Underground Test Area (UGTA) Sub-Project at the Nevada Test Site

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Nevada Test Site (NTS)

- Approximately 1,375 square miles of federally owned and controlled land – surrounded by approximately 4,500 square miles of federally owned and controlled land

- Located approximately 65 miles northwest of Las Vegas
UGTA Sub-Project Background

- 828 underground nuclear tests released 132 million curies directly into the subsurface environment, including the aquifers, at the NTS
UGTA Sub-Project Mission

- Objectives: Define corrective action unit-specific contaminant boundaries to assess the present and future migration of radionuclides from underground testing on the NTS and potential risk to the public

- Regulations: Federal Facility Agreement and Consent Order with the State of Nevada Division of Environmental Protection (NDEP)
  - Protection Basis: protection of the public under the Safe Drinking Water Act (SDWA)
Major Steps in the UGTA Strategy

- Develop regional models of groundwater flow
  - Death Valley Regional Groundwater Flow system
- Identify Corrective Action Units for characterizing areas grouped by geography and hydrogeological setting
  - Remediation is cost-prohibitive
- Develop flow and transport models for each corrective action unit
  - Used to forecast contaminant boundaries for the next 1,000 years
- Monitoring to test modeling forecasts
  - Build confidence in models results for regulatory decisions
- Negotiate compliance boundaries with NDEP
  - Define area for long-term monitoring program and protection of public
UGTA Regional Model (1997)

Western and Central Pahute Mesa

- 75 Corrective Action Sites (CASs)
- Approximately 61% of underground inventory
- Nine (9) new wells to be drilled between FY 2009 and FY 2011
  - Computer models predict radionuclide transport off the NTS
  - Phase II data collection will help refine model output
Frenchman Flat

- 11 CASs
- Less than 1% of the underground inventory
- Phase II transport model to NDEP for review in September
- Begin preparing for independent peer review in FY 2010

UGTA Monitoring Well UE-5n
Yucca Flat  
(Climax Mine and Yucca Flat)

- 717 CASs
- Approximately 39% of underground inventory
- Completed the unclassified Source Term Data Document in June 2009
Rainier Mesa / Shoshone Mountain

- 60 CASs on Rainier
- Six (6) CASs on Shoshone Mountain
- Less than 1% of the underground inventory
Risk Perspectives / Public Protection

- **UGTA Risk:** Public exposure to contaminated groundwater

- Standard risk equation, \( \text{Risk} = H_P \times C_h \), where \( H_P \) is the probability of a hazard and \( C_h \) is the consequences of a hazard

- Risk equation translated to the UGTA decision problem
  - \( H_P \) is probability of contaminated groundwater (greater than the Safe Drinking Water Act of 1974)
  - \( C_h \) is consequences of exposure to contaminated groundwater (dose exposure scenario)
Risk Perspectives (continued)

- $H_p$ is established by model forecasts which define the contaminate boundary
- $C_h$ can be controlled by land-use restrictions that limit public access to groundwater (reduced probability that the exposure scenario occurs; SDWA assumes $P = 1$ that exposure occurs)
Tripartite Closure Strategy
Risk-Informed Strategy

Modeling

Institutional Controls

Protecting the Public

Monitoring
UGTA Summary

- UGTA is aggressively moving forward in all CAUs

- UGTA continues to work closely with all stakeholders; Citizens Environmental Monitoring Program; Community Advisory Board and NDEP