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The OCRWM Enterprise

A PUBLICATION OF THE OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT (OCRWM)

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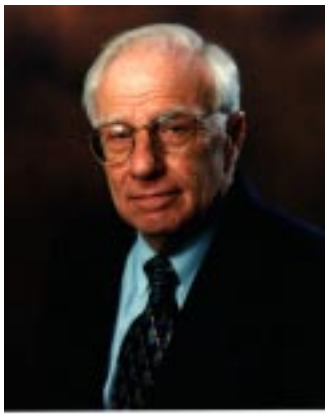
Statement by the OCRWM Director



Dr. Ivan Itkin

I am very pleased to have been nominated and confirmed as the Director of the Department of Energy's (DOE) Office of Civilian Radioactive Waste Management (OCRWM). The OCRWM mission is monumental – to permanently dispose of the Nation's spent nuclear fuel and high-level radioactive waste in a cost-effective manner that protects the health and safety of workers and the public and the quality of the environment. It's an enormous responsibility, and I am proud to have a role in this important effort.

The Program's current focus is on the completion of the scientific site characterization work at Yucca Mountain, Nevada, to provide the information required for a Secretarial decision on whether to recommend the Yucca Mountain site to the President for development of a permanent geologic repository. Data on the proposed repository site, design and performance will be incorporated in a site recommendation consideration report that will be issued in late 2000.

While the scientific site characterization work at Yucca Mountain continues, the Department, the Environmental Protection Agency (EPA) and the Nuclear Regulatory Commission (NRC) are simultaneously moving ahead with the development of the regulatory framework required for a workable repository program. EPA is proceeding toward the final rule making on radiation protection standards for Yucca Mountain, and NRC is moving forward with the rulemaking process for repository licensing criteria. To align our siting process with the rulemakings being proposed by our regulators, OCRWM is proceeding with modifications of its siting guidelines for Yucca Mountain.

In other developments, Congress advanced proposals this year which would have refocused the Department's efforts related to management of spent nuclear fuel and high-level radioactive waste. The Senate bill, S.1287, passed by both the House of Representatives and the Senate, was vetoed by the President, in part because it would limit the ability of EPA to exercise its existing authority to fully protect public health and the environment. The Senate has voted to sustain that veto. However, the Administration remains committed to working with Congress to address important issues associated with radioactive waste management.

I am happy to be part of this effort, and I look forward to working with other members of the Administration, the Congress, affected States, local governments and others to meet the challenges ahead.■

OCRWM Issues Program Plan, Revision 3

On March 13, 2000, Revision 3 of the OCRWM Program Plan was released by Dr. Ivan Itkin, OCRWM's Director.

The Plan provides a summary of the Program's statutory mission, vision, and strategic objectives and describes OCRWM's planned major activities, strategies and schedules to carry out its mission. These strategies are consistent with the new draft Department of Energy (DOE) Strategic Plan. The Plan also details the Program's projected funding requirements and explains how the organizational, functional, and administrative structures will support the current objectives. It is predicated on the ultimate emplacement of waste in the proposed repository at Yucca Mountain, Nevada, if the site is found suitable.

Upon his taking office in December 1999 as Director of OCRWM, Dr. Itkin initiated a thorough review and critique of the Program's critical paths, strategies, and planning assumptions - a process that resulted in the approval and release of the OCRWM Program Plan, Revision 3. "My purpose in updating the Plan was to ensure that the OCRWM team and our constituents have the benefit of a clear and current roadmap that shows how we plan to fulfill our statutory mission, and how we expect to establish, and sustain, the requisite scientific credibility," Dr. Itkin said.

The revised Program Plan takes cognizance of several programmatic changes made since publication, in December 1998, of the Yucca Mountain Viability Assessment, including revision of the Program's regulatory framework

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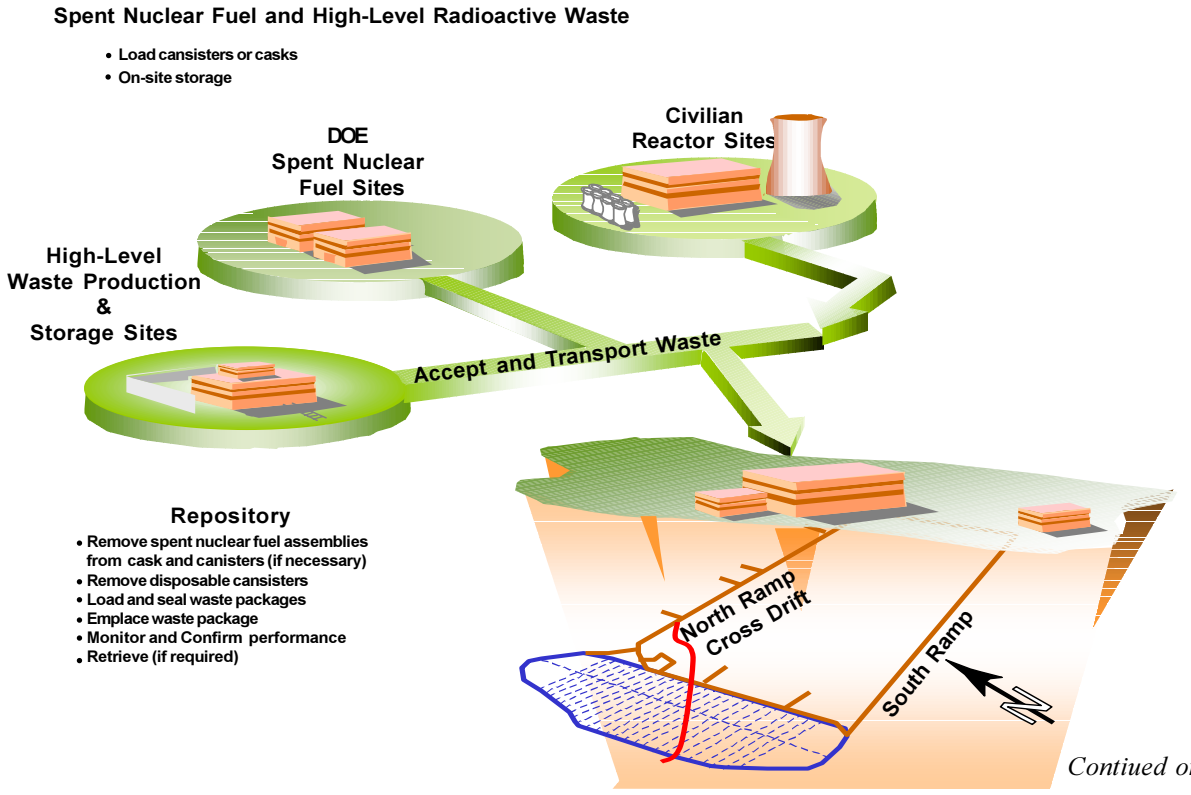
Concept for Civilian Radioactive Waste Management System



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OCRWM Issues Program Plan, Revision 3 - *continued*

resulting from the release, last year, of proposed site-specific Environmental Protection Agency radiation standards for Yucca Mountain, proposed site-specific Nuclear Regulatory Commission licensing regulations, and proposed DOE site suitability guidelines. In releasing Revision 3, Dr. Itkin observed that, "We want to continue OCRWM's practice of periodically reciting and explaining our near-term objectives in a way that shows how our emphasis changes in response to new data and external developments." OCRWM issued its first Program Plan in 1994 and has published updated revisions in 1996 and 1998.

Dr. Itkin added that because the Program's FY 2000 appropriation fell $56.5 million short of the Administration's budget request, the Plan reflects a re-evaluation of our planned activities that identified impacts and refined schedules, taking into account advances in the reference repository and waste package designs. The Plan also reflects the priority given to those science and engineering activities that are most important for reducing uncertainty in the performance of the repository. "Our key objective remains," he said, "to develop the information and data necessary to determine whether there is support for a Secretarial decision on recommendation of the Yucca Mountain site in 2001 and, if the site is recommended, a license application in 2002."

The OCRWM Program Plan, Revision 3, can be obtained by calling 1-800-225-6972. An electronic version of the Plan is available on the OCRWM Home Page at ***http://www.rw.doe.gov.***■

OCRWM Proposes Amendments to the General Guidelines for Siting Nuclear Waste Repositories

On November 30, 1999, DOE issued a supplemental notice of proposed rulemaking designed to formally amend the guidelines. The proposed amendments to the guidelines are specific to Yucca Mountain, and would establish criteria and a methodology for assessing site suitability consistent with the latest scientific and analytical techniques and align the guidelines with the Nuclear Regulatory Commission's (NRC) requirements proposed in February 1999, as well as the Environmental Protection Agency's (EPA) standards proposed in August 1999. DOE proposed that it would evaluate the long-term performance capability of a repository at Yucca Mountain in meeting NRC's and EPA's standards by using a total-system-performance (computer modeling) approach. This approach addresses how specific repository design concepts will work within the natural system at Yucca Mountain to meet public health and safety standards over thousands of years. The Department's supplemental proposal called for the Yucca Mountain site to be deemed suitable only if DOE could demonstrate it was likely to meet applicable radiation protection standards.

Why change the guidelines?

The Department's original guidelines were written during the early 1980s. The Department developed the guidelines to provide the criteria for the evaluation and comparison of several possible repository sites in various geologic media. Both the Nuclear Waste Policy Act of 1982, as amended, and the original siting guidelines anticipated a need for periodic updating to reflect changes in the repository program. The Department is proposing these amendments to reflect prevailing scientific and regulatory views on how best to assess repository performance at the Yucca Mountain site.

Congressional direction affects agencies

The Department is not alone in having to reassess its regulations because of the congressional direction. In 1992, Congress directed EPA to promulgate a new, dose-based standard for a potential repository at Yucca Mountain, a standard designed specifically to further protect public health and safety. Congress also directed NRC to revise its licensing regulations to be consistent with the new EPA standard. Both organizations have since issued their proposed rules for the Yucca Mountain site, and NRC has agreed to modify its rules, as necessary, to EPA's standards once the standards are finalized.

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OCRWM Proposes Amendments to the General Guidelines for Siting Nuclear Waste Repositories - *continued*

How does the Department propose to update these regulations?

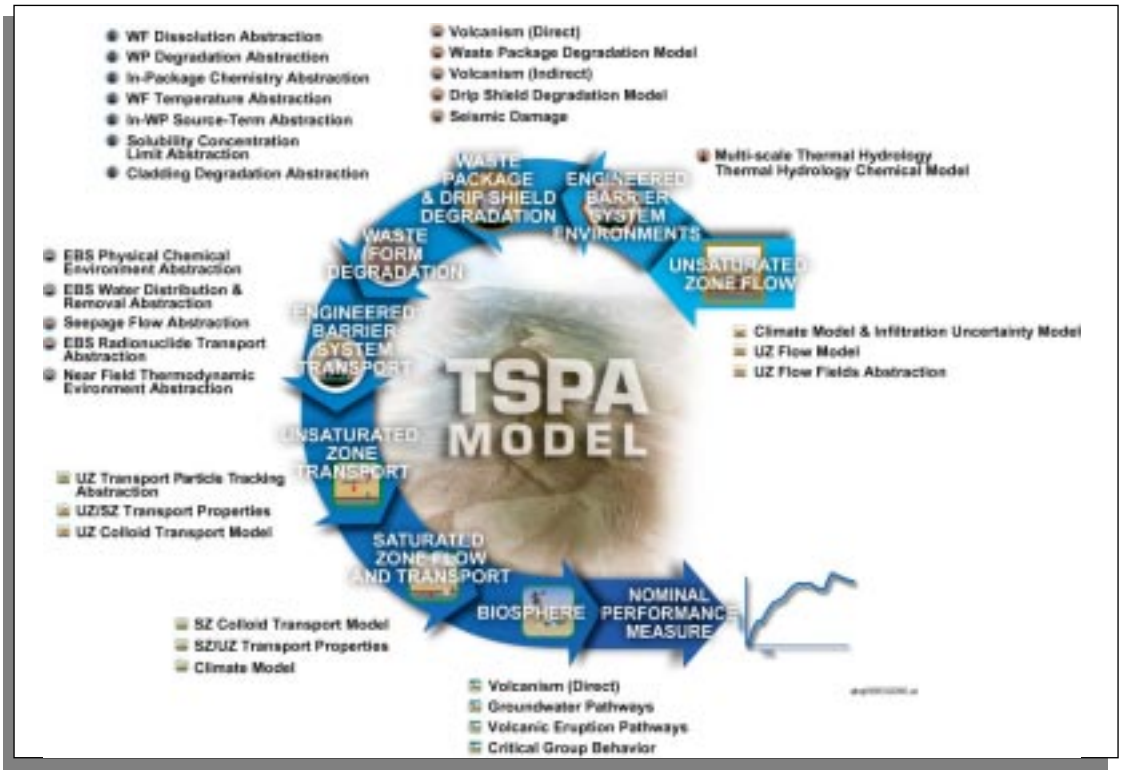
The Department proposes to create a new rule, 10 CFR Part 963, which would govern the evaluation of the Yucca Mountain site alone. After more than a decade of research, scientists now have a better understanding of the Yucca Mountain site and of geologic disposal. The Department has concluded that its assessment of the site's suitability for the postclosure period should rely on a total system performance approach. This would involve looking at how specific design concepts of a repository system will work within the natural system at Yucca Mountain to meet public health and safety standards.

The Department is not proposing to substantively change the existing guidelines (10 CFR Part 960) for screening potentially acceptable sites, for nominating sites as suitable for characterization, or for recommending sites for characterization. The existing guidelines would be changed only to accommodate the new language specific to Yucca Mountain. They would still be used if Congress directs the Department to select other sites for study.

What would the new proposal do?

Consistent with the view of the National Academy of Sciences, as well as with NRC's proposed licensing rules and EPA's proposed standards, the Department recognized the importance of understanding how the different components of the proposed repository system would function together. With this emphasis on a total system performance assessment, the Department would consider technical criteria in an integrated manner. Distinct, independent findings on individual technical factors would not be required, but could be examined to evaluate their individual contributions to overall performance.

The proposed rule would use system performance guidelines similar to those contained in the existing guidelines as the basis for evaluating the suitability of Yucca Mountain for development as a repository. The guidelines would include evaluation criteria for a proposed repository while it is operating and once it has been closed. These requirements also would address EPA's Yucca Mountain site-specific health and safety standards and NRC's licensing regulations that implement the EPA radiation protection standards. Requirements that assess and compare other types of sites would not be included.



Total System Performance Assessment Model

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OCRWM Proposes Amendments to the General Guidelines for Siting Nuclear Waste Repositories - *continued*

How will the process work?

The Department published the proposed regulation in the *Federal Register* on November 30, 1999, which began the public comment period. All comments received by the Department will be considered in the development of the final rule.

The Department issued a subsequent *Federal Register* notice to announce the dates, times, and locations of two public hearings where people could provide oral comments. The public was also encouraged to submit written comments to the Department by February 28, 2000.

Transcripts of these hearings, as well as written comments and documents submitted by the public may be obtained and photocopied at the Yucca Mountain Science Center, at 410B Meadows Lane, Las Vegas, Nevada, or by accessing the OCRWM Home Page at ***http://www.rw.doe.gov.*** In addition, they may be ordered by calling (800) 967-3477.

On May 4, 2000, the Department submitted to NRC for its review and concurrence a draft notice of final rulemaking. The draft notice includes responses to the major relevant issues arising from the comments and concerns raised by members of the public. NRC conducted a similar review and concurrence of the original repository siting guidelines in 1984. The draft notice is available at the above web address. ■

FY 2001 Appropriation Request

Excerpts of Testimony by Dr. Ivan Itkin

The Department has requested $437.5 million in its Fiscal Year (FY) 2001 budget request to support our Nation's policy for the long-term management of spent nuclear fuel and high-level radioactive waste. This request is devoted principally to completion of the scientific and engineering activities that will be the foundation for a presidential recommendation on whether to proceed with a permanent geologic repository at Yucca Mountain, Nevada.

This request includes a funding level of $325.5 million from the Nuclear Waste Fund appropriation, and $112 million from the Defense Nuclear Waste Disposal appropriation.

The FY 2001 budget request is 25 percent greater than our FY 2000 funding level of $351.2 million. This increase reflects the Program's effort to address the remaining work that is necessary for a site recommendation, described in substantial detail in the December 1998 Viability Assessment (VA). The FY 2001 request is also necessary to address work that was deferred due to reduced funding levels in prior years. Regaining momentum with the FY 2001 request will enable the Program to meet its obligation to be responsive to emerging scientific issues, such as those raised during our extensive ongoing interactions with the Nuclear Waste Technical Review Board (NWTRB) and the Nuclear Regulatory Commission (NRC). The FY 2001 budget request also provides the foundation, again as described by the VA, to continue the activities necessary to submit a license application in the following fiscal year, if the President recommends the site for development as a repository. Our approach to addressing these issues with the Board and the Commission as we proceed toward submitting a license application is provided in our recently issued Program Plan (Revision 3).

From the FY 2001 budget request of $437.5 million, we have proposed allocating $358.3 million, an increase of 27 percent above the FY 2000 allocation, to the Yucca Mountain Site Characterization Project. For activities under the purview of the Waste Acceptance, Storage, and Transportation Project, $3.8 million is allocated. For essential program management and integration functions, including those that are required to support a quality assurance program in accordance with NRC regulations and to finalize the environmental impact statement that must accompany a site recommendation, $75.4 million is allocated.

Consistent with the Department's policy regarding management and operating (M&O) contracts, and in conformance with direction provided in the enacted Energy and Water Development appropriations, in FY 2001 we are recompeting our M&O contract. The Program's current management and operating contract was awarded in 1991 and will expire in February 2001. We expect to award a follow-on performance-based contract in FY 2001. With full support of our FY 2001 request, we expect to successfully recompete and achieve our milestone for the decision on site recommendation.

Our request reflects the funding that will be needed to enable us to meet a most critical performance measure: maintaining the schedule to begin waste acceptance by 2010. This has been the Department's goal since 1989. The Department takes seriously its obligation to accept commercial spent nuclear fuel, as well as the need to provide a perma-

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FY 2001 Appropriation Request - *Continued*

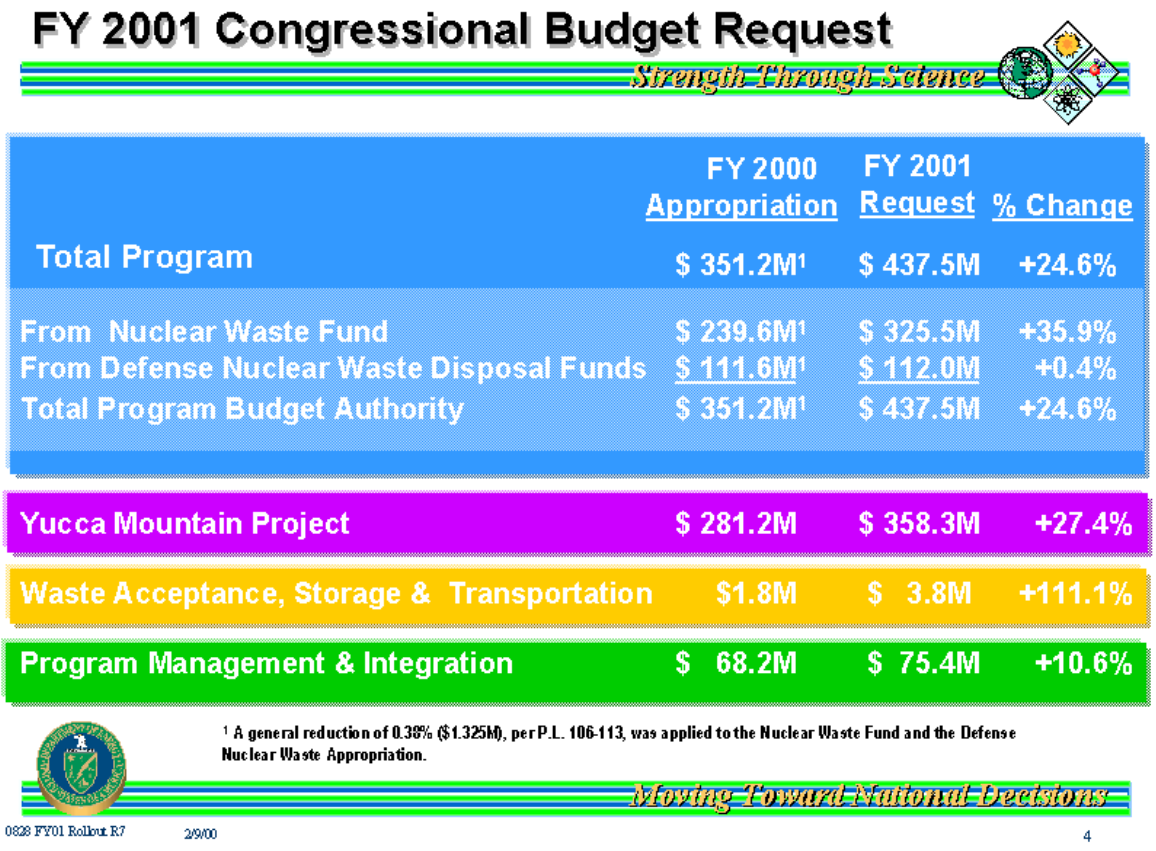
nent disposal solution for defense spent nuclear fuel and other government-owned high-level radioactive wastes.

FY 2001 Activities

In FY 2001, the funds allocated to the Yucca Mountain Site Characterization Project will be used to advance the work identified in the VA. This work includes addressing the remaining uncertainties by studying the presence and movement of water through the repository block, the effects of water movement on the waste package, and the effects of heat from the decay of radioactive materials inside the waste packages on the site's geologic and hydrologic behavior. In addition, the Program is addressing some of the design and engineering work suggested by the NWTRB. Through our work activities, we will:

- Complete the necessary scientific and engineering work for the characterization of the Yucca Mountain site.
- Update the total system performance assessment of Yucca Mountain, integrate process models refined to reflect our current understanding of the geology, hydrology, and geochemistry within Yucca Mountain, and support the development of a site recommendation.
- Issue the Site Recommendation Consideration Report to inform all parties about our findings to date, and hold public consideration hearings, before the Secretary decides whether or not to recommend the site to the President.
- Issue the *Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada.*
- Continue and increase our efforts to support the preparation of a high-quality, complete, and defensible license application to NRC if the President recommends the site in 2001.

The Department is coming to the end of a long road. When we set out to characterize the Yucca Mountain site through an ambitious scientific program, we knew that we would be faced with challenges. We believe that by the end of FY 2001, we will have met those challenges. If the funding level we have requested is supported, we should be able to complete, on schedule, the activities that are necessary for an informed policy decision regarding the Yucca Mountain site. ■



OCRWM FY 1999 Annual Report to Congress

Dr. Ivan Itkin, Director, Office of Civilian Radioactive Waste Management (OCRWM), has submitted the Fiscal Year (FY) 1999 OCRWM Annual Report to Congress. OCRWM is required, in accordance with the Nuclear Waste Policy Act of 1982, as amended, to annually prepare and submit to Congress a comprehensive report on the activities and expenditures of the Office. This is OCRWM's sixteenth report.

The mission of OCRWM is to permanently dispose of the Nation's spent nuclear fuel from civilian nuclear power reactors, high-level radioactive waste from atomic energy defense activities, surplus weapons-grade plutonium, and the Department of Energy's (DOE) spent nuclear fuel, including Navy spent nuclear fuel, in a cost-effective manner that protects the health and safety of workers and the public and the quality of the environment.

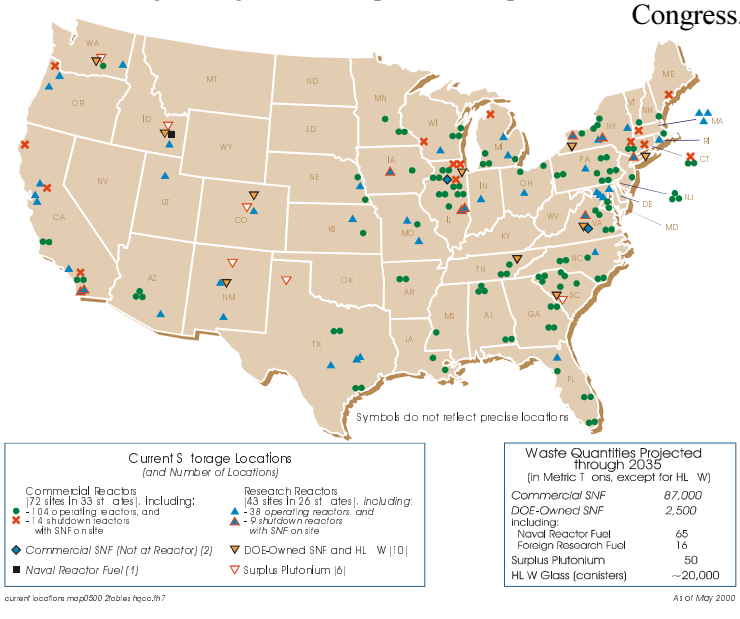
The Civilian Radioactive Waste Management Program achieved significant progress toward key long-term goals during FY 1999, and fulfilled all of the relevant commitments made in the Secretary of Energy's Performance Agreement with the President.

A key milestone was reached with the publication of the draft Environmental Impact Statement (EIS) for the potential repository at Yucca Mountain, Nevada. It is intended as a tool to assist with decision-making and provides public disclosure of information. The draft EIS presents the results of analyses of potential impacts associated with constructing, operating, monitoring, and eventually closing a repository at Yucca Mountain, and of transporting waste to Yucca Mountain from 77 sites across the U.S.

The Program also completed enhanced repository and waste package designs for use in the total system performance assessment to support a site recommendation and potential repository license application. Based on a study begun in July 1998 to reduce uncertainties about repository system performance, the enhanced design will be the basis for the total system performance assessment prepared in support of a determination whether to recommend the site. The enhanced design reduces thermal loading, which will make water movement near the waste packages easier to predict and model. The new design also uses a more corrosion-resistant waste package design and a drip shield to protect waste packages from water and possible rock falls.

The Program published a proposed revision to its repository siting guidelines (10 CFR 963) that focuses on how the total system of natural and engineered barriers would perform. The proposed revised guidelines reflect a shift away from a generic approach that could apply to any site and that focused on individual technical criteria to a site-specific approach that relies on an overall systems evaluation of the expected performance of a repository at Yucca Mountain. These guidelines incorporate the same site-specific approach adopted by the Nuclear Regulatory Commission and the Environmental Protection Agency in proposing Yucca Mountain repository licensing regulations (10 CFR 63) and Yucca Mountain radiological protection standards (40 CFR 197), respectively, earlier in FY 1999.

These activities, with corresponding progress in other important areas, have kept the Program on track to complete the site characterization phase of our work, leading to a decision in 2001 on whether to recommend the Yucca Mountain site to the President and then to the Congress. ■



Current Locations of Nuclear Materials Destined for Geologic Disposal

NWTRB Conducts January and May 2000 Meetings and Issues Report

The Nuclear Waste Technical Review Board (the Board) met in Las Vegas, Nevada, January 25-26, 2000, and in Pahrump, Nevada, on May 1, 2000. The Board's meetings provide the public with an opportunity to observe the Board members, the Office of Civilian Radioactive Waste Management (OCRWM) staff and contractors, and other scientists exchange information on technical issues. At both meetings, OCRWM Director, Dr. Ivan Itkin, updated the Board on the status of the Civilian Radioactive Waste Management Program.

At the January meeting, the Board held sessions on addressing uncertainty in assessing repository performance, the repository safety strategy, and progress in scientific investigations. At the session on addressing uncertainty, the Board heard presentations from OCRWM, the Nuclear Regulatory Commission, and other experts, and held a panel discussion. At the repository safety strategy session, OCRWM provided an update on development of a safety case for a repository, with details on groundwater seepage into repository drifts and design of the drip shield to be placed over the waste packages. In the scientific programs session, OCRWM discussed ongoing studies in the unsaturated zone and the applicability of natural analogs to Yucca Mountain. Presentations were also made on independent investigations of fluid inclusions, which relate to hypotheses of thermal upwelling of groundwater.

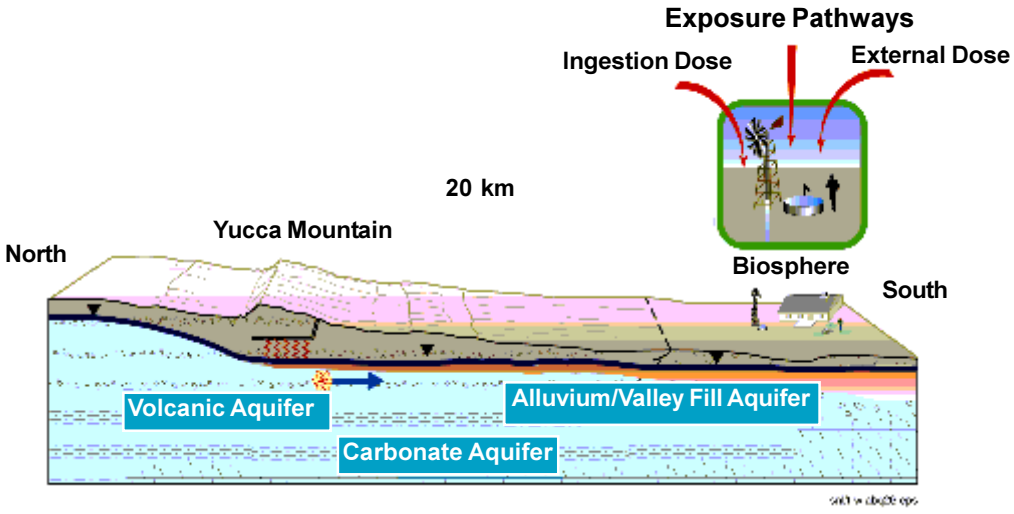
At the May meeting session on repository design, OCRWM made presentations on the current design, the operational flexibility of the design, and the effect of repository temperatures on uncertainties in repository performance. At the session on scientific programs, OCRWM discussed the status of performance assessment activities and how dose calculations beyond 10,000 years will be presented. OCRWM also presented an update on the scientific investigations and new results from chlorine-36 studies, which relate to potential fast paths of water flow in the unsaturated zone.

In April 2000, the Board released a report to the U.S. Congress and the Secretary of Energy summarizing the Board's activities from January to December 1999. The report focused on the Board's review of the Department's *Viability Assessment of a Repository at Yucca Mountain*, investigations in the unsaturated and saturated zones, repository and waste package designs, and performance assessment activities.

The Board also sent three letters to OCRWM: in February, on the Draft Environmental Impact Statement; in March, on the proposed revision to the Yucca Mountain site suitability guidelines, and a second letter in March, on comments resulting from the Board's January 2000 meeting.

The Board will hold a meeting of its Waste Management Systems Panel in Idaho Falls, Idaho, on July 10-11, 2000. The topics will focus on transportation and Naval spent fuel.

Information about the Board and its activities can be found on the Board's website at ***http://www.nwtrb.gov.*** To view a copy of the Board's report and letters, visit the Board's website or contact the Nuclear Waste Technical Review Board at 2300 Clarendon Boulevard, Suite 1300, Arlington, Virginia 22201, telephone (703) 235-4473. ■



Schematic Diagram of the Groundwater Transport Pathways for Dose to Humans

Yucca Mountain Tours

The Yucca Mountain Site Characterization Project conducts tours of the Yucca Mountain site for interested parties, so they can observe our work first-hand. More than 1,700 tours of Yucca Mountain have been conducted since 1991 for more than 41,000 guests.

"We are committed to keeping the public informed about the progress we're making on our studies of Yucca Mountain, and one of the cornerstones of our public outreach effort is our tour program," says OCRWM Director Dr. Ivan Itkin.

Last year, some 4,500 visitors toured Yucca Mountain, including the general public, elected officials, representatives from regulatory agencies, scientists and utility representatives from the U.S. and other countries, members of the news media, and people who belong to a variety of clubs and organizations.

Field trips to the mountain are also conducted for students in sixth grade through college, as well as for teachers at all levels.

Special public tours are held at least six times a year for Nevada residents. Capacity crowds fill large tour buses that travel to the site to spend an entire day at Yucca Mountain. Tour visitors gather early in the morning at the Science Centers in Las Vegas, Beatty and Pahrump, Nevada, to travel to Yucca Mountain. They travel to the mountain's

Las Vegas Mayor Goodman and Congressman Bilbray tour the YMP Facilities

Continued on page 10

Yucca Mountain Tours - *continued*

crest to learn how Yucca Mountain was formed and to observe the surrounding environment. Participants walk underground, into the Exploratory Studies Facility, to see how scientists are conducting experiments to understand the effects that water, heat, radiation and seismic activity would have on the potential repository.

Throughout the day, tour guests have the opportunity to speak to and ask questions of the scientists and engineers who are studying Yucca Mountain. Feedback from these tour guests indicates that the vast majority are impressed by the extent of the science conducted at Yucca Mountain and feel they have a much better understanding of the issues surrounding nuclear waste disposal.

Many public officials have visited the site over the years, including Department of Energy Secretary Bill Richardson, Nevada Governor Kenny Guinn, Las Vegas Mayor Oscar Goodman, members of Congress and congressional staff, State legislators, as well as numerous foreign delegations. Yucca Mountain has also been the topic of several national news stories by reporters from all three major networks, as well as CNN and a crew from "60 Minutes."

Technical experts and political figures from 13 countries have come to learn firsthand about the Yucca Mountain Project's research findings in the areas of hydrology, geology, engineering, and ecology. "All are extremely pleased that so many individuals are interested in the work being done at Yucca Mountain," said OCRWM Director Itkin. "We are proud to share with the national and international community the progress we are making toward decisions on site recommendation," he added.

If you are interested in touring Yucca Mountain, contact the Yucca Mountain Project at 1-800-225-6972.■

Panoramic view of the Southern end of Yucca Mountain from the Crest

OCRWM Events Calendar
July 2000

SAT/SUN	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1 2	3	4	5	6	7
8 9	NRC/TRB Panel Meeting on Waste Management Idaho Falls, ID 10	11	12	13	14
15 16	17	NRC/ACNW Meeting San Antonio, TX 18	19	20	21
22 NARUC Summer Committee MTG Los Angeles, CA 23	24	25	26	27	28
29 30	31				

OCRWM-sponsored meeting codes:

(P) Public Participation **(O)** Open to the public **[Name]** OCRWM Speaker

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OCRWM Events Calendar
August 2000

SAT/SUN	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
		NWTRB Full Board Meeting Carson City, NV →			
		1	2	3	4
5 / 6	7	8	9	10	11
12 / 13	14	15	16	17	18
19 / 20	21	22	23	24	25
26 / 27	29	DOE/NCR Appendix 7 Meeting Disruptive Events PMR (Seismic and Igenious Activities Las Vegas, NV →			
		30	31		

OCRWM-sponsored meeting codes:

(P) Public Participation **(O)** Open to the public **[Name]** OCRWM Speaker

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