

Update: Yucca Mountain Site Characterization Office

**Presentation to:
Nuclear Waste Technical Review Board (NWTRB)**

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Office of Civilian Radioactive
Waste Management**

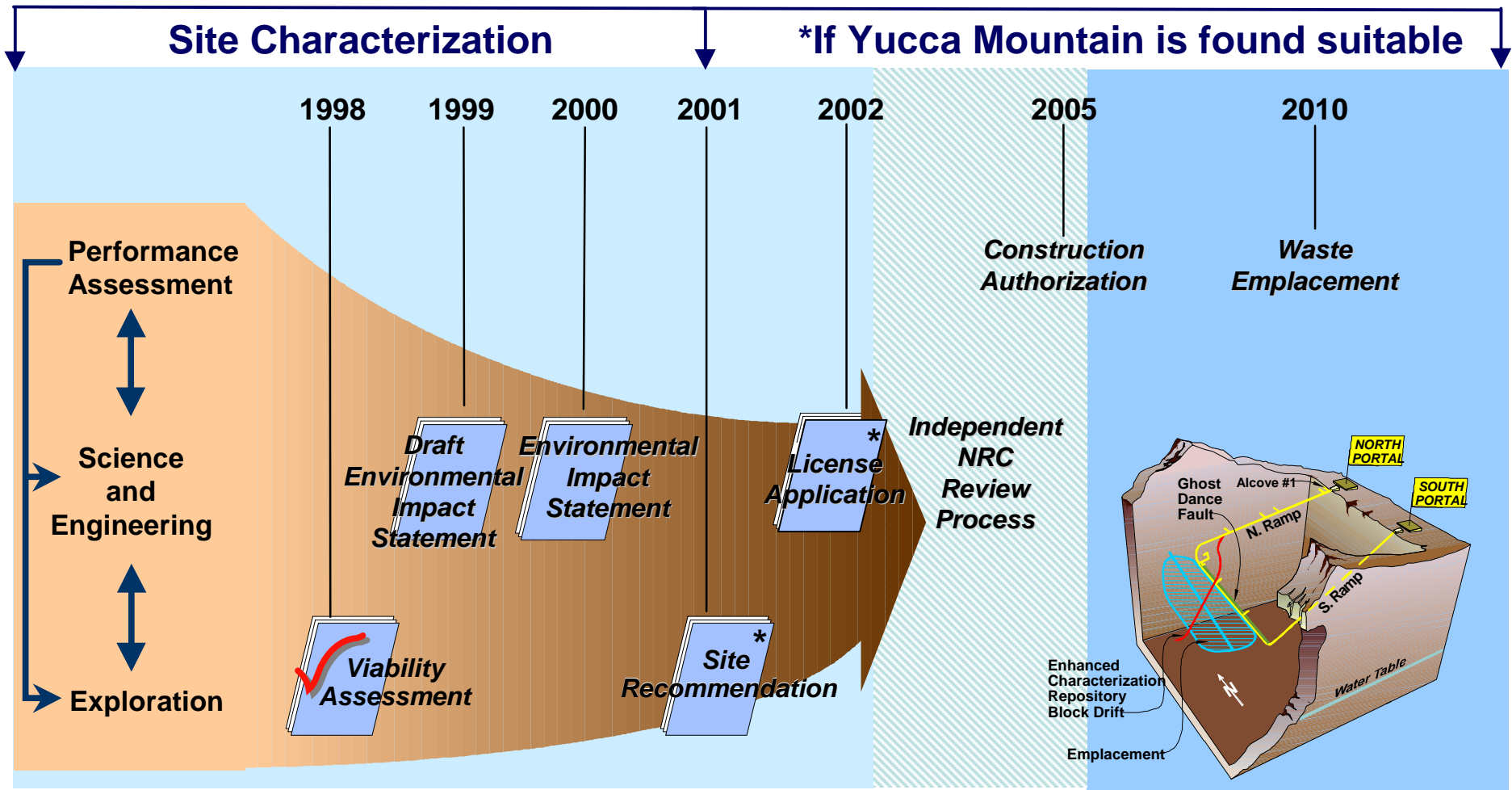
**Yucca
Mountain
Project**

Topics for Discussion



- **Planned work in FY 1999 and FY 2000**
- **Site Recommendation Decision Process**
- **Technical Integration to support SR and LA**

Milestones



Major Products for FY 1999



- ✓ **Issued the VA - December, 1998**
- ✓ **Completed and released the TSPA-VA Technical Basis Report - December 1998**
- ✓ **Completed and released the Site Description Document - January 1999**
- **Complete design alternatives activity and select SR/LA design concept - July 1999**
- **Publish NOA for Draft Environmental Impact Statement - July 1999**

Next Steps - A Look Ahead



- **Project has shifted from focusing on the VA to focusing on the EIS and Site Recommendation process**
- **We are developing a comprehensive plan that**
 - **Leads to a final environmental impact statement in 2000**
 - **Provides sufficient information for a defensible evaluation of suitability in 2001, and if suitable;**
 - **Can support a recommendation to the President that DOE proceed with submitting a license application to the NRC for construction of a geologic repository in 2002**

Design Selection



- **Design alternatives and options have been assessed and DOE will select a single design concept for the Site Recommendation and LA**
- **The goal of the design concept is to:**
 - **Support assessments of preclosure and postclosure system performance**
 - **Be integrated with and complement the natural barriers**
 - **Provide required defense-in-depth through multiple barriers**

Reprioritization of Technical Work for SR and LA



- **In the VA volume 4, table 2-2 identified the principal factors of repository performance and prioritized information needs**
- **A preliminary reprioritization has begun using alternative design concepts and technical information obtained since VA**
- **The alternative design concepts will introduce some additional factors important to performance related to the drip shield and the saturated zone, and changes the relative importance of other factors**

Reprioritization of Technical Work for SR and LA



- **The four key attributes of the Repository Safety Strategy remain the same;**
 - limited water contacting the waste package
 - long waste package life
 - low rate of radionuclide release
 - concentration reduction along flow paths
- **Reprioritization will be completed to support FY 2000 planning after the SR/LA design is selected**

Key Design Activities in FY 2000



- **Develop process models and information feeds used as the basis for TSPA abstractions**
- **Continue materials testing and analysis for waste package and waste form**
- **Development and maintenance of requirements for MGR systems**
- **Develop necessary design products to support the SR**

Key Planned Scientific Investigations in FY 2000



- **ESF and Cross-drift testing**
 - Continue bomb-pulse Cl-36 validation: Systematic analysis of rock samples for Cl-36, H-3, C-14 and Tc
 - Ambient moisture distribution/ventilation effects in the ESF and Cross-drift
 - Hydrologic and rock properties test in the Cross drift
 - Solitario Canyon Fault tests
 - Seepage and fracture–matrix interaction tests in the ESF
 - Drift-scale thermal test in the ESF
- **Volcanic/alluvial aquifer testing complex**
 - tracer and hydrologic tests coordinated with Nye County

Site Characterization



- **Site characterization formally ends with the Secretary's decision whether or not to recommend that the President approve the site**
- **Performance confirmation, which begins during site characterization, will continue until repository closure**
 - **Performance confirmation tests, experiments, and analyses will focus on evaluating the accuracy and adequacy of the information used to determine that the NRC's postclosure performance objectives will be met**
- **Research and development testing may also be conducted to confirm the adequacy of design and to resolve any remaining concerns**

Site Recommendation Decision Process



- **Site Recommendation Consideration Report - in 11/00**
- **Public Comment Period and Consideration Hearings - beginning in 11/00**
- **Site Recommendation Report (draft) - in 04/01**
- **Site Recommendation decision by the Secretary of Energy - in 06/01**

Site Recommendation Decision Process

(continued)

- **Site Recommendation Consideration Report will be completed in 11/00 for SR Consideration Hearings and public comment**
 - **Volume 1: Summary of technical information required by Section 114 of the NWPA**
 - » **Description of the proposed repository design and waste form or packaging**
 - » **Discussion of data obtained in site characterization... relating to the safety of the site**
 - » **Summary of TSPA-SR rev. 0**

Site Recommendation Decision Process

(continued)

- **Volume 2: Preliminary Suitability evaluation based on TSPA-SR rev. 0 includes**
 - » **Technical conclusions compared to the regulations in place at that time**
 - » **Focus on the postclosure performance of a geologic repository at Yucca Mountain**
 - » **A preliminary preclosure safety evaluation of repository facilities using preliminary engineering specifications**

Site Recommendation Decision Process

(continued)

- **Site Recommendation consideration hearings and public comment period**
 - public comment period on the SR Consideration Report is planned for 11/13/00 to 1/12/01
 - public hearings in 12/00 (at least two locations) near the site as required by sec 114 of the NWPA
- **Site Recommendation Report (draft) will be completed in 04/01 after considering public comments**
 - revised technical content in volumes 1 and 2 after considering public comments
 - TSPA-SR rev. 1 will provide basis for suitability evaluation in volume 2
 - Findings relative to the siting guidelines will be included in volume 2

Site Recommendation Decision Process

(continued)

- **Site Recommendation decision by the Secretary of Energy in 06/01 will be based on the information required by the NWPA:**
 - **Final EIS**
 - **Site Recommendation Report (Volumes 1 & 2)**
 - **the views and comments of the Governor and legislature of any state and responses of the Secretary of Energy**
 - **Preliminary comments from the NRC on sufficiency of information for inclusion in a license application**
 - » **site characterization analysis**
 - » **waste form proposal**
 - **Other information the Secretary of Energy considers appropriate**

Adequacy of Information



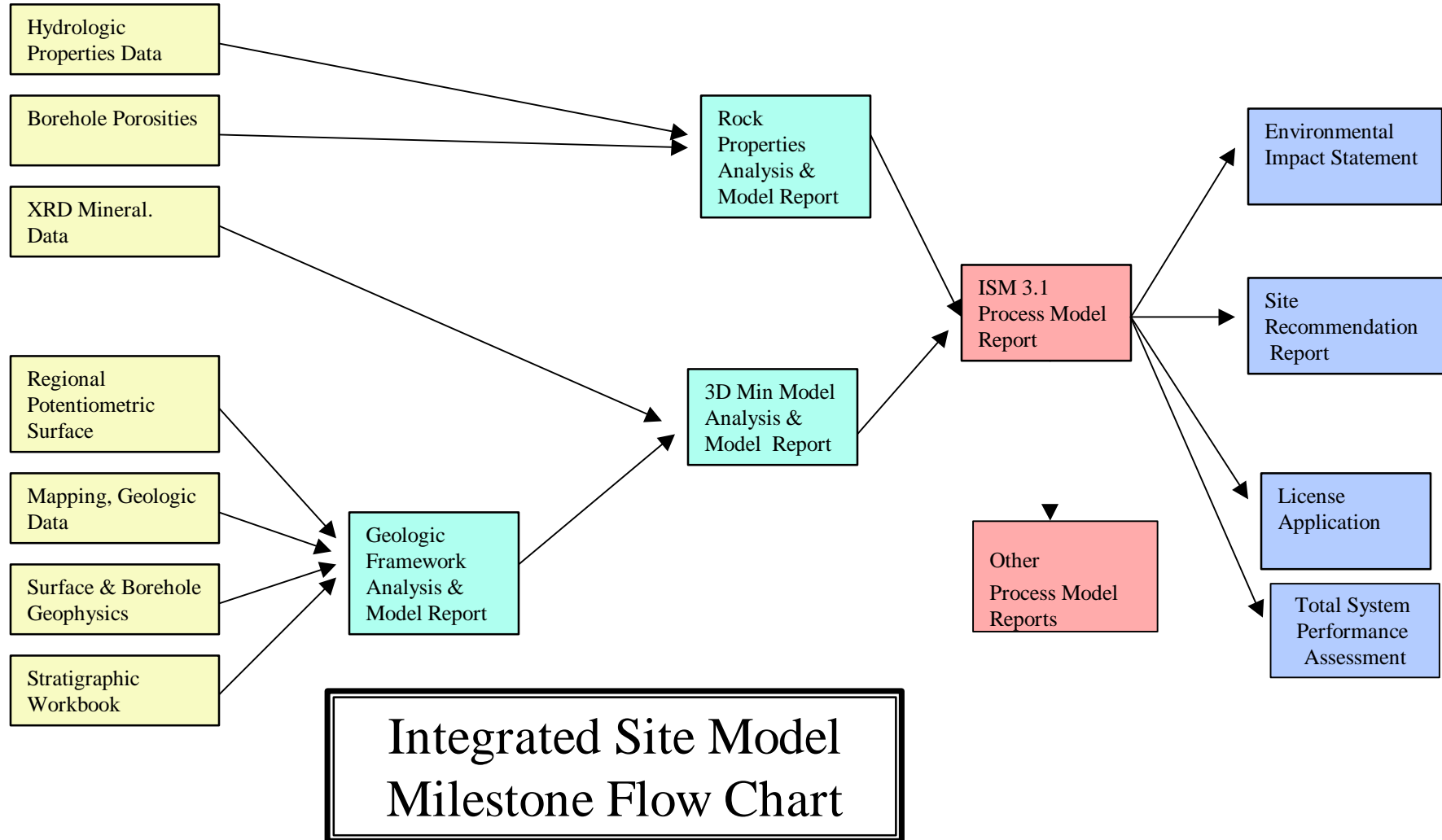
- **Information is adequate for evaluating compliance with regulatory requirements when:**
 - **A defensible compliance position can be demonstrated through:**
 - » **Transparent and traceable TSPA,**
 - » **Corroborative site characterization data and observations, including analogue studies,**
 - » **Defensible demonstration that individual natural and engineered barriers will perform as expected**
 - **The compliance arguments can pass a credibility test from technical experts, regulatory and legal specialists, and policy and decision makers**
 - **It is unlikely that new information will change conclusions about repository performance**

Technical Integration to Support SR and LA



- **SR and LA will require documentation which is**
 - **Defensible through technical rigor, and**
 - **Defensible through documentation of the processes used**
- **After self assessments, DOE is improving traceability of documentation using a top-down approach**
 - **Process Model Reports, supported by**
 - » **Analysis and Model Reports, supported by**
 - **Qualified data, codes and models and other info**
 - **System Description Documents supporting design**
- **Developing technical documentation using a controlled set of data and models will provide a defensible evaluation of compliance**

Process Model Report Logic



Technical Integration to Support SR and LA

(continued)

- **Process Model Reports are the equivalent of the TSPA Technical Basis Report prepared in support of the TSPA-VA**
- **The TSPA is the primary tool for integrating scientific and design information for post-closure performance**
 - **Analysis and Model Report information is combined with LA Design Selection results to support TSPA**
 - **Technical and regulatory conclusions are supported with:**
 - » **Corroborative measurements and observations**
 - » **Natural and anthropogenic analogues**
 - » **Peer reviews and expert elicitations**

Technical Integration to Support SR and LA

(continued)

- **System Description Documents (SDDs) are used to define the requirements for the repository design**
- **SDDs will provide a demonstration of compliance with repository requirements on a system by system basis**
- **SDDs form the basis for the description of the repository in the Site Recommendation Report and are the basis for the preliminary engineering specifications**

Summary



- **Work scheduled in the remainder of FY 99 and planned for FY 2000 is intended to produce a well documented Site Recommendation Consideration Report for public review in November 2000**