Status of the Repository at Yucca Mountain

Presented to:
DOE-EM Performance Assessment Community of Practice Technical Exchange Meeting

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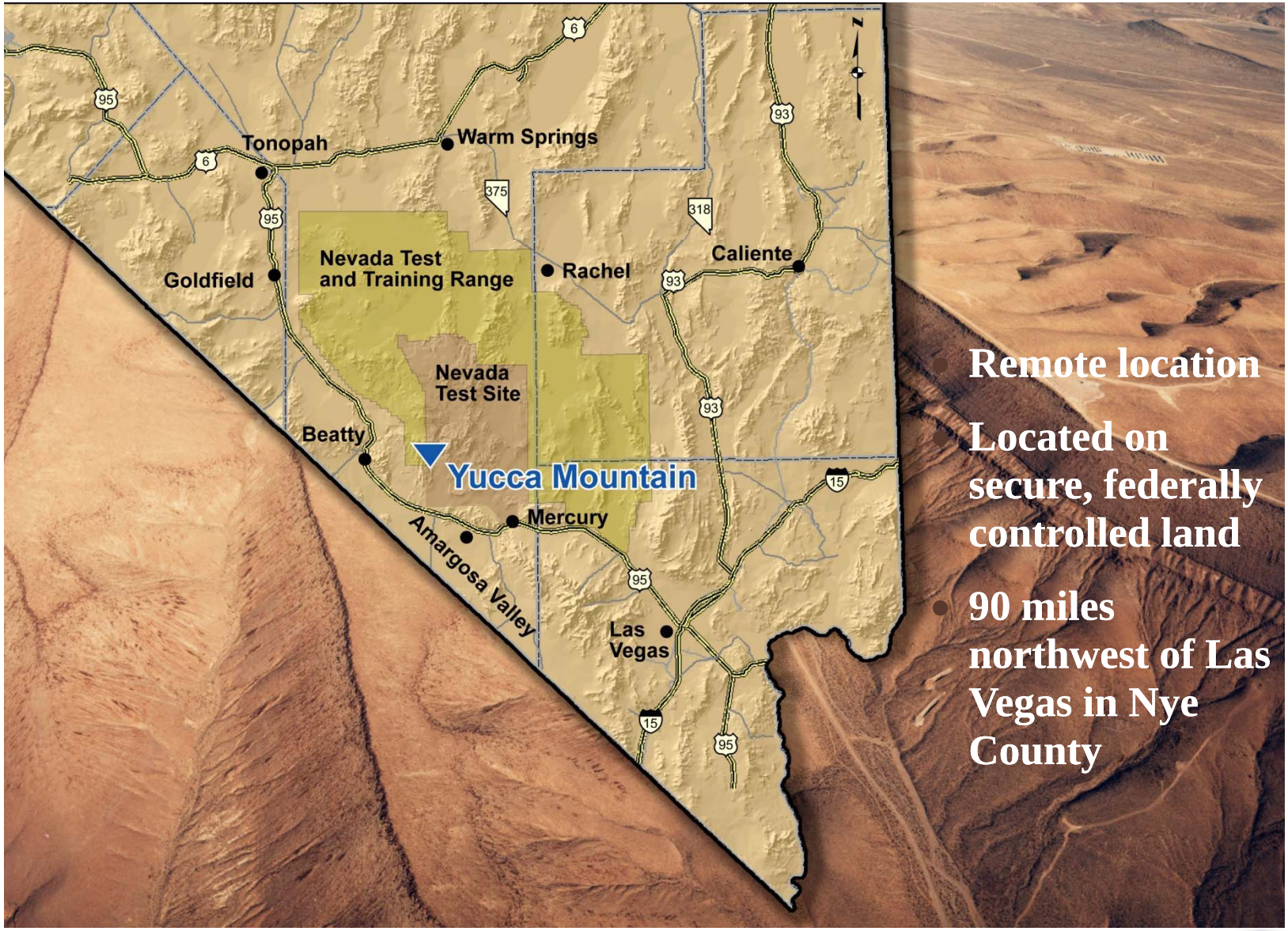
Outline

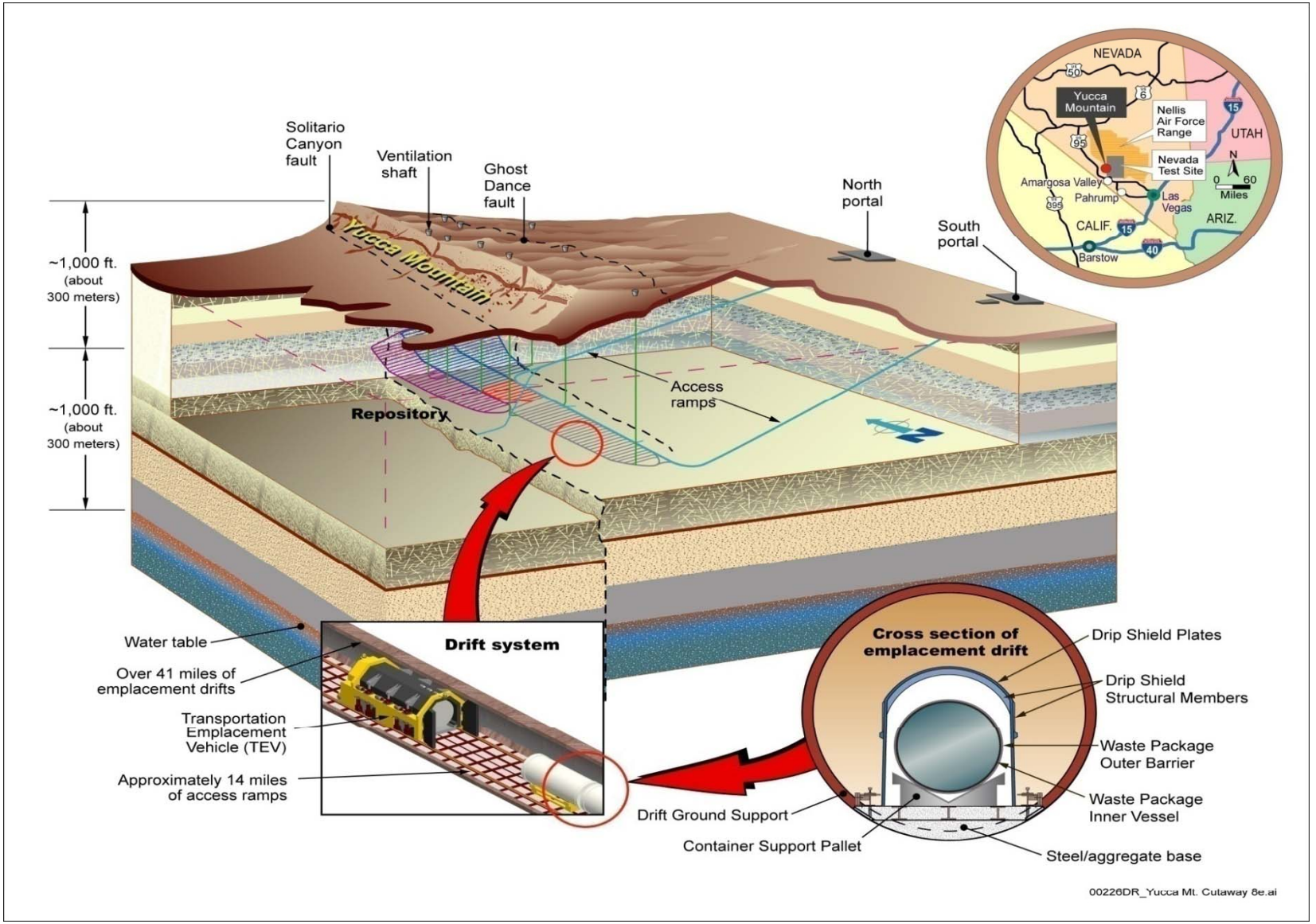
- **Science and Regulatory Background Information**
- **Status of Yucca Mountain License Application**
- **Q & A**

Yucca Mountain, Nevada



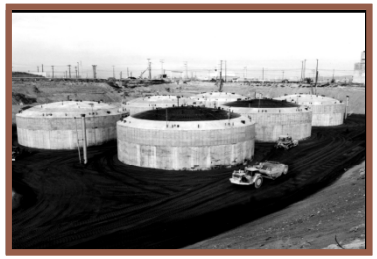
- Remote location
- Located on secure, federally controlled land
- 90 miles northwest of Las Vegas in Nye County

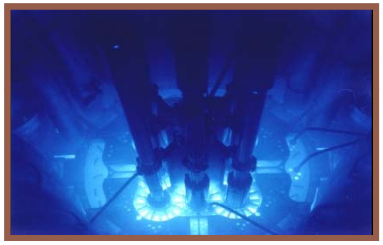
Combined Geologic/Engineered System at YM



Expected inventory of waste to be received

The expected waste stream as set forth in the license application per the amended NWPA of 1987:





Waste Type	Assemblies/Canisters	Metric Tons of Heavy Metal (MTHM)
Commercial Spent Nuclear Fuel (CSNF)	~221,000 / 7,500*	63,000
Commercial High Level Waste	275	
Defense High Level Waste	~9,300	4,667
DOE Spent Nuclear Fuel	~3,500	2,268
Naval Spent Nuclear Fuel	400	65
Total		70,000

****Transportation, aging, and disposal canisters (TADs)***

Note: ~50% of the DHLW and DOE SNF is orphaned by the amended NWPA of 1987

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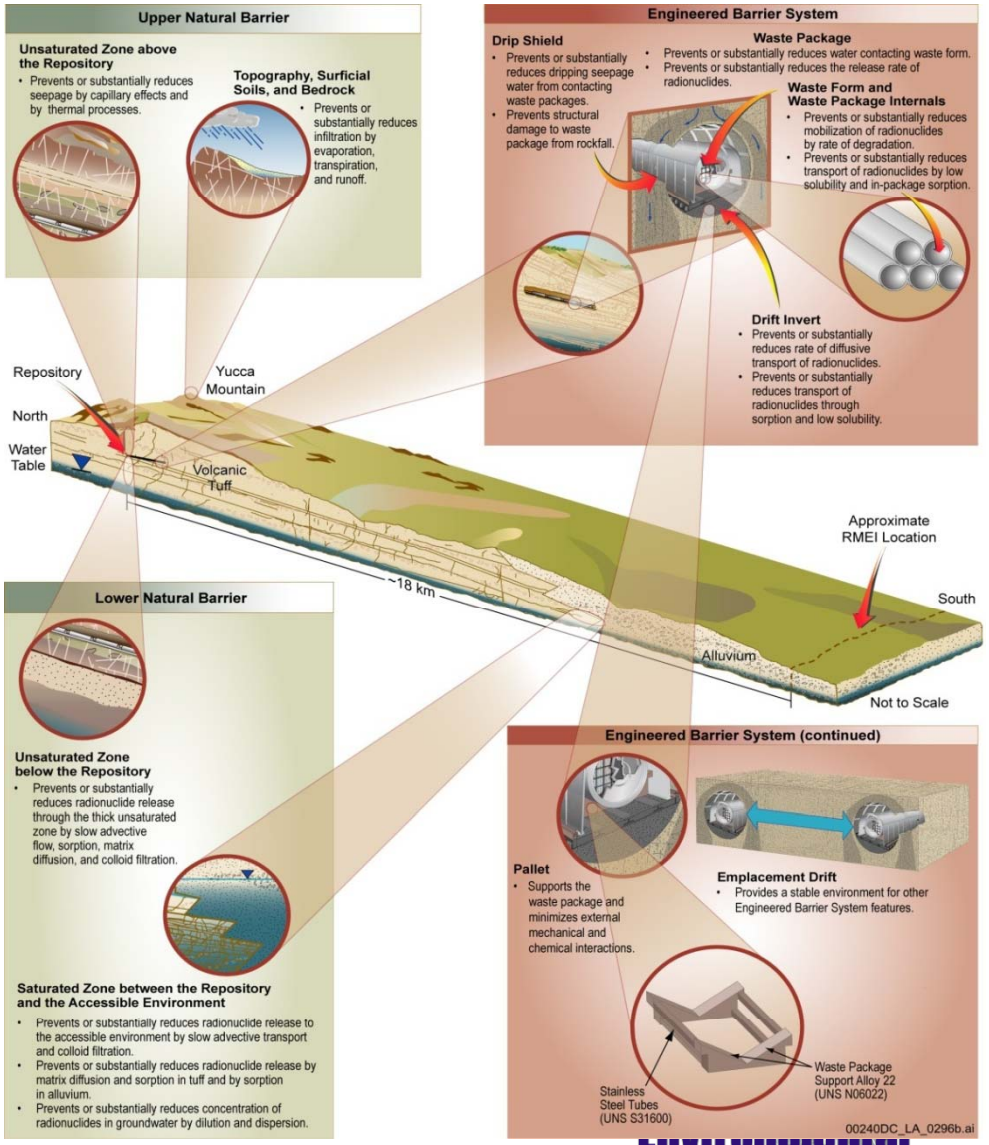
Regulatory Requirements in 10 CFR 63

- **Mean dose limit is 15 mrem/yr for 10,000 years**
- **From 10,000 to 1 million years, the mean dose limit is 100 mrem/yr**
- **Dose to be calculated for reasonably maximally exposed individual (REMI) defined in regulation**
- **Mean values of current lifestyle and diet; drinks two liters/day of groundwater**
- **Groundwater radioactivity concentration determined by dissolving annual contaminant quantity into a water demand of 3,000 acre-feet**
- **Need to consider features, events and processes (FEPs) more likely than 1 in 10,000 in 10,000 years ($>10^{-8}$ per year frequency) with some exceptions specified by regulation**

FEP's (Features, Events and Processes)

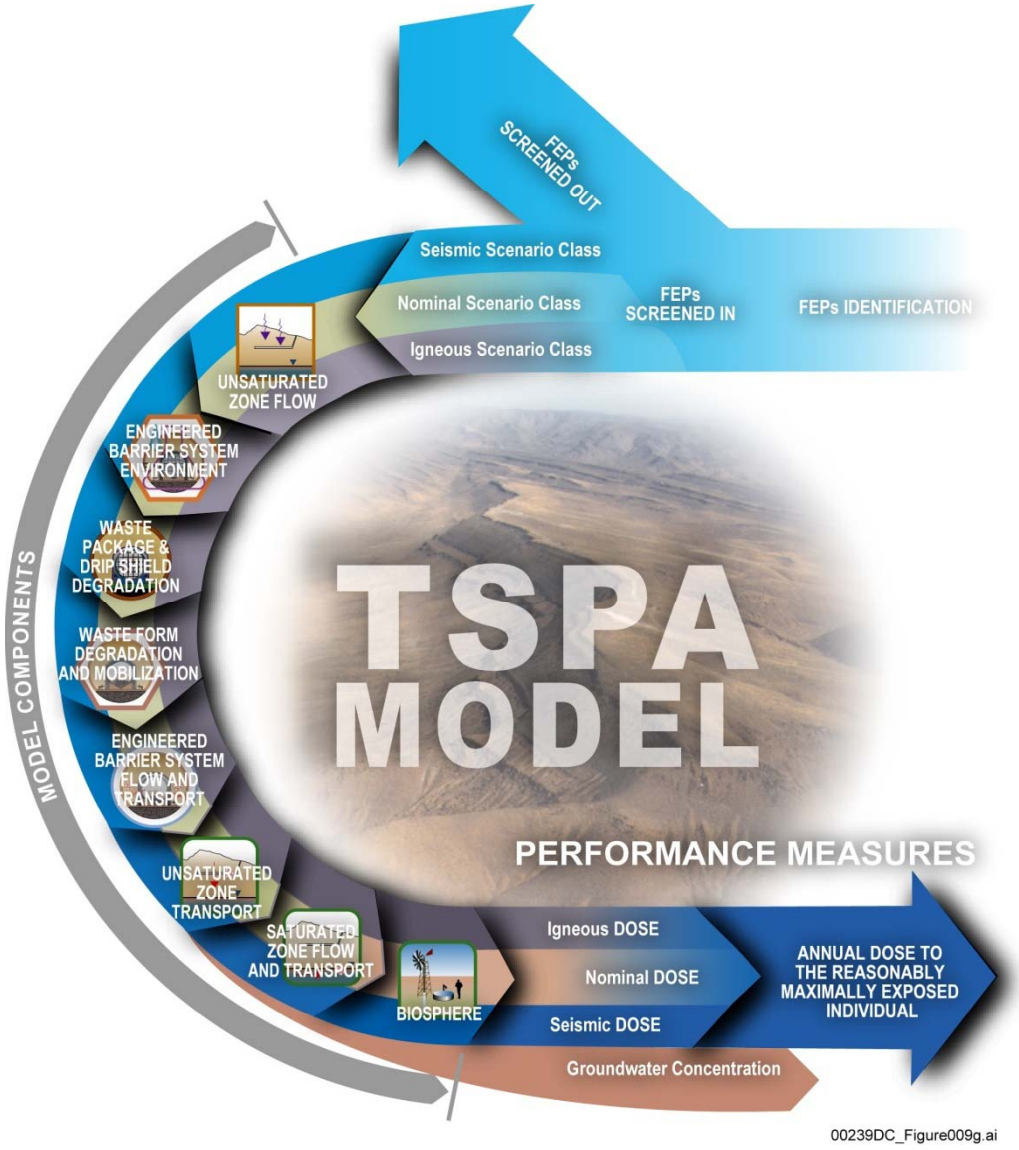
- **FEP's areas:**
  - **Surface soils and topography**
  - **Unsaturated zone above the repository**
  - **Drip shield**
  - **Waste package**
  - **Cladding**
  - **Waste form**
  - **Invert**
  - **Unsaturated zone below the repository**
  - **Saturated zone**



Risk-based Dose Criterion

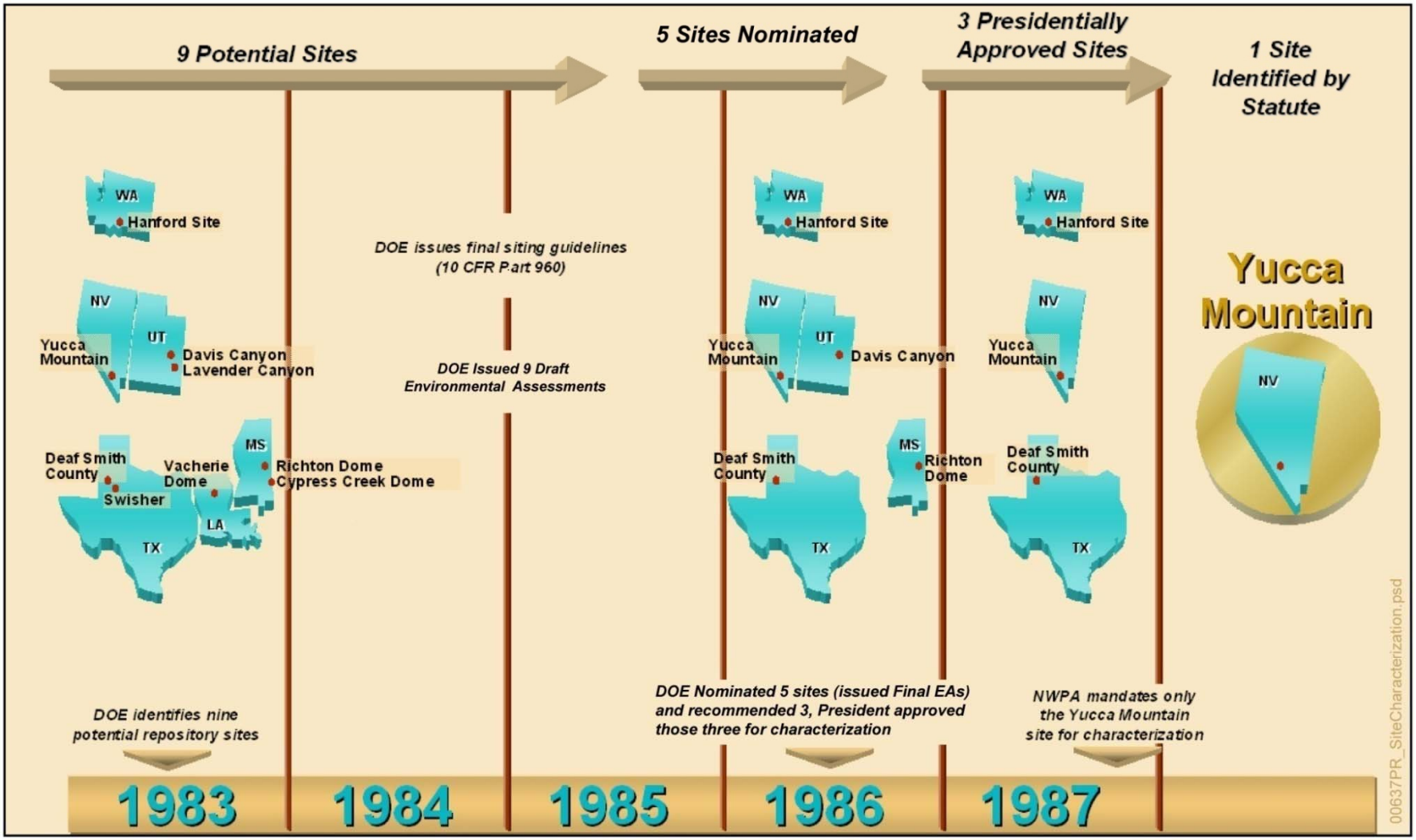
- **A risk-based dose criterion for YM as the primary regulatory performance measure requires the Total System Performance Assessment (TSPA) to be probabilistic**
- **Mean annual calculated dose is the sum of mean annual doses for three different scenario classes conditioned by the likelihood of that scenario class, likelihoods for all scenario classes sum to one**
- **Regulators determine the risk–to-dose formulation that is to be assumed, so calculations of dose are relatable to risk.**
- **The TSPA is a method for providing quantitative estimates of future system performance, considering uncertainties and includes:**
  - **Consequences weighted by probability (i.e., regulate on risk)**
  - **Account for uncertainties (regulate on mean risk but account for all uncertainty)**
  - **Monte Carlo uncertainty analysis of all three scenarios**

TSPA predicts future repository performance

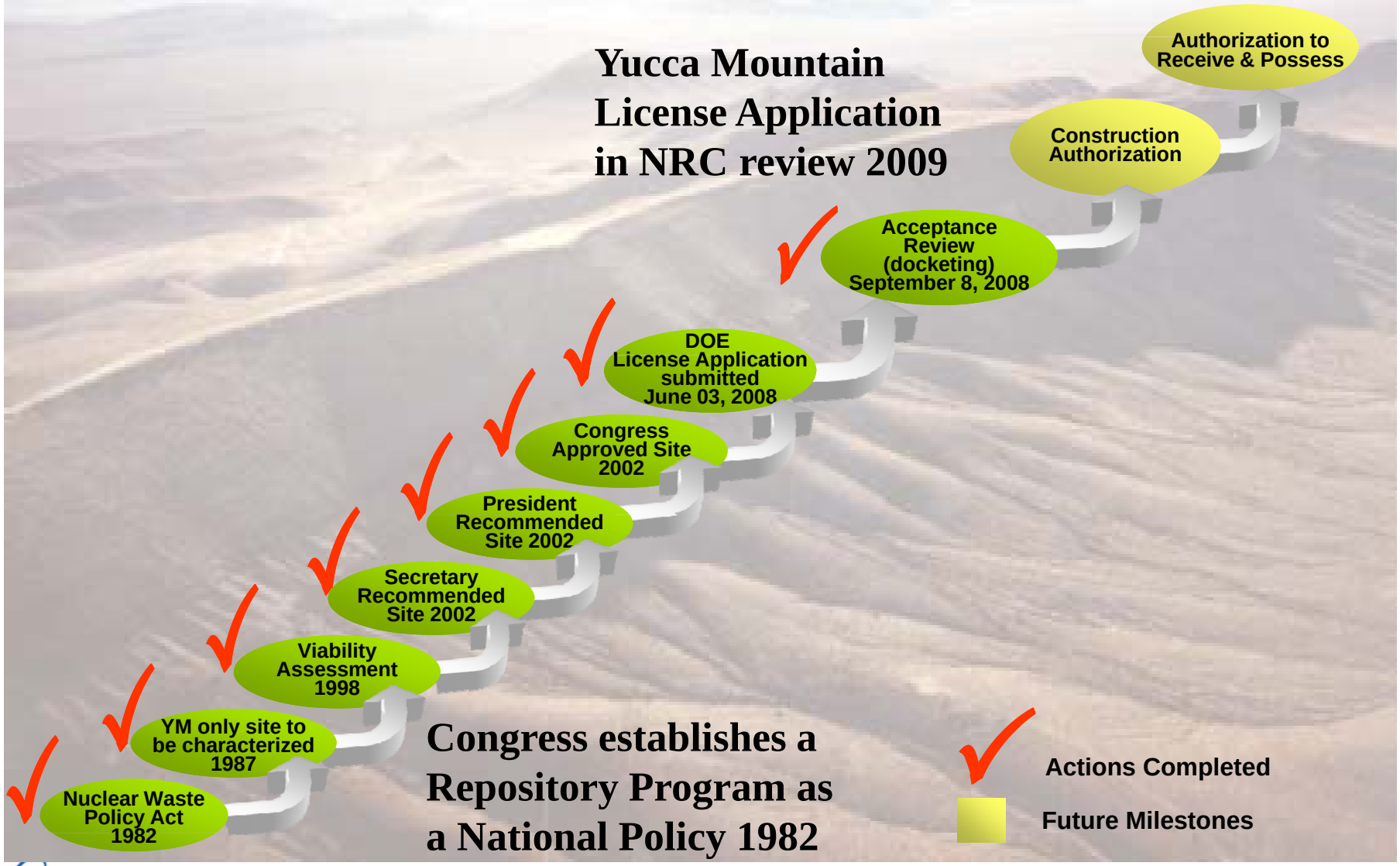


Status of Yucca Mountain License Application

History of site characterization studies and the site selection process



Yucca Mountain Milestones



Status of the Yucca Mountain License Application NRC Review

- **NRC review of the +8,000 page License Application (LA) and admitted support documentation**
  - DOE has made electronically available on the NRC's web page over 3.5 million documents, estimated to exceed 30 million pages)
  - Review and hearing process will take three to four years.
- **Since November 2008, the NRC review of the LA and supporting documentation has led to +400 Requests for Additional Information (RAI)**
  - **Over 200 RAI's** are in the postclosure area
  - The remaining RAI's are on Programmatic, EIS and PCSA issues
- **RAI responses by the project are being well received by the NRC**
- **A construction authorization can be granted only if the NRC concludes that the repository would meet all regulatory requirements**

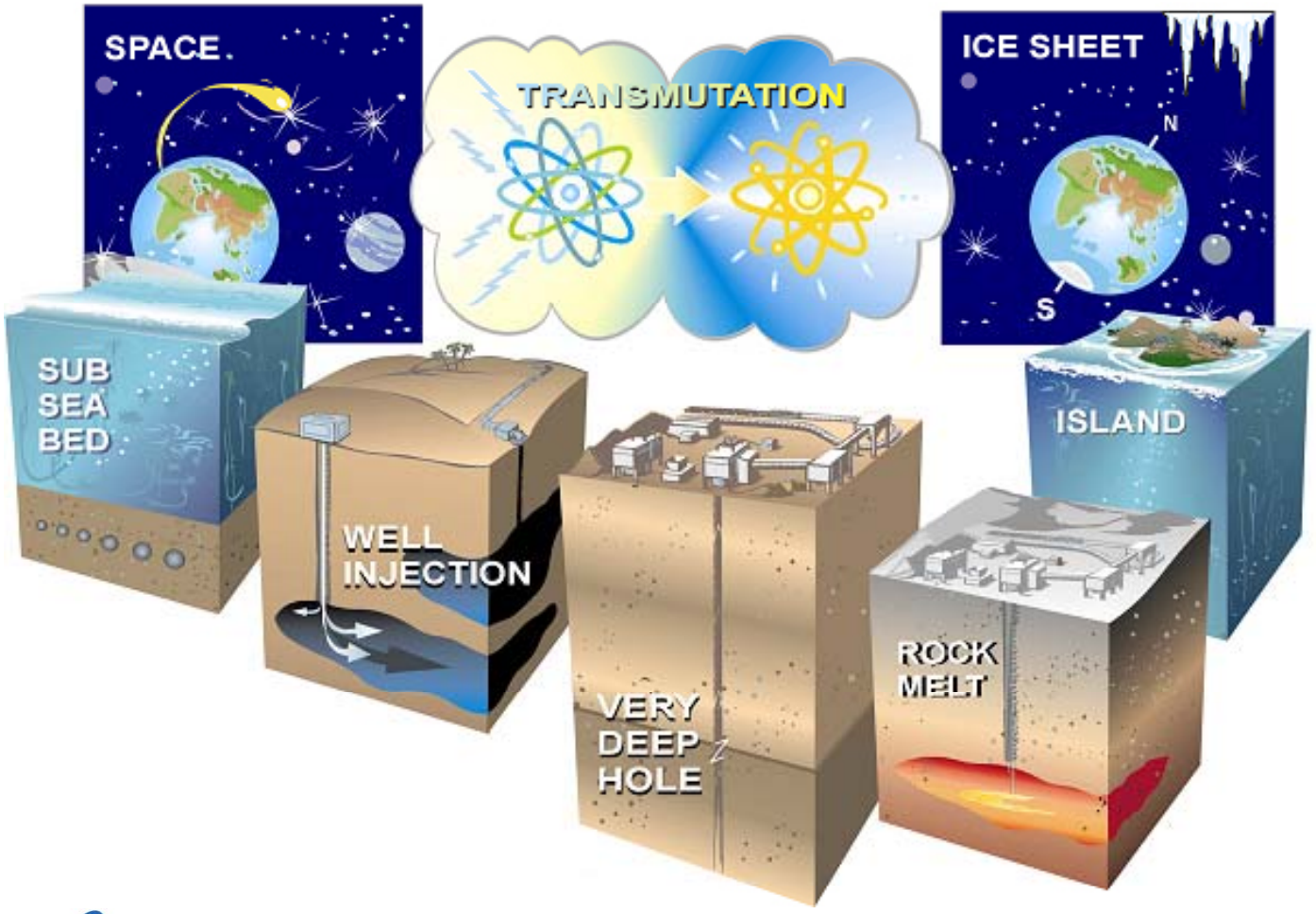
Contentions and the Yucca Mountain License Application Process

- **Affected parties (individuals, organizations and states) can submit concerns on the LA through a formal process**
- **Must have an admitted contention to be part of the licensing adjudicatory process**
- **The Atomic Safety and Licensing Board(s) will conduct hearings that generally will be open to the public and oversee an adjudicatory process to review these contentions**
  - **Contentions submitted:**
    - Surface, Subsurface, and PCSA: **45 contentions**
    - Postclosure: **162 contentions**
    - Programmatic and EIS: **92 contentions**
- **The Atomic Safety and Licensing Board has admitted all but one of the contentions to the hearing process.**
- **Hearings on these contentions should begin in the summer 2009**

Change being driven by Politics

- The Administration (President, Secretary of Energy, and Senate majority leader Harry Reid) have decided to eliminate the Yucca Mountain Program while developing disposal alternatives
  - **Blue Ribbon Panel (Secretary of Energy Lead)**
    1. **The BRP will be formed in the summer of 2009**
    2. **Mission:**
       - **Review NWPA decisions of 1982/1987**
       - **Determination of reprocessing viability (R&D focus)**
       - **Interim central storage or maintain on site storage**
  - **Current Congressional language of the mission for the BRP indicate potentially a 2-3 year process**

The Blue Ribbon Panel: What alternative concepts for waste disposal will be reconsidered?



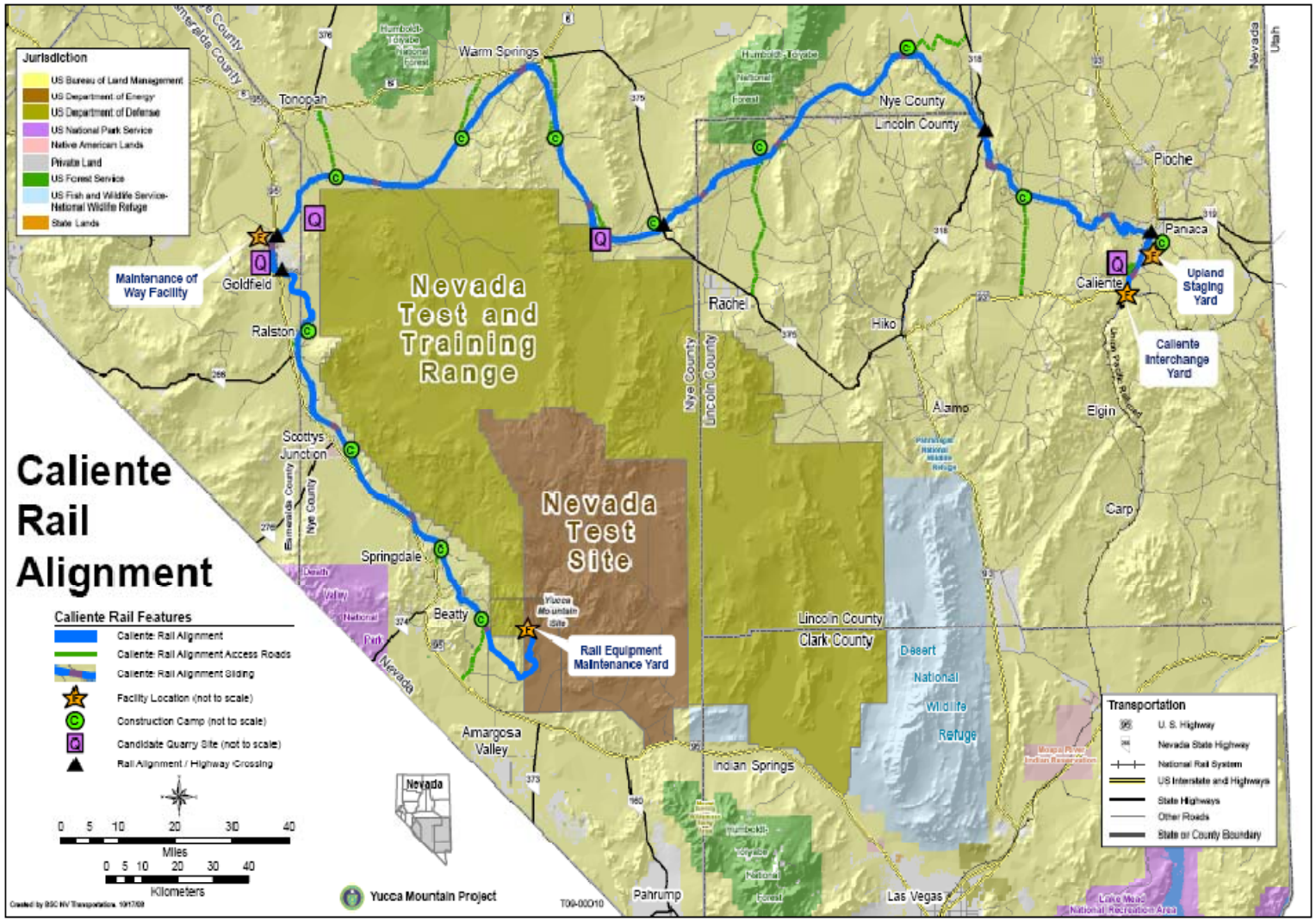
The Panel will also consider:

- **Reprocessing**
- **HLW disposal in salt**
- **Interim storage**
- **Pu recycling**
- **Etc …..**

Funding and Political Status

- **Yucca Mountain funding is now limited to only those costs necessary to participate in the NRC proceedings and an effort by the Administration to devise a new strategy toward waste disposal**
  - **$ 288 million for FY 2009**
  - **$ 197 million for FY 2010**
    - **$30 million goes to support the Blue Ribbon Panel**
    - **Leaves ~$167 million for LA defense**
- **DOE-RW is no longer calling Yucca Mountain a "Project"; they are solely focused on supporting the NRC licensing process and are no longer doing any long term project planning, transportation or engineering work**
- **President has named Pete Miller to head Nuclear Energy and RW will become a sub-department of NE**
- **The transportation EIS is complete and has undergone considerable public comment and is currently under revision**

Nevada rail corridor



DOE proposes to construct a new 333-mile long rail line for shipments from Caliente, Nevada to the proposed repository

Questions?