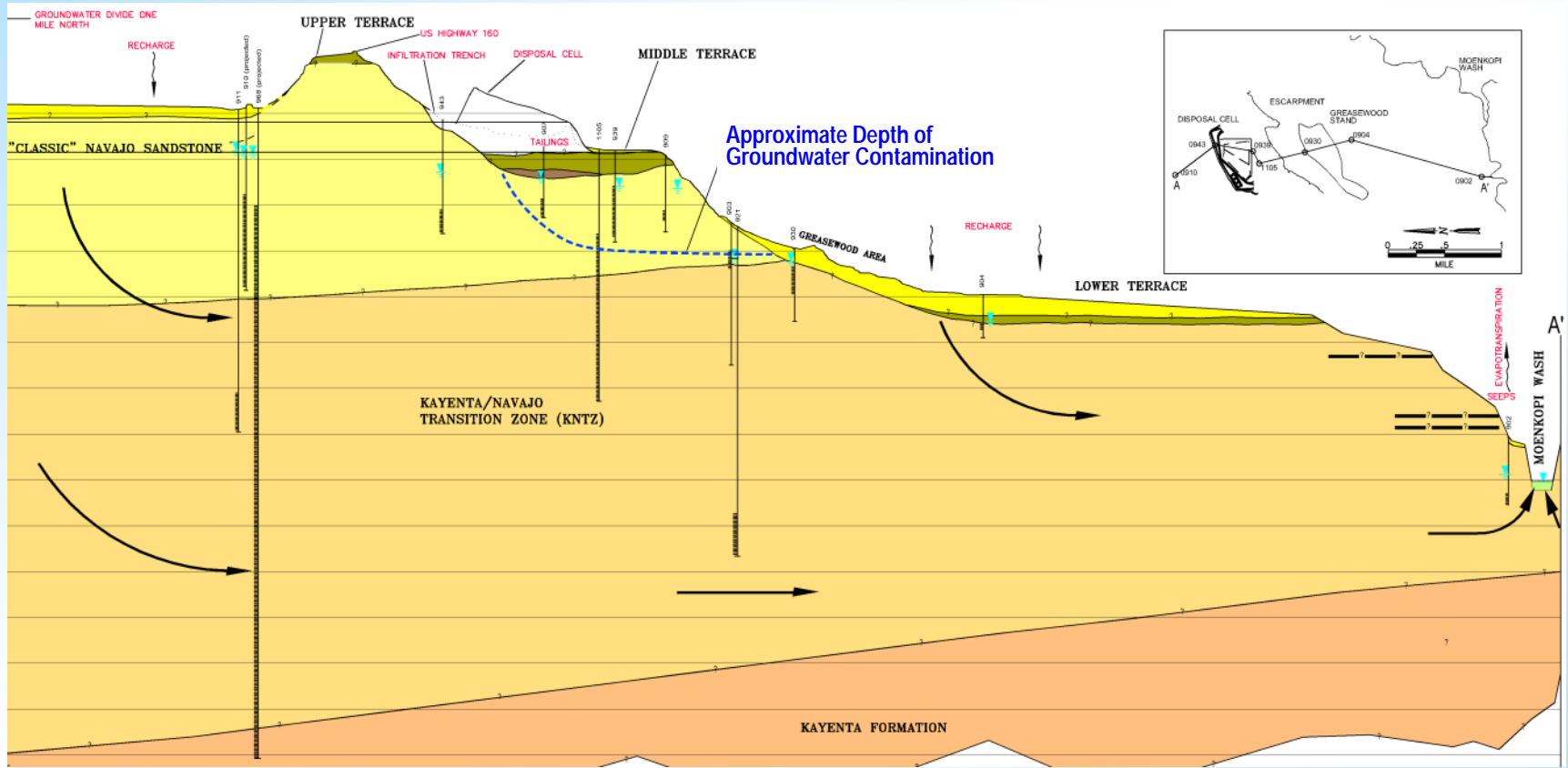
- Concentration change minimal
- Plume moving very slowly
- Still located mainly beneath the former processing site ponds
- 104 monitoring wells
  - Sampled twice per year (summer, winter)
- 37 extraction wells



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# Depth of Groundwater Contamination



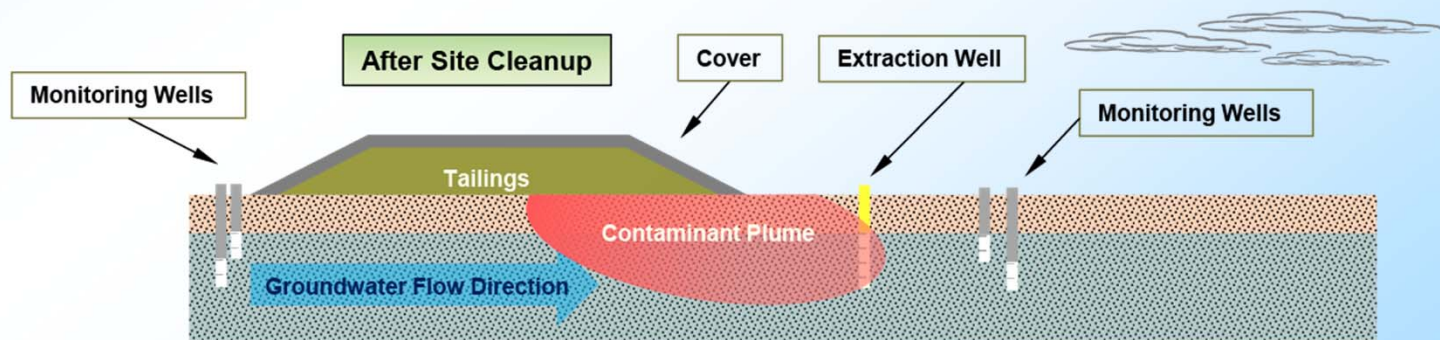
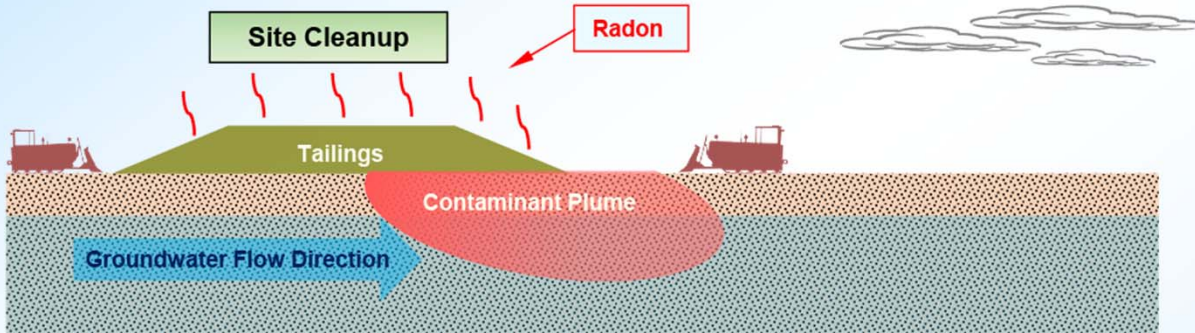
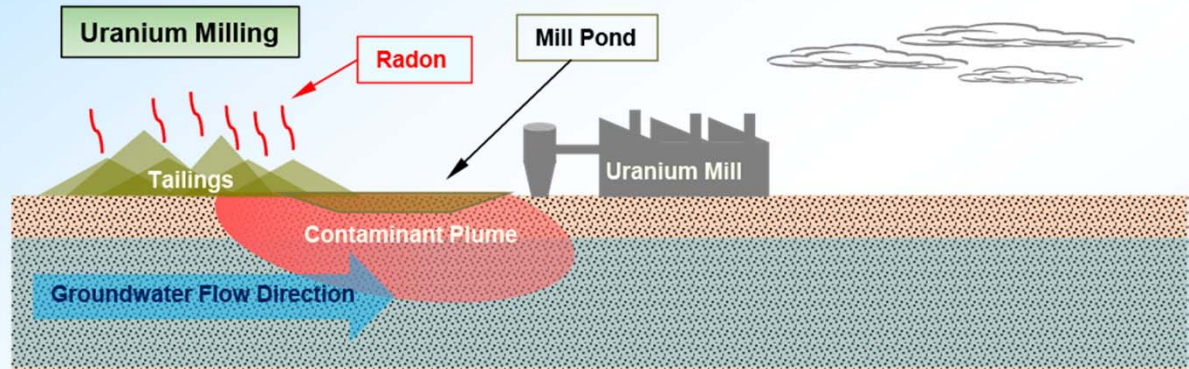


# Groundwater Flow Model

- Helps predict where groundwater will move over time
- Groundwater moving very slowly
  - Determined using 20 years of groundwater monitoring data
- Can be used to predict effects on contaminants due to pumping
  - Improve groundwater extraction strategy



# Groundwater Impact from Past Milling Operations

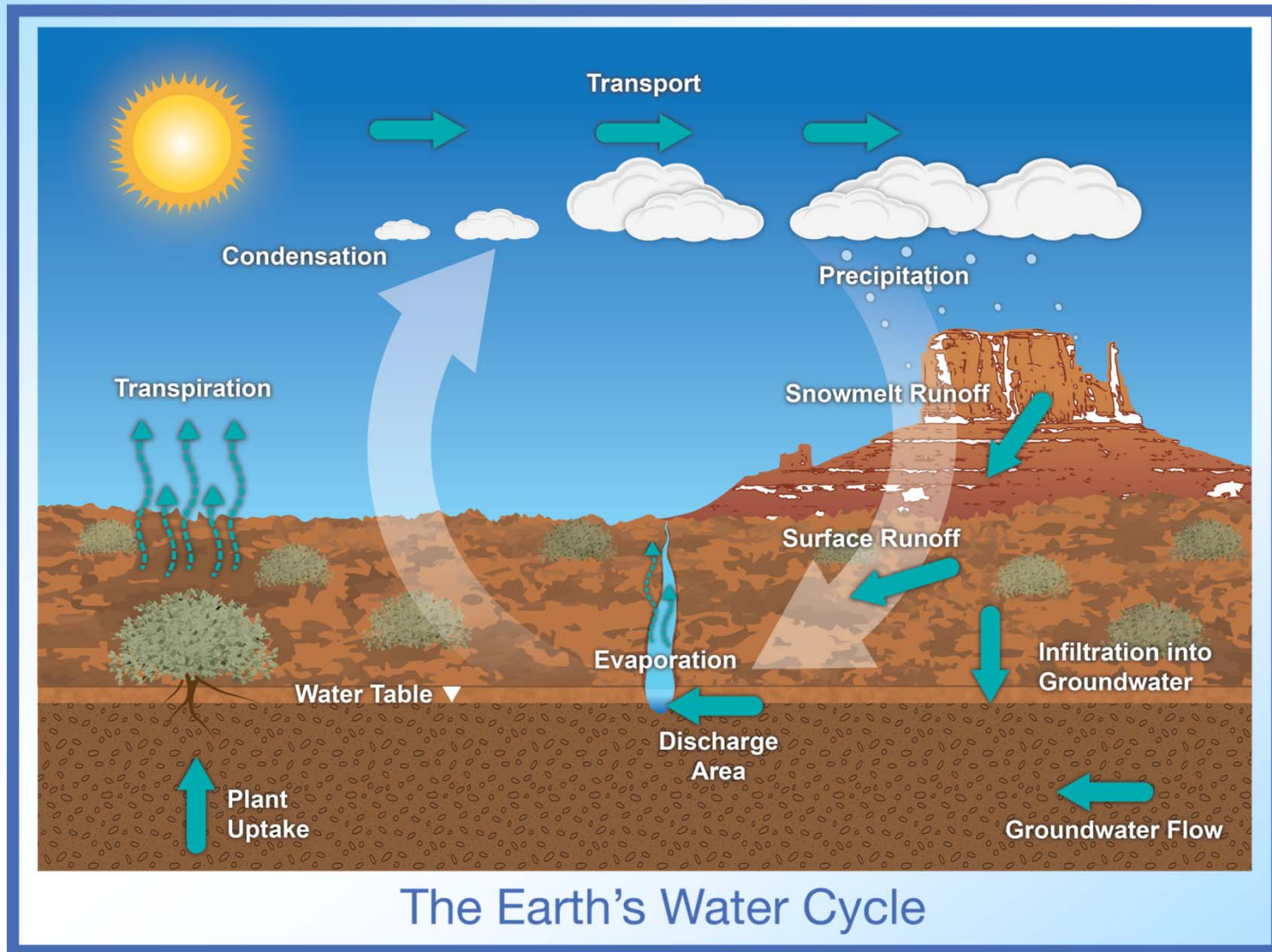


# Current DOE LM Activities to Address Groundwater Contamination

- Pumping from extraction wells to the evaporation pond
  - Approximate current pumping rate: 10 gallons per minute
    - Pumping from the most concentrated part of the plume
  - Pumping rate during summer months: 15 gallons per minute
- Almost as effective as the treatment plant for removing contaminants
- DOE LM considering options for addressing groundwater contamination



# Earth's Water Cycle



# Developing Options

- What are we trying to do?
  - Reduce risks to human health and environment
    - Meet regulatory requirements
    - Consider community's concerns
      - Moenkopi Wash important resource
- How?
  - Clean up contamination; or
  - Implement protections
- Develop options based on:
  - Community input
  - Experience, site knowledge, judgment, innovation



# Potential Options

## Option A

- No groundwater extraction
- Long-term monitoring and institutional controls
  - Protections to help prevent exposure to humans and livestock

## Option B

- Groundwater extraction
- Treatment (distillation)
- Return of treated water to aquifer

## Option C

- Groundwater extraction
- Treatment (filtration)
- Return of treated water to aquifer

## Option D

- Groundwater extraction
- Evaporation of water from the pond

All options included long-term monitoring and measures to prevent exposure to humans and livestock.



# Long-Term Monitoring with ICs

## ■ Options include

- Long-term monitoring
  - Groundwater sampling and analysis
    - Compliance wells
      - Used to ensure appropriate water quality standards are met (where in use)
    - Agricultural-use wells
      - Used to meet Navajo Nation standards where livestock are present
    - Sentinel wells
      - Used to show how groundwater is moving (allows LM to see if additional action is needed)
  - ICs
    - No groundwater use on the middle terrace
    - Groundwater can be used for agricultural purposes on the lower terrace

## ■ Authority and responsibility for ICs



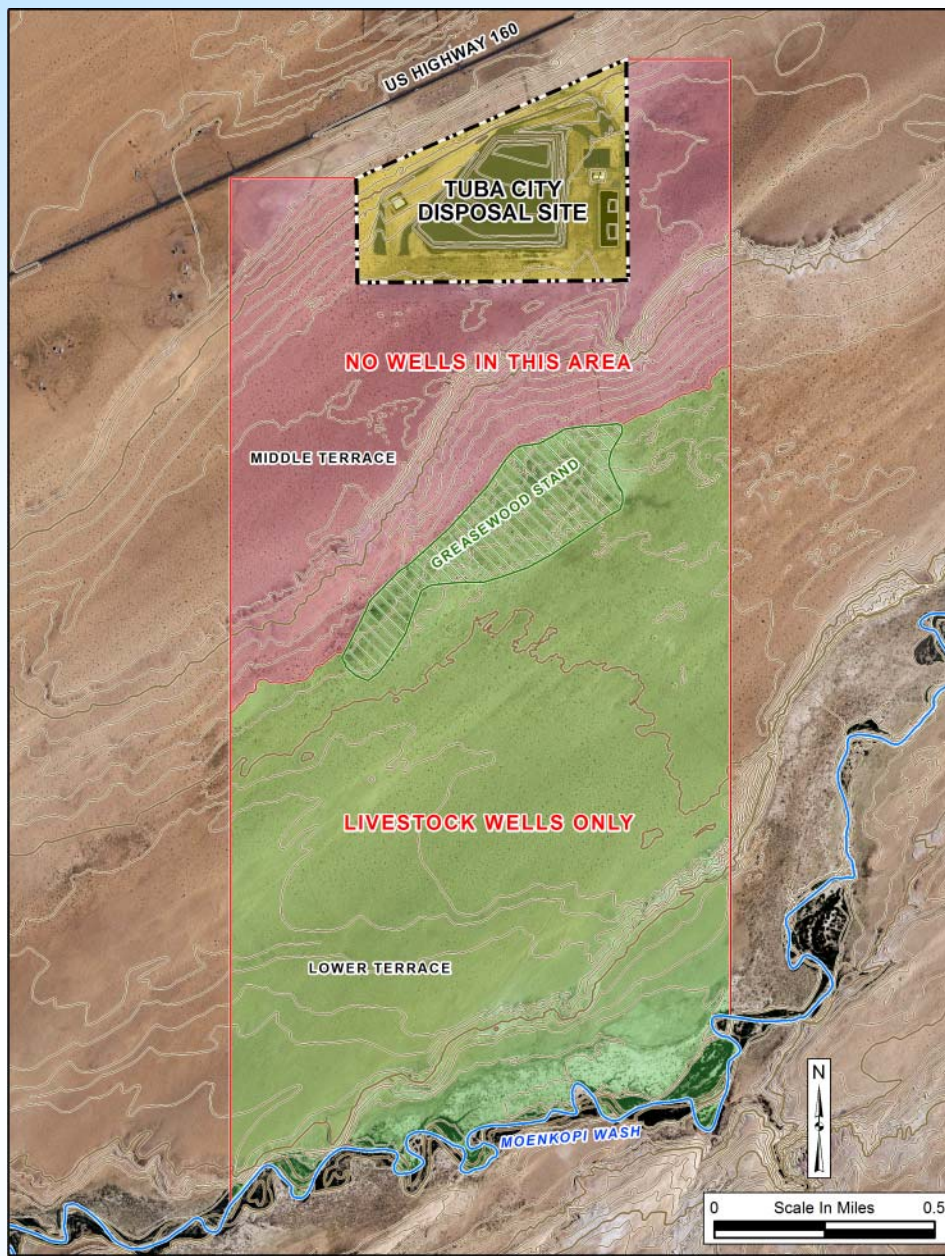
# ICs Considered for Tuba City

- ICs used where contaminated water is present
  - Control areas determined by sampling and modeling results
  - Navajo Nation helping DOE LM keep people and animals safe
- Examples:
  - Land use restrictions (preserve greasewood stand on middle terrace)
  - Limited use of groundwater (livestock watering on lower terrace)
- ICs successful at many sites





# Proposed ICs Area



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## *Option A – Pros and Cons*

# Long-Term Monitoring with ICs

### ■ Pros

- Effective long-term monitoring and ICs are already in place
  - Monitoring wells and site fence
    - Sampling will provide early detection of any plume movement that would require a change in strategy
    - Fence line is close to the contaminated area; minimizing use restricted area
    - Proposed ICs will not impact current use
  - Area is not currently grazed and there are no wells
- Water stays in the ground; no evaporation loss, and presents no increased risk to health or environment

### ■ Cons

- Contamination is not removed
- Monitoring may reveal need for future action; must maintain some capability to pump and treat
- No new employment opportunities



## *Option B – Pros and Cons*

# Restart Distillation Treatment System

### ■ Pros

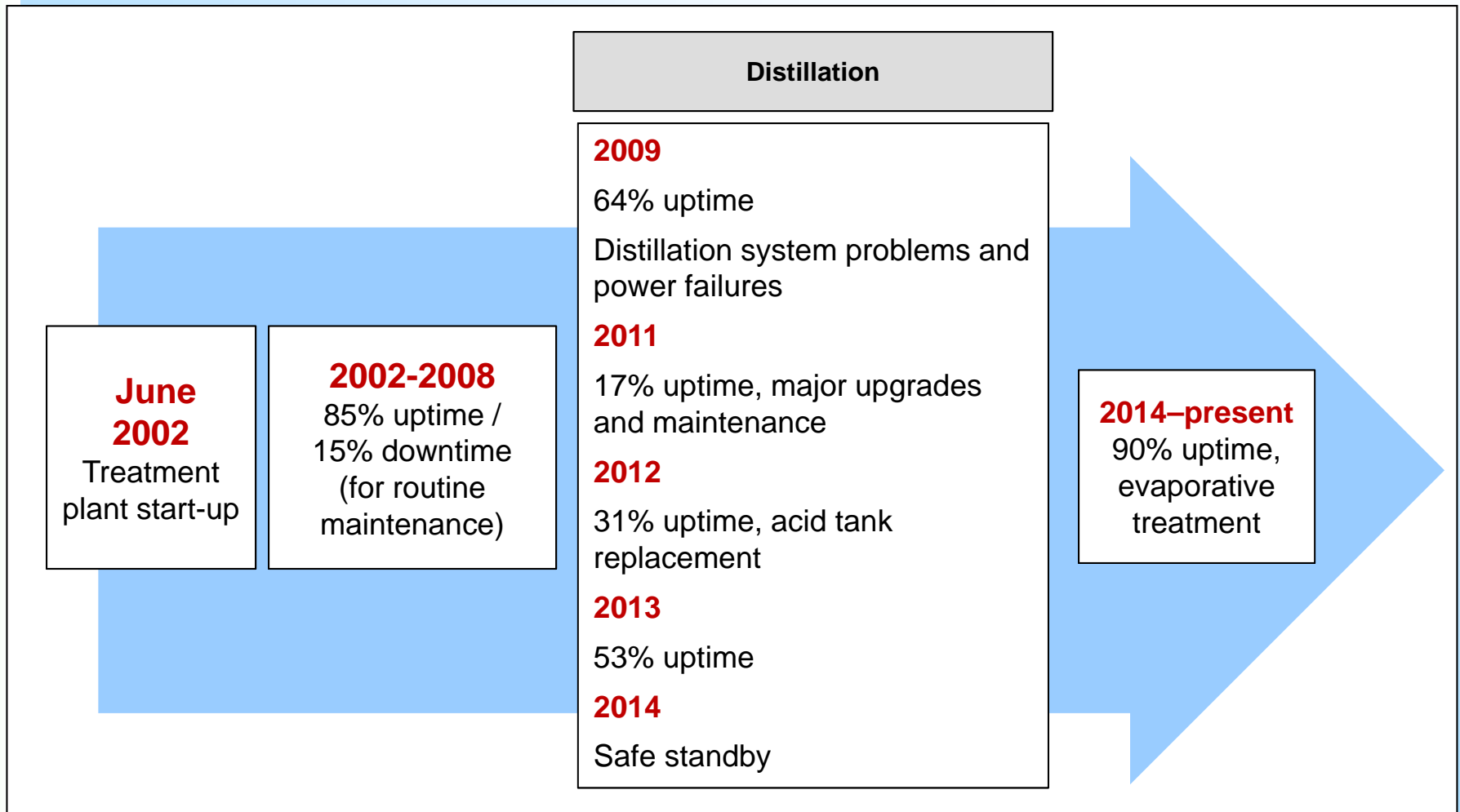
- Returns treated water to aquifer
- Sends smallest amount of wastewater to evaporation pond
- New employment opportunities (more operators needed)
- Restart *might* be accomplished in less time than getting a new treatment system installed

### ■ Cons

- Risk to operators and environment; hazardous chemicals needed for operation
- Existing equipment is difficult to operate and may have to be replaced
  - Does not run well if flow rate changes
  - Outdated, difficult to get replacement parts
  - Oversized
- Greater complexity than Options C and D, to achieve the about same amount of contaminant removal



# History of Groundwater Treatment Operations



## *Option C – Pros and Cons*

# Start a New Filtration Treatment System

### ■ Pros

- Returns treated water to aquifer
- Sends small amount of wastewater to evaporation pond
- Expected to run better (by design, better understanding of groundwater quality, experience)
- New employment opportunities (more operators)

### ■ Cons

- Risk to operators and environment; hazardous chemicals needed for operation
- May require a longer time to get started, design, purchase, install
- Greater complexity than option D to achieve the same amount of contaminant removal
- Years of continuing operation may result in no change in contaminant concentrations



## *Option D – Pros and Cons*

# Remove Contamination from Groundwater and Collect it in the Evaporation Pond

### ■ Pros

- Extracts contamination from groundwater and collects in evaporation pond
- Long-term sustainability; easy to operate and maintain
- Minimum risk to operators and environment
- Equipment and pond are already installed and operating

### ■ Cons

- Sends more water to the evaporation pond; may require additional pond or enhanced evaporation to operate at required flow rate
- Does not return treated water to the aquifer
- Limited employment opportunities



# Next Steps

- Comments and questions will be reviewed
- LM will consider and respond to comments or questions received
- Please see the LM website for information on Tuba City  
<http://www.lm.doe.gov/tuba/Sites.aspx>



# How You Can Provide Input

- Verbal comments gathered at this meeting
- Comment cards available for written comments
- Email: [TubaCityComments@lm.doe.gov](mailto:TubaCityComments@lm.doe.gov)
- Mail: U.S. Department of Energy  
Office of Legacy Management  
Tuba City Groundwater Compliance Comments  
2597 Legacy Way  
Grand Junction, CO 81503
- Phone: (866) 559-8316 (toll-free)
- Fax: (970) 248-6040
- Web: <http://www.lm.doe.gov/tuba/sites.aspx>

