

**U.S. DEPARTMENT OF ENERGY  
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT**

**NUCLEAR WASTE TECHNICAL REVIEW BOARD  
FULL BOARD MEETING**

**SUBJECT:           REVIEW OF THE REGULATORY  
BACKGROUND OF 10 CFR PART 960**

**PRESENTER:       STEPHAN J. BROCOUM**

**PRESENTER'S TITLE  
AND ORGANIZATION:   ASSISTANT MANAGER FOR SUITABILITY AND LICENSING  
YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT OFFICE**

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**SEPTEMBER 12-13, 1994  
LAS VEGAS, NEVADA**

# **Regulatory Background of 10 CFR Part 960**

- **Sec. 112 (a) of Nuclear Waste Policy Act required DOE to issue guidelines for recommendation of sites for repositories**
  - **“...such guidelines shall specify factors that qualify or disqualify any site from development as a repository, including factors pertaining to ...hydrology....”**
- **DOE issued 10 CFR Part 960 General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories 12/6/84**

# **Proposed Disqualifying Condition**

## **Draft 10 CFR Part 960**

**A site would be disqualified if the “expected pre-waste-emplacment ground-water travel time along any path of likely radionuclide travel from the disturbed zone to the accessible environment is less than 1000 years, unless the characteristics and conditions of the geologic setting, such as the capacity for radionuclide retardation and the ground-water flux, would limit potential radionuclide releases to the accessible environment to the extent that the requirements specified in 960.4-1 could be met.”**

# **NRC Preliminary Concurrence Condition on 10 CFR Part 960**

- **NRC - “DOE should not frame its guidelines such that a 1000-year ground-water travel time would be adjusted, particularly in the early stages of site selection”**

## **DOE Response**

- **Deleted text allowing ground-water travel time of less than 1000 years and revised text to read**

**“A site shall be disqualified if the pre-waste-emplacement ground-water travel time from the disturbed zone to the accessible environment is expected to be less than 1000 years along any pathway of likely and significant radionuclide travel.”**

# **Additional Comments on Wording**

- **DOE maintained that wording “and significant” was important**

**— to avoid disqualifying an adequate site when early predictions indicated that small amounts of water incapable of carrying significant amounts of radionuclides might reach the accessible environment in less than 1000 years**

## **NRC Final Comments**

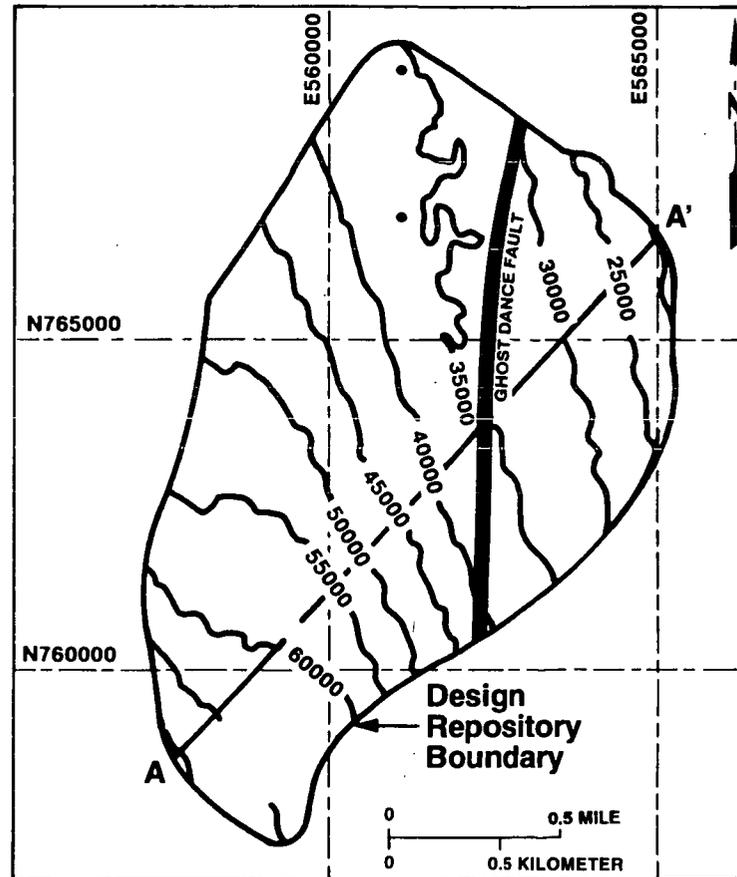
- **Did not object to the difference in phrasing between the DOE guideline and its counterpart in 10 CFR Part 60 — concluded that DOE’s final revision was not in conflict with Part 60**

# Implementation of 10 CFR Part 960

- **DOE required to evaluate Part 960 as basis for nominating sites for characterization**
- **Environmental Assessment for Yucca Mountain issued in 1986**
  - **included lower-level finding that Ground-Water Travel Time Disqualifying Condition was not present**

# DOE's Environmental Assessment: First Evaluation of GWTT

**Mean Total Travel-Time Contour Map  
for Yucca Mountain Site  
(from DOE, 1986)  
(Disturbed Zone\* to Water Table)**



\* Disturbed Zone thickness = 50 m

# Travel Time Estimates for Flux of 0.5 mm/yr (DOE, 1986)

<u>Travel Paths</u>	<u>Travel Times (yrs)</u>
<b>Unsaturated Zone</b>	
Minimum	9,000
Mean	43,000
Maximum	80,000
<b>Saturated Zone</b>	less than 150 years
<b>Disturbed zone = 50 m</b>	

# **DOE Conclusion in Environmental Assessment**

**"Using an upper bound on the estimated unsaturated zone flux and a range of values for saturated hydraulic conductivity and effective porosity at the Yucca Mountain site, estimates of the expected pre-waste-emplacment ground-water travel time along any path of likely and significant radionuclide travel from the disturbed zone to the accessible environment are more than 1,000 years. Therefore, the evidence does not support a finding that the site is disqualified (level 1)."**

# **Current Status of DOE's Approach to Evaluating Ground-Water Travel Time**

- **Focus has been on developing an approach that provides the technical basis for evaluating both NRC's 10 CFR Part 60 Performance Objective for the Geologic Setting and the DOE Disqualifying Condition**
- **Presentation of the general approach to Nuclear Waste Technical Review Board 4/94**
- **Letter transmitted to NRC on 6/10/94, describing DOE approach and requested NRC comments**
- **NRC response on 8/23/94 provided useful comments and suggested topics for discussion at upcoming Technical Exchange**