



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



Status of OCRWM's Proposed Science and Technology Program

Presented to:
Nuclear Waste Technical Review Board

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September 10, 2002
Las Vegas, Nevada



Outline

- **Objectives**
- **Science and Technology task force activities**
- **Potential Science and Technology Program activities**
- **Summary**



Objectives

- **Increase confidence and address uncertainties in repository performance**
- **Improve existing and develop new technologies to achieve efficiencies in the waste management system (transportation, storage, and disposal)**
- **Achieve savings in the waste management system schedule and life-cycle costs**
- **Promote technical excellence and maintain leadership in nuclear waste management**



Science and Technology Task Force Activities

- **Prepared management plan that defines**
 - **Mission and key objectives**
 - **Functional responsibilities and organizational construct**
- **Established Science and Technology as a line item in Fiscal Year (FY) 04 budget**
- **Developed draft management process for tracking and evaluating Science and Technology proposals and technical activities**
- **Identified large number of proposed activities to screen for possible initiation in FY 03**



Science and Technology Task Force Activities

(Continued)

- **Planning to implement limited number of investigations with emphasis on**
 - **Enhancing contribution of the natural system to system performance**
 - **Identifying advanced technologies that will lead to cost reductions in life cycle costs**
 - **Developing of multiple lines of evidence for barrier performance that include analogue studies**
- **Encouraging participation by external groups (universities and other research institutions)**
- **Planning collaboration with international programs**



Science and Technology Management Process

- **Establishes an approach that**
 - **Encourages new ideas to enhance confidence in performance of site and improve program efficiencies**
 - **Evaluates and prioritizes technical proposals considering established evaluation criteria and use of a formal decision aiding methodology**
 - **Assesses proposed and ongoing Science and Technology work for its applicability to issues addressed in the licensing review process and other Office of Civilian Radioactive Waste Management (OCRWM) Programs**
 - **Allows for online tracking of the status of proposals through approval and implementation**
 - **Allows for transitioning ongoing work to other OCRWM Programs**



Potential Science and Technology Program Activities

- **Science and Technology task force initially identified a large number of proposed activities from within the DOE system that were screened to 27 based on their relevance to the Science and Technology objectives**
- **Recognizing that limited funding will be available in FY 03, the task force screened the 27 to 8 proposed activities for possible initiation in FY 03**
- **OCRWM management elected to focus on five high priority proposed activities for initiation in FY 03**



Potential Science and Technology Program Activities

(Continued)

- **Drift shadow under the emplacement drifts in the unsaturated zone**
 - Evaluate capillary action and gravity flow
 - May enhance contribution of natural system to system performance
 - May lead to cost reduction of engineered system
- **Flow and transport studies at Peña Blanca**
 - Study of the geochemistry and transport of radionuclides from a uranium ore body (Absence of radionuclides in nearby wells)
 - Supports multiple lines of evidence for confidence building and international collaboration



Potential Science and Technology Program Activities

(Continued)

- **Saturated zone studies**
 - Evaluate transport, retardation, and hydrochemistry of groundwater
 - May enhance contribution of natural system to system performance
 - May involve international cooperation
- **Alternative engineered materials**
 - Evaluate advanced material and processing technologies to improve performance and reduce cost of engineered materials
 - Collaborate with the Defense Advanced Research Projects Agency (DARPA)



Potential Science and Technology Program Activities

(Continued)

- **Coupled processes investigations**
 - **Screen and identify key process interactions and design tests to evaluate these key interactions**
 - **Explore the application of Yellowstone geothermal and other analogues that provide insight into coupled processes**
 - **Incorporate results into process models and identify components that should be incorporated into future Total System Performance Assessments**
 - **May enhance system performance and confidence on projections of system performance**



Summary

- **Science and Technology Task force has completed a number of activities to**
 - **Establish a Program and technical work scope to be initiated in FY 03 that addresses the following**
 - ◆ **Increase confidence in the natural system for the licensing review process**
 - ◆ **Consider the application of new technologies to possibly enhance performance and reduce costs**
 - **Address issues and alternatives beyond the licensing basis, but results may provide input into the licensing review process**



Summary

(Continued)

- **Science and Technology will continually evaluate proposals and results of ongoing work for their applicability to other OCRWM Program elements**
 - At any given time either proposals or ongoing work may be transferred to other Programs
- **The Board's suggestions on the Science and Technology's approach and proposed activities are encouraged**

