



U.S. Department of Energy  
Office of Civilian Radioactive Waste Management



# Yucca Mountain Project Update

Presented to:

**Nuclear Waste Technical Review Board**

Presented by:

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**U.S. Department of Energy**

**Yucca Mountain Site Characterization Office**

**September 10-12, 2001**

**Las Vegas, Nevada**

# Topics for Discussion

- **Perspective on Site Recommendation**
- **Path forward and plans for Fiscal Year 2002**
- **Actions completed and planned work in four areas of Board concern**

# Information Supporting the Site Recommendation Process

Between May 4 and August 21, 2001, the Department of Energy released information for public review to facilitate the development of comments.

- ***Yucca Mountain Science and Engineering Report*** - describes the results of site characterization studies completed to date, the waste forms to be disposed, repository and waste package conceptual designs, and updated assessments of the long term performance of the potential repository. (May 4)
- ***Supplement to the Draft Environmental Impact Statement*** - addresses the most recent information on design evolution, including enhancements in design details and operating modes, and the associated potential environmental impacts. (May 4)
- **Total System Life Cycle Cost of a Civilian Radioactive Waste Management Program** - represents the most recent estimate of the cost to dispose of the nation's spent nuclear fuel and high-level waste. (May 4)

# Information Supporting the Site Recommendation Process

(Continued)

- **Nuclear Waste Fund Fee Adequacy: An Assessment** - presents the most recent estimate of the adequacy of the Nuclear Waste Fund fee for the disposal of commercial spent nuclear fuel. (May 4)
- **FY01 Supplemental Science and Performance Analyses**
  - ***Volume 1 - Scientific Bases and Analyses*** - describes new and updated information developed since the completion of the *Yucca Mountain Science and Engineering Report* and the results of an unquantified uncertainty and lower-temperature operating mode analyses. (June 30)
  - ***Volume 2 - Performance Analyses*** - describes the performance assessment analyses using the updated information described in Volume 1. (July 17)
- ***Yucca Mountain Preliminary Site Suitability Evaluation*** - describes the results of a preliminary evaluation of the Yucca Mountain repository system against the Department of Energy's proposed suitability guidelines at 10 CFR Part 963. (August 21)





# Site Recommendation Consideration Hearings Times and Locations

- **September 5, 2001: Department of Energy, Great Basin Room, 232 Energy Way, North Las Vegas, Nevada**
- **Interactive Audio/Video Link-ups to:**
  - **Carson City, Nevada State Legislative Building Room 1214, 401 South Carson Street**
  - **Reno, Desert Research Institute Conference Rooms A/B, 2215 Raggio Parkway**
  - **Elko, Elko Convention Center  
700 Moren Way**
- **Live Non-interactive Webcast at <http://www.ymp.gov>**



# Site Recommendation Consideration Hearings Times and Locations

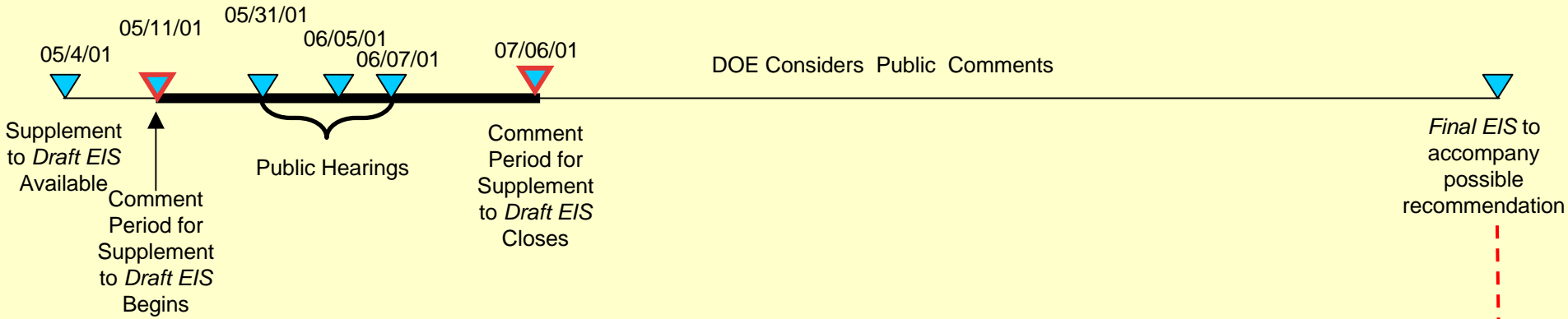
(Continued)

- **September 12, 2001: Longstreet Inn and Casino, Highway 373, Amargosa Valley, Nevada**
- **September 13, 2001: Bob Ruud Community Center, 150 Highway North #160, Pahrump, Nevada**

# YMP Public Involvement Opportunities in 2001

## Environmental Impact Statement (EIS)

Public comment period



## Site Recommendation Process

Public comment period

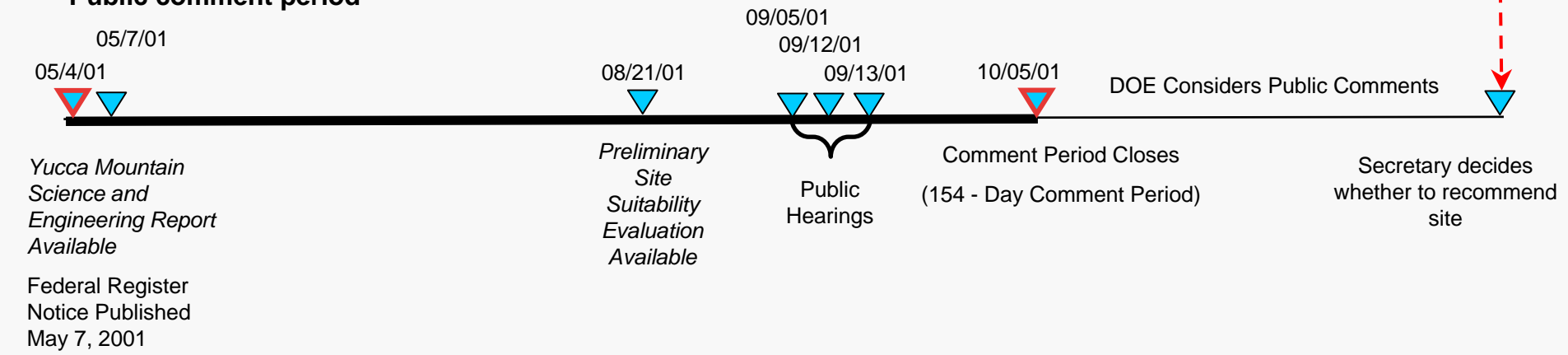


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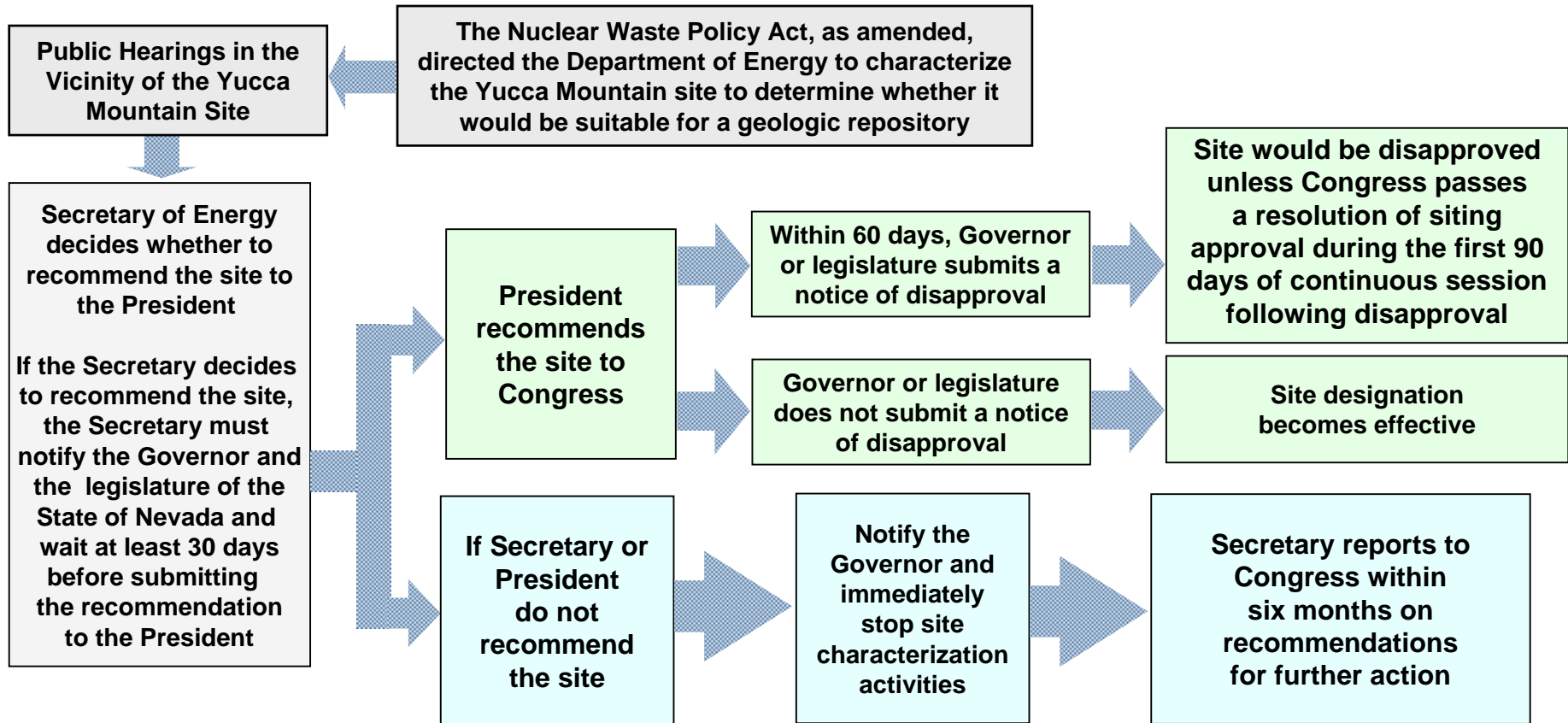
# Public Comment Process

- **Written or oral comments may be submitted during the public hearings**
- **Comments may be mailed to:**
  - **Carol Hanlon, U.S. Department of Energy  
Yucca Mountain Site Characterization Office (M/S #25)  
P.O. Box 30307,  
North Las Vegas, Nevada, 89036-0307**
  - **Please designate “Possible Site Recommendation for Yucca Mountain”**
- **Comments may be submitted via electronic mail to  
YMP\_SR@ymp.gov**
- **Comments may be submitted by facsimile to  
1-800-967-0739**





# Site Recommendation Process Consistent with the Nuclear Waste Policy Act



# Fiscal Year 2002 Planning Focus

- **DOE will focus resources on strengthening infrastructure to respond appropriately to the results of the SR decision process**
  - **If the Secretary decides not to recommend the site, DOE has six months to report back to Congress with recommendations and begin site reclamation**
  - **If Congress does not designate the site, DOE will respond to Congressional direction**
  - **If the site is recommended and designated, DOE will proceed toward licensing through a planned set of pre-licensing activities**

# Planned Pre-Licensing Activities

- **Complete technical work to meet NRC-DOE agreements that address NRC's Key Technical Issues**
- **Develop level of design detail appropriate for inclusion in a license application**
- **Update process models and continue analyses of uncertainties**
- **Conduct Integrated Safety Analysis for preclosure operations**
- **Conduct Total System Performance Assessment for License Application (TSPA-LA)**

# Planned Pre-Licensing Activities

(Continued)

- **Support NRC adoption of Environmental Impact Statement**
- **Develop and certify Licensing Support Network under 10 CFR Part 2, Subpart J**
- **Resolve outstanding quality assurance issues**
- **Develop descriptions of post-licensing programs (e.g., performance confirmation; safeguards and security)**
- **Prepare and submit License Application**

# The Board's Areas of Concern — Summary

- **Since the Viability Assessment, the Board has identified, expressed, and focused their views and concerns on DOE's basis for a possible site recommendation**
- **In January 2001, these views and concerns coalesced into four specific areas of concern**
  - **Meaningful quantification of uncertainties**
  - **Progress in understanding corrosion processes**
  - **Comparison of lower- and higher-temperature designs**
  - **Multiple lines of evidence (MLEs) developed independent of TSPA**

# The Board's Areas of Concern — Summary

(Continued)

- **DOE has worked aggressively to address the Board's concerns**
  - **Developed the Supplemental Science and Performance Analyses**
  - **Convened an independent peer review of corrosion processes**
  - **Reviewed work needed to evaluate range of operating modes**
  - **More clearly recognized importance of and explained MLEs**
  - **Convened International TSPA Peer Review**



# Status of Area of Concern 1

## Meaningful Quantification of Uncertainties

- **The Board has stated that meaningful quantification of uncertainties associated with performance is essential for policy makers**
- **DOE began an effort to quantify unquantified uncertainties in late-2000**
  - **Initial results were presented to the Board at a meeting in May 2001; with more detailed discussions in June 2001**

# Status of Area of Concern 1

## Meaningful Quantification of Uncertainties

(Continued)

- **DOE will continue to revisit uncertainty evaluations, as new information comes to light, to ensure that effects of minor uncertainties do not have a “non-negligible” cumulative effect**
- **DOE has addressed the Board concern and believes that uncertainties are sufficiently quantified to provide policy makers with an adequate basis for their decisions**

# Status of Area of Concern 2

## Progress in Understanding Corrosion Processes

- **The Board's concern is with the understanding of the underlying fundamental processes involved in predicting the rate of waste package corrosion**
- **DOE agrees it is important to develop an understanding of the underlying physical phenomena of corrosion processes**
- **DOE convened a peer review panel on corrosion processes in May 2001**
  - **Interim peer panel report is due in September 2001**
  - **Final peer review report is due in April 2002**

# Status of Area of Concern 2

## Progress in Understanding Corrosion Processes

(Continued)

- **DOE benefited from the Board's international workshop on long-term extrapolation of passive behavior in July 2001**
- **DOE believes that the bounds on waste package corrosion that will be used to support the SR decision are adequate and a confirmatory testing program is now in place**

# Status of Area of Concern 3

## Lower-Temperature Design Comparison

- **The Board concern is that the performance projections are very uncertain, due primarily to the high temperature repository design**
- **DOE's is addressing this concern by evolving the higher-temperature "base case" design into a design that could be operated over a range of thermal objectives**
- **Assessments of repository performance across a range of thermal environments are documented in the SSPA and described in the Yucca Mountain Science & Engineering Report (YMS&ER)**
- **DOE believes that the performance projections are adequate for the range of operating environments considered in the SR basis documents**

# Status of Area of Concern 4

## Multiple Lines of Evidence

- **The Board views DOE's safety case as overly dependent on performance assessment and strongly endorses efforts to develop multiple lines of evidence (MLEs)**
- **MLEs have been integral to the development of process and performance models, but this may not have been effectively communicated**
- **Board members and staff met with DOE to discuss the meaning and applicability of MLEs in April 2001**
- **DOE believes that discussion and evaluation of MLEs has been more clearly explained and is being more successfully incorporated into documents and plans**



# Conclusions

- **DOE has initiated, in accordance with the requirements of the NWPA, and is proceeding with a process for a Secretarial decision on whether or not to recommend approval of the Yucca Mountain site**
- **DOE's path forward depends on the results of the SR decision process, however DOE is prepared to respond appropriately**
- **DOE understands and has benefited from the Board's concerns and issues. These concerns have been addressed and DOE believes there is an adequate technical basis for an SR decision**