



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



Enhancing Confidence, Technology, and Efficiency for Radioactive Waste Management

Presented to:
Nuclear Waste Technical Review Board

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May 8, 2002
Washington, D.C.

Outline

- **Overview of the proposed science and technology program**
- **Relationship of the science and technology program to performance confirmation**
- **Task force scope of work**
- **Examples of areas of investigation**
- **Summary**

Overview

- **DOE has endorsed a detailed work plan (DWP) through license application (LA)**
 - **Work scope adequate to support preparation of a viable LA by late 2004**
 - **Addresses NRC's key technical issues and licensing requirements**
 - **Addresses quantifying uncertainties**
- **We are committed to continued scientific investigations to enhance the understanding of the natural and engineered systems, and long-term performance**

Overview

(Continued)

- **Consistent with the DOE's objective of "Long-term Stewardship," a DOE/BSC task force has been established to develop a proposed science and technology program with the intent of**

- **Increasing confidence in projections of performance and understanding of the repository system**
- **Improving existing technologies used in the waste management system**
- **Promoting efficiencies in the repository system**

Overview

(Continued)

- **Task force will make recommendations to DOE/BSC management on possible science and technology strategies and work scope**
- **Science and technology program activities supplement work planned for LA and will not impact the resources necessary to complete the LA**

Performance Confirmation

- **Performance confirmation (PC) is required by NRC (10 CFR 63, Subpart F)**
 - DOE's current PC plan will be revised
 - PC plan will be a part of the LA
- **DOE's science and technology program will be broader than the PC program**
 - Science and technology will address issues and alternatives beyond the basis for the safety case
- **Data collection supporting PC began prior to the completion of site characterization**

Science and Technology Program

Scope of Work

- **Identify potential work scope that will**
 - **Contribute to the OCRWM's long-term objectives and goals (long-term stewardship)**
 - **Increase our understanding of the natural and engineered systems and projections of long-term performance**
- **Evaluate work scope to address technical issues raised internally and by oversight groups**
 - **Track technical issues through resolution**
 - **Handoff to other Project organizations for implementation**

Science and Technology Program Scope of Work

(Continued)

- **Coordinate with other DOE offices, universities, international programs, and other scientific organizations to improve communication and cooperation that enhances information exchange**
- **Identify and plan tests, develop models, and perform analyses that will contribute to our understanding of long-term performance**

Science and Technology Program Scope of Work

(Continued)

- **Identify appropriate milestones for reporting progress and results**
- **Foster excellence within the Project by encouraging publication in peer-reviewed, technical journals**
- **Investigate new, “out of the box” concepts and emerging technologies to improve the waste management system**

Examples

- **Technical areas that will be considered in the science and technology program**
 - **Level III activities (additional technical basis) from the risk prioritization activity conducted to prepare the DWP through LA**
 - **Technical issues common to all repository programs**
 - ◆ **Radionuclide transport (anion transport and use of advanced material technologies to improve retardation)**
 - ◆ **Fracture/matrix flow**
 - ◆ **Use of probabilistic approach**
 - ◆ **Analogue studies to support multiple lines of evidence**
 - **Toxicity/volume reduction of waste**

Summary

- **We are developing a science and technology program to meet the OCRWM Program objective of long-term stewardship**
- **Task force is currently developing proposal that will include**
 - **Identification and planning of**
 - ◆ **Supplemental long-term testing and analyses**
 - ◆ **Development of technologies to improve long term performance and reduce repository costs**
 - **Coordination with university and international programs to interface with the Yucca Mountain science and engineering program**
- **We encourage the Board's input in developing this program**

