# Nuclear Waste Disposal

## Proposed Appropriation Language

*For nuclear waste disposal activities to carry out the purposes of Public Law 97-425, as amended, including the acquisition of real property or facility construction or expansion, $161,000,000 to remain available until expended and to be derived from the Nuclear Waste Fund. Provided, That none of the funds herein appropriated may be: (1) used directly or indirectly to influence legislative action on any matter pending before Congress or a State legislature or for lobbying activity as provided in 18 U.S.C. 1913; (2) used for litigation expenses; or (3) used to support multi-State efforts or other coalition building activities. Provided further, All proceeds and recoveries realized by the Secretary in carrying out activities authorized by the Nuclear Waste Policy Act of 1982 in Public Law 97-425, as amended, including but not limited to, any proceeds from the sale of assets shall be available without further appropriation and shall remain available until expended .*

Note.—A regular 2003 appropriation for this account had not been enacted at the time the budget was prepared; therefore, this account is operating under a continuing resolution (P.L. 107–229, as amended). The amounts included for 2003 in this budget reflect the Administration's 2003 policy proposals.

## Explanation of Change

The FY 2004 budget proposes to eliminate $2.5 million provided to the State of Nevada to conduct scientific oversight responsibilities; and $6.0 million provided to the affected units of local governments to conduct appropriate activities as pursuant to the Nuclear Waste Policy Act of 1982, Public Law 97-425, as amended.

# Office of Civilian Radioactive Waste Management

## Executive Summary

## Mission

The mission of the Office of Civilian Radioactive Waste Management (OCRWM), as established by the Nuclear Waste Policy Act of 1982, as amended, is to implement the Federal policy for permanent geologic disposal of commercial spent nuclear fuel and high-level radioactive waste resulting from the Nation's atomic energy defense activities. This waste must be safely isolated to minimize the risk to human health and the environment. Disposition of these materials in a geologic repository is necessary to maintain our energy options and national security, to support a cleanup of our weapons sites, to continue operation of our nuclear-powered vessels, and to advance our international non-proliferation goals.

## Goals and Objectives

The Program's long-term goal remains repository operations by 2010, thereby addressing our Nation's need to isolate, secure, and safely dispose of spent nuclear fuel and high-level waste in a deep underground geologic repository at Yucca Mountain, Nevada.

With the U.S. Congress approval of the Yucca Mountain site in July 2002, the Program will now focus its efforts on licensing, building, and operating the repository facilities and transportation system needed to accept, ship, and dispose of waste. The Program is shifting its near-term approach by focusing resources to meet the Nuclear Regulatory Commission's (NRC) licensing expectations provided within 10 CFR 63: "Disposal of High-level Radioactive Waste in a Proposed Repository at Yucca Mountain, Nevada."

### Departmental Goal

The OCRWM Program is part of the Department's Environmental Quality (EQ) Strategic Objective. As part of the overall strategy to meet the EQ goal, the Secretary has assigned one DOE strategic objective (EQ2) to RW-1. OCRWM has identified two Program Strategic Performance Goals (EQ2-1 and EQ2-2) for that objective.

### Strategic Objective

**EQ2:** Obtain requisite licenses, construct and, in 2010, begin acceptance of spent nuclear fuel and high-level radioactive wastes at the repository. (RW)

**Program Strategic Performance Goals**

**EQ2-1:** Obtain a repository construction authorization from the Nuclear Regulatory Commission in 2008.

**EQ2-2:** Develop the national and Nevada transportation infrastructure to support the anticipated shipment of spent nuclear fuel and high-level radioactive waste to the repository, beginning in 2010.

## Repository License Application

The Program plans to submit a license application to the NRC by December 2004, beginning the rigorous scientific and technical review process before a repository construction authorization is granted. The NRC will determine whether or not the proposed repository design and concept of operations will meet NRC's licensing expectation provided within 10 CFR 63 and outlined by "Yucca Mountain Review Plan" (NUREG-1804).

- **Immediate Funding Needs**

  - Document pre-closure designs and concept of operations and analyze post-closure safety to support a safety analysis report to the NRC by March 2004.

  - Finalize repository surface designs and phase surface facility concepts by March 2004.

  - Implement a license support network in accordance with 10 CFR 2 by June 2004 to facilitate the NRC review.

  - Integrate current repository sub-surface panel construction layout sub-system models to integrated total systems performance assessment model for license application by 2004.

  - Complete all formal document requirements and activities related to the submission of the License Application to the NRC by September 2004.

## Transportation System to 2010

To receive, possess, and emplace by 2010, the Program will first implement a transportation program capable of a nominal 175 truck and rail spent fuel and high-level waste shipment's per year over a 25-year transportation campaign. This campaign would continue to maintain and improve upon our Nation's safe nuclear materials transportation record, and would recognize the particular interest of the State of Nevada, as the host state to a repository.

- **Immediate Funding Needs**

  - Start procurement efforts for transportation services and equipment to encourage cask manufacturers and equipment vendors to prepare for an increased national shipping campaign.

  - Conduct the Environmental Impact Statement (EIS) process to identify Nevada rail corridors and prepare the Draft EIS.

  - Restart transportation outreach, planning, and coordination activities with particular attentions to the needs of Nevada as the host-state.

  - Evaluate the benefits and costs of shipment implementation and associated institutional activities to mitigate national shipping campaign impacts and facilitate the efficient movement of spent nuclear fuel and high-level radioactive waste.

## Phased Repository Construction

The NRC's construction authorization is expected by 2008. The Program will then accelerate building the necessary surface and required subsurface facilities to attain a license amendment to receive, possess, and emplace spent nuclear fuel and high-level radioactive waste at a repository facility at Yucca Mountain meeting our 2010 Program goal.

To begin operations by 2010, a phased or step-wise development approach for building repository surface and subsurface facilities will be implemented. Originally, the Program had planned to complete all of the repository's surface facilities and a large portion of its underground facilities before the first shipment of waste to the repository. Under the phased development approach, the Program will still seek a full license from the NRC to construct the repository and, later, a full license to emplace waste. However, actual construction will be a step-wise process building those repository surface and underground facilities in modules and panels. This strategy, which lowers the initial investment risks by spending less before receiving an operating license, will allow us to learn from small-scale operating experience as we build more of the repository, and remain flexible to access future technology improvements.

## Alternative Funding Proposal

To enable operations by 2010 funding between 2005–2010 will require an average of $1.3 billion per year from the Nuclear Waste Fund and the Defense Nuclear Waste appropriations. This is significantly higher than previous annual appropriations. There is currently in excess of $14 billion in the Nuclear Waste Fund, and the program will continue to collect over $1.5 billion annually through fees and interest. The Defense Nuclear Waste Appropriations will also increase significantly if waste is to be accepted from sites in 2010. Having the funds does not ensure, however, that adequate appropriations will be provided.

The program will also increase its capital asset planning. The program will work closely with the Office

of Management and Budget to identify, acquire, and manage the funding requirements for the construction phase efficiently, recognizing that multi-year investments are necessary to complete useful segments and to propose budget authority and budget obligation schedules accordingly.

## Reduction of Total System Life Cycle Costs

The Department is currently evaluating potential changes to determine whether it is practicable to reduce total system life cycle costs by as much as $10 billion. For example, the Department has recently implemented a cost reduction and systems enhancement program to identify any significant cost savings in the repository project in high cost areas, such as waste package costs, i.e., waste package design, fabrication, and materials. The Department is evaluating items such as the wall thickness and the third lid on the waste package. Value engineering studies, on topics such as the use of multi-purpose canisters (MPCs), the use of titanium drip shields, and a reduction in the number of types of standard waste packages, may also identify significant cost savings. Application of a risk-informed approach, wherein the relative significance or contribution of an item to safety, waste isolation, or reduction of uncertainty is evaluated, may also lead to identification of significant cost savings.

In addition, the Department is evaluating waste acceptance approaches and criteria that may reduce costs that the repository "customers," particularly the Department's EM Program, incur prior to transfer of the spent nuclear fuel and high-level radioactive wastes to the OCRWM Program.

## Cost Reductions and Systems Enhancements

The Cost Reductions and Systems Enhancements program focuses on activities to increase confidence in the technical basis for long-term performance of the repository, help mitigate potential regulatory and funding risk to the program, and reduce cost. This benefits not only the Office of Civilian Radioactive Waste Program waste disposal program but also may support broader DOE efforts to find solutions for waste minimization, waste acceptance, and the ultimate disposal of high level nuclear waste and spent fuel in the geologic repository.

Increased confidence in repository performance may result in the following benefits: 1) reduction of schedule impacts assuring no delay in the licensing process (an insurance policy); 2) placing more reliance on the natural system thus reducing the need for a multitude of costly engineered barriers; and 3) reduction in the time to both first emplacement of waste and completion of waste receipt in the repository. Every year of delay can cost the program millions to billions of direct and indirect costs. Increased confidence includes a better understanding of the length of time to and magnitude of peak dose, a more in-depth understanding of the physical processes of the natural system, and closure on some of the many issues raised by various constituencies of the program.

Utilization of new and emerging technologies may not only enhance repository performance but also reduce the cost of existing components in the current design to include waste package and multiple barrier materials potentially saving billions of dollars. A systems analysis of waste acceptance criteria has the potential to reduce the cost of DOE wide waste processing and conditioning of waste in order to

comply with the existing waste acceptance criteria of the program.

## Land Withdrawal

Because of the long-term nature of the project, the need to ensure the territorial integrity, security, and isolation of the site, and in satisfaction of Nuclear Regulatory Commission licensing requirements, the Administration plans to submit a proposal to withdraw permanently from settlement, sale, location, or entry under some or all of the general land laws, certain lands comprising and contiguous to the Yucca Mountain geologic repository operations area.

## Program Budget Request

To maintain the schedule to begin waste acceptance at a geologic repository by 2010, it is imperative that the budget request of $ 591 million be approved. Funding below this effort will result in the Program not being able to meet the 2010 milestone. Achievement of the Program's Strategic Objective EQ2 depends heavily on funding continuity and sufficiency. To provide funding for the Program's activities, our FY 2004 appropriation request draws upon two sources: the Nuclear Waste Disposal Appropriation and the Defense Nuclear Waste Disposal Appropriation, as follows:

| Appropriation | OMB Budget Request |
|---|---|
| Nuclear Waste Fund | 161,000,000 |
| Defense Nuclear Waste Fund | 430,000,000 |
| Total, FY 2004 Request | $ 591,000,000 |

_____ Date: _____

Margaret S. Y. Chu, Director
Office of Civilian Radioactive
Waste Management, RW-1

# Nuclear Waste Disposal

## Civilian Radioactive Waste Management Program

## Program Mission

The mission of the Office of Civilian Radioactive Waste Management (OCRWM), as established by the Nuclear Waste Policy Act of 1982, as amended, is to implement the Federal policy for permanent geologic disposal of commercial spent nuclear fuel and high-level radioactive waste resulting from the Nation's atomic energy defense activities, in order to protect the public health and the environment. Disposition of these materials in a geologic repository is necessary to maintain our energy options and national security, to support cleanup of our weapon sites, to continue operation of our nuclear-powered vessels, and to advance our international non-proliferation goals. This mission requires OCRWM to acquire integrated disposal and transportation capabilities.

## Strategic Objective

**EQ2:** Obtain requisite licenses, construct and, in 2010, begin acceptance of spent nuclear fuel and high-level radioactive wastes at the repository. (RW)

**Program Strategic Performance Goals**

**EQ2-1:** Obtain a repository construction authorization from the Nuclear Regulatory Commission in 2008.

**EQ2-2:** Develop the national and Nevada transportation infrastructure to support the anticipated shipment of spent nuclear fuel and high-level radioactive waste to the repository, beginning in 2010.

**Performance Indicator**

- Meeting RW Program milestones. (RW)

### Annual Performance Results and Targets for EQ2-1

| FY 2002 Results | FY 2003 Updated Targets | FY 2004 Target |
|---|---|---|
| • Submit a Final Environmental Impact Statement to the President as required by the Nuclear Waste Policy Act. (EQ2-1/FMFIA-nuclear waste management) (MET GOAL)<br>• Submit a Site Recommendation Report to the President. (EQ2-1/FMFIA-nuclear waste management) (MET GOAL)<br>• Begin development of updated Total System Life Cycle Cost and Fee Adequacy reports. (EQ2-1) (MET GOAL) | • Complete additional testing and analyses required to support license application design. (EQ2-1)<br>• Complete development of repository conceptual design and request Acquisition Executive approval to start preliminary design, which will be used in the license application. (EQ2-1)<br>• Complete and issue updated Total System Life Cycle Cost and Fee Adequacy reports in preparation for license application. (EQ2-1) | • Complete the safety analyses for Department-owned spent nuclear fuel and high-level radioactive waste, Naval spent fuel, and plutonium waste forms for the license application.<br>• Respond to major Nuclear Regulatory Commission "key technical issues" necessary to support the license application.<br>• Complete required elements of the preliminary design for the waste package, surface facilities, and subsurface facilities, in support of the license application to the Nuclear Regulatory Commission.<br>• Complete the Licensing Support Network (LSN) and certification consistent with the requirements of 10 CFR Part 2, Subpart J, at least six months prior to submitting the license application.<br>• Complete draft of license application for submittal to the Nuclear Regulatory Commission. |

### Annual Performance Results and Targets for EQ2-2

| FY 2002 Results | FY 2003 Updated Targets | FY 2004 Target |
|---|---|---|
| • Issue draft request for proposals for waste acceptance and transportation services. (EQ2-2) (MET GOAL)<br>• Issue Nuclear Waste Policy Act Section 180(c) Notice of Revised Proposed Policy and Procedures for public comment. (EQ2-2) (NOT MET) | • Acquire transportation planning services. (EQ2-2)<br>• Develop and issue the OCRWM Strategic Transportation Plan. (EQ2-2) | • Obtain Acquisition Executive approval and award contract(s) to acquire long lead-time transportation casks. (EQ2-2)<br>• Issue Transportation Project Plan. (EQ2-2) |

## Significant Accomplishments and Program Shifts

Congress authorized the Department of Energy to determine whether Yucca Mountain, Nevada, is a scientifically suitable site for a permanent underground geologic repository for spent nuclear fuel and high-level radioactive waste. After over 20 years of scientific study ― called Site Characterization ― the President notified Congress in February 2002 that Yucca Mountain, Nevada, is qualified to take the next steps required under the Nuclear Waste Policy Act ―*the start of a rigorous scientific and technical review through the formal licensing procedures of the Nuclear Regulatory Commission*.

With the U.S. Congress approval of the Yucca Mountain site in July 2002, the Program will now focus its efforts on licensing, building, and operating the repository facilities and transportation system needed to accept, ship, and dispose of waste. The Program is shifting its near-term approach by focusing resources to meet the Nuclear Regulatory Commission's (NRC) licensing expectations provided within 10 CFR 63: "Disposal of High-level Radioactive Waste in a Proposed Repository at Yucca Mountain, Nevada."

## Program FY 2004 Objectives

**Consistent with the Departmental and Program objectives, the Yucca Mountain Project's main focus in FY 2004 will be on finalizing the technical products required to develop a license application for construction of the potential repository. The design, performance assessment, safety analyses, and technical data in the license application must be sufficient for the Nuclear Regulatory Commission to conduct an independent review and reach a decision to issue a construction authorization. The license application must present a defensible position that the repository can be constructed, operated, and closed without unreasonable risk to the health and safety of the public. The Nuclear Regulatory Commission has issued a site-specific licensing regulation (Title 10 of the Code of Federal Regulations Part 63, or 10 CFR 63) that is risk-informed and performance-based. It requires the Department of Energy to demonstrate in the license application that the repository will meet the specified performance objectives while it is being operated (preclosure) and after it is closed (postclosure).**

Preparation of the license application and supporting documents builds on the documentation completed for site characterization work supporting the site recommendation. The Nuclear Regulatory Commission has also issued a Yucca Mountain Review Plan Draft Report for comment, which defines the basis for the Commission's licensing review and expectations for the form and content of the license application. The development and review of the license application document began in FY 2002 will culminate in submission of the license application in early FY 2005.

The documentation referenced by or supporting the license application will be made available to the Nuclear Regulatory Commission in electronic format through the Licensing Support Network as required in 10 CFR 2, Subpart J. The license application will be supported by technical documents that establish the basis for the safety case for preclosure and postclosure performance. These documents include:

- A total system performance assessment document supported by analysis and model reports that

provide the bases for postclosure compliance.

- A preclosure safety analysis document that provides the bases for preclosure compliance.
- System description documents and engineering analyses that establish the design basis.
- A site description document that describes the characteristics of the Yucca Mountain site.
- Any additional documentation required by the Nuclear Regulatory Commission for it's adoption of the Final Environmental Impact Statement.

In FY 2004 work will focus on the development of the license application with emphasis on the design and the performance assessment for license application.

To develop a system ready to ship waste in 2010, the Program will accelerate efforts that were delayed during the site characterization period. The main focus in FY 2004 will be to procure an initial set of long lead time transport casks systems and equipment, develop operational plans, and implement a major effort to work with State, Tribal and local jurisdictions across the country in order to facilitate timely transportation of spent fuel and high-level radioactive waste. The transportation system will require an adequate fleet of transportation cask systems, a cask maintenance facility, operational protocols and procedures, site service plans with utilities, security procedures, inspection and site loading procedures, repository waste receipt processes, and robust emergency response or management capabilities.

**National Transportation**

To develop a system ready to begin shipping waste in 2010, the Program will accelerate efforts that were delayed during the site characterization period. The main focus in FY 2004 will be to procure five long lead time transport casks systems and equipment, develop operational plans, and implement a major effort to work with State, Tribal and local jurisdictions across the country in order to facilitate timely transportation of spent fuel and HLW. The transportation system will require an adequate fleet of transportation cask and transportation systems, shipping cask maintenance capabilities, operational protocols and procedures, site service plans with waste owners/generators, security procedures, site loading procedures, repository waste receipt processes, and robust emergency response or management capabilities.

Under the Nuclear Waste Policy Act the Department is also directed to provide training assistance to States through whose jurisdictions shipments will be made to Yucca Mountain. In FY 2004 the program will determine the final grant process for providing assistance to States and Tribes under Section 180(c) of the NWPA. In order to help address issues related to the transportation of radioactive waste and to provide information to the public and solicit feedback, the transportation activity also involves cooperative agreements and/or interactions with organizations representing State, Tribal, local, professional, technical, and industry interests.

**Nevada Transportation**

The national rail system has been used for the last 25 years to ship radioactive waste safely across the country. However, no rail link exists between the national rail system and the Yucca Mountain site. The

Program plans to build a rail line between the existing rail system and Yucca Mountain at an estimated cost of $300 million to $1 billion, depending on the corridor and alignment selected. In FY 2004 the Program will initiate the conceptual design process, develop the draft Environmental Impact Statement for the rail alignment, and initiate the land acquisition planning.

**Waste Acceptance**

The following activities will be required for the Waste Acceptance budget element: the development of plans for achieving the legal and physical transfer of SNF and HLW to the Federal Government from the owners and generators of such SNF and HLW; the implementation of agreements with the Office of Environmental Management (EM) for the acceptance of Department-owned SNF and HLW and with the Office of Naval Reactors' Navy Nuclear Propulsion Program for acceptance of naval SNF; the development of planning assumptions and recommendations for the Department's waste acceptance policy; and supporting the transportation, storage and disposal of SNF and HLW, once accepted.

**FY 2004 Proposed Targets**

In addition to the key performance targets in the tables for EQ2-1 and EQ2-2, the following performance measures are scheduled for completion in FY 2004:

C **Repository Design & Licensing**

- < Complete the total system performance assessment postclosure report in support of the license application.

- < Complete the development and Yucca Mountain Project internal review of five license application chapters for submittal to the Nuclear Regulatory Commission for authorization to construct a repository.

C **Waste Acceptance, Storage and Transportation**

- < Award contract(s) to acquire transportation casks requiring an early start to be available when the repository is ready in 2010. Early start would be needed for casks with unique features or materials, or casks requiring significant licensing and design changes to handle the anticipated SNF characteristics.

- < Finalize cask fleet requirements by determining the number and types of casks and support equipment required to begin shipping fuel from generators to the repository by 2010.

- < Conduct NEPA public hearings on scoping for the Nevada rail alignment EIS. NEPA hearings are formal public meetings conducted to solicit public input into the development of an environmental impact statement (EIS) for a specific rail alignment in Nevada. The "Nevada rail alignment" refers to the specific location of a rail line within an established corridor.

# Funding Profile

( Dollars in Thousands )

| | FY 2002 Comparable Appropriation | FY 2003 Comparable Request | FY 2004 Budget Request | $ Change | % Change |
|---|---|---|---|---|---|
| OCRWM Program Fund: | | | | | |
| Yucca Mountain Site Characterization (Phase 1) | 296,681 | 0 | 0 | 0 | 0.0% |
| Repository Design & Licensing (Phase 2A) | 0 | 477,922 | 419,027 | -58,895 | -12.3% |
| Waste Acceptance, Storage & Transportation | 4,103 | 30,200 | 73,100 | +42,900 | +142.1% |
| Program Management & Integration | 18,011 | 19,691 | 23,703 | +4,012 | +20.4% |
| Program Direction & Support Services | 55,916 | 62,989 | 75,170 | +12,181 | +19.3% |
| Total, Program Budget Authority | 374,711 | 590,802 | 591,000 | +198 | 0.0% |
| Funding Sources: | | | | | |
| Nuclear Waste Disposal (NWD) | | | | | |
| Nuclear Waste Fund, First Repository | 39,000 | 212,813 | 85,830 | -126,983 | -59.7% |
| Nuclear Waste Fund, Program Direction | 55,916 | 62,989 | 75,170 | +12,181 | +19.3% |
| Total, Nuclear Waste Disposal | 94,916 | 275,802 | 161,000 | -114,802 | -41.6% |
| Defense Nuclear Waste Disposal (DNWD) | 279,795 | 315,000 | 430,000 | +115,000 | +36.5% |
| Total, Defense Nuclear Waste Disposal | 279,795 | 315,000 | 430,000 | +115,000 | +36.5% |
| Total, Funding Sources | 374,711 | 590,802 | 591,000 | +198 | 0.0% |
| Additional net budget authority to cover the cost of fully accruing retirement (non-add) | (2,278) | (2,343) | 0 | (2,343) | -100.0% |

Public Law Authorization:

P.L. 97-425, "Nuclear Waste Policy Act" (1982)

P.L. 100-203, "Nuclear Waste Policy Amendments Act" (1987)

# Five-Year Funding Profile

| | FY 2002 Comparable Appropriation | FY 2003 Comparable Request | FY 2004 Request | FY 2005 Request | FY 2006 Request |
|---|---|---|---|---|---|
| | ( dollars in thousands ) | | | | |
| Yucca Mountain Site Characterization (Phase 1) | | | | | |
| Suitability/Licensing & Performance Assessment | 66,052 | 146,896 | 0 | 0 | 0 |
| Core Science | 71,373 | 71,320 | 0 | 0 | 0 |
| Design and Engineering | 71,710 | 128,465 | 114,217 | 122,585 | 116,338 |
| Nevada Transportation | 0 | 13,000 | 0 | 0 | 0 |
| National Environmental Policy Act | 1,600 | 1,600 | 1,100 | 1,100 | 1,100 |
| Operations/Construction | 33,960 | 54,550 | 53,000 | 0 | 0 |
| Project Management | 32,145 | 40,250 | 40,250 | 49,400 | 50,400 |
| External Oversight and Payments Equal to Taxes | 19,841 | 19,841 | 11,341 | 11,341 | 11,341 |
| Repository Design & Licensing (Phase 2A) | | | | | |
| Regulatory and Licensing(FY 2002/2003: Suitability/Licensing) | 0 | 0 | 118,579 | 65,000 | 63,500 |
| Testing and Performance Analysis(FY 2002/2003: Core Science) | 0 | 0 | 55,540 | 45,000 | 48,400 |
| Cost Reductions and Systems Enhancements | 0 | 2,000 | 25,000 | 30,000 | 35,000 |
| Site Operations (FY 2005) | 0 | 0 | 0 | 59,795 | 49,791 |
| Repository Construction (FY 2005) | 0 | 0 | 0 | 157,219 | 167,066 |
| Total, Yucca Mountain (Phase 1 & 2A) | 296,681 | 477,922 | 419,027 | 541,440 | 542,936 |
| Waste Acceptance, Storage and Transportation | | | | | |
| Transportation | 1,938 | 25,272 | 65,000 | 376,180 | 411,907 |
| National Transportation | 1,938 | 25,272 | 47,000 | 270,680 | 152,907 |
| Nevada Transportation | 0 | 0 | 18,000 | 105,500 | 259,000 |
| Waste Acceptance | 1,615 | 3,328 | 6,300 | 4,400 | 4,500 |
| Project Management | 550 | 1,600 | 1,800 | 7,700 | 12,400 |
| Total, Waste Acceptance, Storage & Transportation | 4,103 | 30,200 | 73,100 | 388,280 | 428,807 |
| Program Management & Integration | | | | | |
| Quality Assurance | 6,400 | 6,918 | 10,500 | 22,278 | 22,724 |
| Program Management | 6,056 | 7,521 | 7,971 | 10,620 | 14,400 |
| Human Resources & Administration | 5,555 | 5,252 | 5,232 | 8,434 | 10,905 |
| Subtotal, Program Management & Integration | 18,011 | 19,691 | 23,703 | 41,332 | 48,029 |
| Program Direction | 55,916 | 62,989 | 75,170 | 84,094 | 87,312 |
| Total, Program Integration & Program Direction | 73,927 | 82,680 | 98,873 | 125,426 | 135,341 |
| Total, Program Budget Authority | 374,711 | 590,802 | 591,000 | 1,055,146 | 1,107,084 |
| Program Budget Authority: | | | | | |
| Nuclear Waste Disposal | | | | | |
| Nuclear Waste Fund, First Repository | 39,000 | 212,813 | 85,830 | 431,052 | 359,772 |
| Nuclear Waste Fund, Program Direction | 55,916 | 62,989 | 75,170 | 84,094 | 87,312 |
| Total, Nuclear Waste Disposal | 94,916 | 275,802 | 161,000 | 515,146 | 447,084 |
| Defense Nuclear Waste Disposal | | | | | |
| Defense Nuclear Waste Disposal | 279,795 | 315,000 | 430,000 | 540,000 | 660,000 |
| Total, Defense Nuclear Waste Disposal | 279,795 | 315,000 | 430,000 | 540,000 | 660,000 |
| Total, Program Budget Authority | 374,711 | 590,802 | 591,000 | 1,055,146 | 1,107,084 |

# Projected Receipts and Funding [a]

## Effective Yield

| | FY2002 | FY2003 | FY2004 | FY2005 | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 |
|---|---|---|---|---|---|---|---|---|---|
| | ( dollars in millions ) | | | | | | | | |
| One mill/kWh Fee [b] | 734 | 737 | 743 | 749 | 754 | 757 | 767 | 767 | 764 |
| One-time Fee | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Subtotal | 734 | 737 | 743 | 749 | 754 | 757 | 767 | 767 | 764 |
| Investment | 687 [c] | 731 [d] | 794 [d] | 859 [d] | 914 [d] | 972 [d] | 1,026 [d] | 1,073 [d] | 1,124 [d] |
| Total Income | 1,421 | 1,468 | 1,537 | 1,608 | 1,668 | 1,729 | 1,793 | 1,840 | 1,888 |
| Program Budget Authority: | | | | | | | | | |
| Nuclear Waste Disposal | | | | | | | | | |
| Nuclear Waste Fund, First Repository | 39 | 213 | 86 | 431 | 360 | 351 | 883 | 938 | 767 |
| Nuclear Waste Fund, Program Direction | 56 | 63 | 75 | 84 | 87 | 92 | 102 | 106 | 110 |
| Rescission | | | | | | | | | |
| Total, Nuclear Waste Disposal | 95 | 276 | 161 | 515 | 447 | 443 | 985 | 1,044 | 877 |
| Defense Nuclear Waste Disposal | | | | | | | | | |
| Defense Nuclear Waste Disposal | 280 | 315 | 430 | 540 | 660 | 660 | 660 | 600 | 660 |
| H.R. 4733: Restoration of Funds | | | | | | | | | |
| Total, Defense Nuclear Waste Disposal | 280 | 315 | 430 | 540 | 660 | 660 | 660 | 600 | 660 |
| Total, Program Budget Authority | 375 | 591 | 591 [e] | 1,055 [e] | 1,107 [e] | 1,103 [e] | 1,645 [e] | 1,644 [f] | 1,537 [f] |

[a] Fee and investment income projections are subject to change based on the outcome of pending litigation and prevailing market conditions.

[b] Estimated fee income for FY 2002-2010 is based on EIA projections as of December 13, 2002, with adjustments made for potential litigation settlements as of August 16, 2002, i.e., all utilities are likely to accept PECO-type offer.

[c] Estimated FY 2002 investment income is based on projected effective yield earnings through September 30, 2002.

[d] The projected values consist of anticipated effective interest earnings on all securities from the date of purchase. DRI-McGraw Hill forecasts are used for future interest rates.

[e] The FY 2004-2008 OCRWM Program numbers are based on the CFO Program Budget Decision 180 (Secretarial Decision), August 16, 2002.

[f] OCRWM Program Planning Level (PPL) projection.

# Funding by Site [a]

(dollars in thousands)

| | FY 2002 | FY 2003 | FY 2004 | $ Change | % Change |
|---|---|---|---|---|---|
| Chicago Operations Office | | | | | |
| Argonne National Laboratory | 2,752 | 2,578 | 2,501 | -77 | -3.0% |
| Oakland Operations Office | | | | | |
| Lawrence Berkeley Laboratory | 12,118 | 12,817 | 12,048 | -769 | -6.0% |
| Lawrence Livermore National Laboratory | 17,149 | 18,029 | 16,983 | -1,046 | -5.8% |
| Total, Oakland Operations Office | 29,267 | 30,846 | 29,031 | -1,815 | -5.9% |
| Albuquerque Operations Office | | | | | |
| Sandia National Laboratory | 14,319 | 14,382 | 13,663 | -719 | -5.0% |
| Los Alamos National Laboratory | 12,591 | 12,785 | 12,146 | -639 | -5.0% |
| Total, Albuquerque Operations Office | 26,910 | 27,167 | 25,809 | -1,358 | -5.0% |
| Nevada Operations Office | | | | | |
| Nevada Operations Office [b] | 228,814 | 408,474 | 352,904 | -55,570 | -13.6% |
| Nevada Test Site | 7,550 | 7,578 | 7,888 | +310 | +4.1% |
| Nevada (Yucca Mountain Project Office) | 36,164 | 40,655 | 42,531 | +1,876 | +4.6% |
| Total, Nevada Operations Office | 272,528 | 456,707 | 403,323 | -53,384 | -11.7% |
| Oak Ridge Operations Office | 491 | 491 | 491 | 0 | 0.0% |
| Oak Ridge National Laboratory | 150 | 537 | 495 | -42 | -7.8% |
| Total, Oak Ridge Operations Office | 641 | 1,028 | 986 | -42 | -4.1% |
| Richland Operations Office | | | | | |
| Pacific Northwest Laboratory | 973 | 1,351 | 1,256 | -95 | -7.0% |
| Washington Headquarters | 41,640 | 71,125 | 128,094 | +56,969 | 80.1% |
| Total, Program | 374,711 | 590,802 | 591,000 | +198 | 0.03% |

[a] On December 20, 2002, the National Nuclear Security Administration (NNSA) disestablished the Albuquerque, Oakland, and Nevada Operations Offices, renamed existing area offices as site offices, established a new Nevada Site Office, and established a single NNSA Service Center to be located in Albuquerque. Other aspects of the NNSA organizational changes will be phased in and consolidation of the Service Center in Albuquerque will be completed by September 30, 2004. For budget display purposes, DOE is displaying non-NNSA budgets by site in the traditional pre-NNSA organizational format.

[b] FY 2002-2003 includes Financial Assistance to the State of Nevada and Affected Units of Local Government; and FY 2002-2004 includes funding for contracts administered in Nevada ( i.e., Management and Operating Contractor, USGS, National Academy of Sciences, universities, etc.).

# Site Description [a]

## Argonne National Laboratory

In support of the Design and Engineering budget element, Argonne National Laboratory conducts waste form testing. The laboratory is also the custodian for new spent fuel approved test material.

## Lawrence Berkeley National Laboratory

In support of the Core Science budget element, Lawrence Berkeley National Laboratory (LBNL) conducts unsaturated zone flow and transport modeling, thermal hydrologic modeling activities, geophysics testing, and supports drift-scale testing. LBNL also performs the seepage tests in the exploratory studies facility alcoves and niches. LBNL supports the abstraction activities needed to conduct the total system performance assessment in support of the license application.

## Lawrence Livermore National Laboratory

In support of the Core Science budget element, Lawrence Livermore National Laboratory (LLNL) conducts experiments and modeling activities needed for the repository design and to predict responses of the engineered and natural barrier systems to the heat generated by radioactive waste. The experiments include the drift-scale tests in the exploratory studies facility (ESF) and the heater tests in the cross drift. In support of the Design and Engineering budget element, LLNL conducts testing and modeling of the waste package environment, waste package materials and waste forms. LLNL also supports the abstraction activities needed to conduct the total system performance assessment in support of the license application.

## Sandia National Laboratory

In support of the Core Science budget element, Sandia National Laboratories conducts in-situ monitoring in the exploratory studies facility and in the cross drift, and performance confirmation testing. The laboratory conducts geoengineering and rock mechanics studies, and backfill analyses in support of the Design and Engineering budget element. The laboratory also supports the Suitability/Licensing and Performance Assessment budget element with performance assessment modeling. In the area of transportation, the laboratory provides technical support on safety and physical protection issues, standards development, and operations.

## Los Alamos National Laboratory

In support of the Core Science budget element, Los Alamos National Laboratory (LANL) conducts geochemistry, mineralogy, and colloid transport studies. LANL conducts laboratory and field-scale

[a] On December 20, 2002, the National Nuclear Security Administration (NNSA) disestablished the Albuquerque, Oakland, and Nevada Operations Offices, renamed existing area offices as site offices, established a new Nevada Site Office, and established a single NNSA Service Center to be located in Albuquerque. Other aspects of the NNSA organizational changes will be phased in and consolidation of the Service Center in Albuquerque will be completed by September 30, 2004. For budget display purposes, DOE is displaying non-NNSA budgets by site in the traditional pre-NNSA organizational format.

transport tests, including the Busted Butte transport test, and develops radionuclide transport properties models for the unsaturated and saturated zone groundwaters at the site. LANL corroborates with the United States Geologic Survey on isotopic and groundwater chemistry investigations needed for transport models. LANL interacts with Lawrence Berkeley National Laboratory in preparation of the unsaturated-zone flow and transport process model report, and participates with Sandia National Laboratory in preparation of the saturated-zone flow and transport process model report. In support of the Operations/Construction budget element, the laboratory coordinates testing at the Yucca Mountain site, including testing in the ESF and the cross drift. LANL also supports the abstraction activities needed to conduct the total system performance assessment in support of the license application.

## Nevada Operations Office

In support of the Yucca Mountain Project and the Office of Civilian Radioactive Waste Management (OCRWM) Program Direction budget element, the Nevada Operations Office administers disbursement of external oversight and payments-equal-to-taxes (PETT) funds to affected units of government, and also administers contracts/agreements with the OCRWM Management & Operating (M&O) contractor, support services contracts and all other financial/contract agreements associated directly with Yucca Mountain Site Characterization Office.

## Nevada Test Site

In support of the Core Science and Operations/Construction budget elements at the Yucca Mountain site, the Nevada Test Site (NTS), through Bechtel Nevada, provides NTS common site support such as: logistics, fire protection, security, emergency medical services, roads/grounds maintenance, environmental operations, vehicle/construction equipment maintenance, facility maintenance, bus transportation, janitorial and refuse services, and power usage.

## Yucca Mountain Site Characterization Office in Nevada

The Yucca Mountain Site Characterization Office in Las Vegas, Nevada has the primary responsibility for the characterization of the Yucca Mountain site, and if the site is found suitable, preparing and submitting a license application to the Nuclear Regulatory Commission for construction of the repository. As the future owner and licensee of the repository, the Department of Energy develops and implements policies and strategies for the work to be completed and oversees the management and operating contractor and the United States Geological Survey in performing this work. The Yucca Mountain Site Characterization Office manages the contracts for the management and operating contractor and the support services contractors for work at Yucca Mountain.

License preparation activities include developing a description of the site; design of the repository and waste package subsystems; writing the license application; developing and implementing environmental, safety and health policies; interacting with oversight and regulatory groups; and providing the necessary management and site infrastructure to support these activities.

## Oak Ridge Institute for Science and Education

In support of the Program Management budget element, the Oak Ridge Institute for Science and Education administers undergraduate and graduate educational programs.

## Oak Ridge National Laboratory

In support of the Design and Engineering budget element, the Oak Ridge National Laboratory provides support in analyzing commercial reactor criticality data, radiochemical assays and uncanistered fuel design. The laboratory also provides technical support for the disposal criticality topical report, thermal/neutronics model and criticality analysis process report. The laboratory also provides support in standards development operations.

## Pacific Northwest National Laboratory

In support of the Design and Engineering budget element, the Pacific Northwest National Laboratory provides waste form testing support.

# Yucca Mountain Project

## Mission Supporting Goals and Objectives

### Project Mission

The mission of the Yucca Mountain Project is to manage and dispose of high-level radioactive waste (HLW) and spent nuclear fuel (SNF) in a manner that protects health, safety, and environment; enhances national and energy security; and merits public confidence.

Approval of the Yucca Mountain site for development as a repository in FY 2002 was one of a series of key technical, legal, and policy decisions that are at the core of the Office of Civilian Radioactive Waste Management's principal objective—the permanent safe disposal of spent nuclear fuel and high-level radioactive waste. The next step in the process is for the Department to develop and submit a license application to the Nuclear Regulatory Commission for authorization to construct the repository, currently planned to occur before the end of CY 2004.

### Proposed FY 2004 Targets

The Yucca Mountain Project implements the **Program Strategic Performance Goal EQ2-1**: Obtain a repository construction authorization from the Nuclear Regulatory Commission in 2008.

**Indicator:** Meeting RW Program milestones.

**Metrics:** Complete the following performance measures, which also serve as Program level-1 or level-2 milestones:

- Complete the safety analyses for Department-owned spent nuclear fuel and high-level radioactive waste, Naval spent fuel, and plutonium waste forms for the license application.
- Respond to major Nuclear Regulatory Commission "key technical issues" necessary to support the license application.
- Complete required elements of the preliminary design for the waste package, surface facilities, and subsurface facilities, in support of the license application to the Nuclear Regulatory Commission.
- Complete the Licensing Support Network (LSN) and certification consistent with the requirements of 10 CFR Part 2, Subpart J, at least six months prior to submitting the license application.

- Complete draft of license application for submittal to the Nuclear Regulatory Commission.

## FY 2004 Yucca Mountain Performance Measures

There are eight additional performance measures pending completion to meet Program Strategic Performance Goal EQ2-1:

- Complete the total system performance assessment postclosure report in support of the license application. [Scheduled for completion in FY 2004]

- Complete the development and YMP internal review of the license application chapters for submittal to the Nuclear Regulatory Commission for authorization to construct a repository. [Scheduled for completion in FY 2004]

- Complete testing and analyses required to support license application design (Program Performance Measure YMP/RW1-3.1).

- Complete the total system performance assessment postclosure report in support of the license application (YMP level-2 milestone).

- Prepare, review, and approve design for the license application for submittal to the Nuclear Regulatory Commission (Program Performance Measure YMP/RW1-3.2).

  - Prepare, review, and approve the license application design for the waste package in support of the license application to the Nuclear Regulatory Commission (FY 2004YMP level-2 milestone).

  - Prepare, review, and approve the license application design for the surface facilities in support of the license application to the Nuclear Regulatory Commission (FY 2004 YMP level-2 milestone).

  - Prepare, review, and approve the license application design for the subsurface facilities in support of the license application to the Nuclear Regulatory Commission (FY 2004 YMP level-2 milestone).

  - Complete the verification of fabrication, procurement, and construction design requirements (FY 2004 YMP Level-2 milestone).

- Complete the development and YMP internal review of the license application chapters for submittal to the Nuclear Regulatory Commission for authorization to construct a repository (Program Performance Measure RW1-3.4).

  - Complete the General Information chapter of the license application (FY 2004 YMP milestone).

- Complete the Safety Analysis Report (SAR) chapters of the license application - (FY 2004 YMP milestones).
  - SAR Chapter 1 - Repository Safety Before Permanent Closure
  - SAR Chapter 2 - Repository Safety After Permanent Closure
  - SAR Chapter 3 - Research and Development Program to Resolve Safety Questions
  - SAR Chapter 4 - Performance Confirmation Program
  - SAR Chapter 5 - Administrative and Programmatic Requirements

- Complete the Licensing Support Network and certification consistent with the requirements of 10 CFR Part 2, Subpart J at least six months prior to submitting the license application.

- Complete the acceptance of the Project Electronic Information System (FY 2004 YMP milestone).

## Significant Accomplishments and Project Shifts

In early FY 2002, the Yucca Mountain Project completed its most significant milestone to date, the preparation of the scientific and technical documentation necessary to support the technical basis for a Secretarial decision to recommend the Yucca Mountain site for development as a repository and provided the documents to the State of Nevada, affected units of government, and to the public for their review and comment. The Secretary and the President recommended the Yucca Mountain site for development as a repository.

The Department also developed a *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*. The Department held 66 public hearings in 17 counties in the vicinity of Yucca Mountain to inform residents of the area of the possible recommendation and to gather their views and comments. (Program Performance Measure YMP/RW1-1.3).

In FY 2002 the Department completed the additional scientific and engineering work identified in FY 2001 to strengthen the technical basis for a decision on the site recommendation and the license application (Program Performance Measure YMP/RW1-3.1). This completed work includes: 1) testing and analyses to further characterize and quantify the uncertainties in the assessments of the long-term performance of the repository; 2) work to evaluate modifications to the operations and/or design of the potential repository to reduce the maximum temperatures reached after closure of the repository; 3) studies of waste package materials to improve understanding of corrosion processes; and 4) work on the development of multiple lines of evidence for a safety case.

The Yucca Mountain Project completed the testing and analysis necessary to support the design and performance assessment for a site recommendation which completed our first strategic objective— the completion of the Site Characterization phase of Yucca Mountain. Starting in FY 2003, the next phase of the Yucca Mountain Project, the Repository Design and Licensing phase, requires capital funding for preliminary design.

By the end of FY 2003, the Yucca Mountain Project expects to meet the following goals and objectives:

- Complete additional testing and analyses required to support the license application design for waste package, surface and subsurface facilities.

- Complete testing data feeds for the total system performance assessment postclosure report in the license application.

- Initiate the development of selected license application chapters for submittal to the Nuclear Regulatory Commission for authorization to construct a repository.

Scientific and engineering work will continue into FY 2004 and beyond as part of the long-term performance confirmation process.

## Work Planned Subsequent to FY 2004

- Conduct Cost Reductions and Systems Enhancements investigations and analysis to enhance confidence in the repository and waste management systems.

- Complete preliminary design (FY 2005).

- Finalize and submit a license application to the Nuclear Regulatory Commission for authorization to construct a repository (Program Performance Measure YMP/RW1-3.3; FY 2005).

- Conduct technical activities to address the Nuclear Regulatory Commission's review of the license application (Program Performance Measure YMP/RW1-3.4; FY 2005 - FY 2008).

- Continue design work to develop final drawings and specifications for construction (part of Program Performance Measure YMP/RW1-3.2; FY 2005 - FY 2008).

- Conduct performance confirmation testing, monitoring, and evaluation activities, as required by the Nuclear Regulatory Commission's licensing regulations. This phase began during site characterization and will continue through repository closure.

- Conduct additional National Environmental Policy Act analyses, if required.

- Begin procuring long lead-time equipment for repository construction (YMP level-2 milestone).

- Start pre-construction activities to prepare for delivery of excavation equipment including tunnel boring machines (YMP level-2 milestone).

# Funding Schedule

(Dollars in Thousands)

| Project Budget Elements: | FY 2002 | FY 2003 | FY 2004 | $ Change | % Change |
|---|---|---|---|---|---|
| Regulatory and Licensing (FY 2002/2003: Suitability/Licensing and Performance Assessment) | 66,052 | 146,896 | 118,579 | -28,317 | -19.3% |
| Cost Reductions and Systems Enhancements | 0 | 2,000 | 25,000 | +23,000 | +1,150.0% |
| Testing and Performance Analysis (FY 2002/2003: Core Science) | 71,373 | 71,320 | 55,540 | -15,780 | -22.1% |
| Design and Engineering | 71,710 | 128,465 | 114,217 | -14,248 | -11.1% |
| Nevada Transportation [a] | 0 | 13,000 | 0 | -13,000 | -100.0% |
| National Environmental Policy Act | 1,600 | 1,600 | 1,100 | -500 | -31.3% |
| Operations/Construction | 33,960 | 54,550 | 53,000 | -1,550 | -2.8% |
| Project Management | 32,145 | 40,250 | 40,250 | 0 | 0.0% |
| External Oversight and Payments Equal to Taxes | 19,841 | 19,841 | 11,341 | -8,500 | -42.8% |
| TOTAL, YUCCA MOUNTAIN PROJECT | 296,681 | 477,922 | 419,027 | -58,895 | -12.3% |

[a] Transferred to Waste Acceptance, Storage, and Transportation budget in FY 2004 request.

# Detailed Program Justification

( Dollars in Thousands )

| | FY 2002 | FY 2003 | FY 2004 |
|---|---|---|---|
| **Phase 1: Yucca Mountain Site Characterization** | **296,886** | **477,922** | **0** |

Phase 1 of the Yucca Mountain Project was completed in FY 2002 when the Department's Acquisition Executive closed the Site Characterization Project and granted permission to start the Repository Design and Licensing Phase.

| | | | |
|---|---|---|---|
| **Phase 2A: Repository Design and Licensing** | **0** | **0** | **419,027** |

The Repository Design and Licensing phase (2A) began in FY 2003 when the Acquisition Executive approved Critical Decision 1, Start of Preliminary Design. Preliminary design requires capital funds.

| | | | |
|---|---|---|---|
| **Regulatory and Licensing** . . . . . (FY 2002/2003: Suitability/Licensing and Performance Assessment) | **66,052** | **146,896** | **118,579** |

In FY 2004, the Office of Civilian Radioactive Waste Management plans to continue those activities essential to support the development of a license application for repository construction for submittal to the Nuclear Regulatory Commission in FY 2005.

To obtain a Nuclear Regulatory Commission construction authorization, the Department of Energy must provide reasonable assurance that a repository loaded with different types of spent fuel and high-level nuclear waste can perform safely while it is being operated and reasonable expectation that there will be no unreasonable risk to public health and safety long after it is closed. The Department will perform a total system performance assessment that analyzes how a repository containing this inventory, with each waste type encapsulated in specially designed waste packages, may perform in the geologic environment of Yucca Mountain following repository closure. This safety analysis will evaluate a nominal case considering those processes and events deemed likely at the Yucca Mountain site. It will also consider the probabilities and potential consequences of disruptive events such as earthquakes and volcanic eruptions, and the possible effects of human intrusion into the repository after permanent closure.

| | | | | |
|---|---|---|---|---|
| **# Site Recommendation** . . . . . | 8,150 | 0 | 0 |

Provide technical support for the submittal of the site recommendation to the Secretary. This includes technical documents that present the essential data analyses and safety arguments that support the site recommendation. This work was completed in FY 2002.

( Dollars in Thousands )

| FY 2002 | FY 2003 | FY 2004 |
|---|---|---|

**# License Application** . . . . . 18,242 91,646 74,400

The Department will continue the work essential to support development of a license application for submittal to the Nuclear Regulatory Commission in FY 2005. The license application will provide the basis for Nuclear Regulatory Commission authorization to construct a repository at the Yucca Mountain site. To authorize construction of a repository, the Nuclear Regulatory Commission must review and consider the license application, and the Department's environmental impact statement to determine that there is reasonable assurance that the types and amounts of radioactive materials can be received and emplaced at the repository without unreasonable risk to the health and safety of the public, and that there is reasonable expectation that the materials can be disposed of without unreasonable risk to the health and safety of the public. The Nuclear Regulatory Commission would consider whether the site and design comply with performance objectives and requirements, and whether other licensing criteria are met.

The license application will be developed to be consistent with the guidance format and content provided by the Nuclear Regulatory Commission's Yucca Mountain Review Plan. The budget to prepare the application has been revised to reflect this guidance. The license application will include a description of site characteristics information, waste package, repository surface and subsurface designs, the basis for development of operations and maintenance plans for surface and subsurface facilities, results of a preclosure safety analysis for the period prior to permanent closure, results of the total system performance assessment for the postclosure period, and a discussion of how the proposed waste package and repository will comply with applicable regulatory requirements. It also will include a discussion of the bases for development of safeguards, certification, and physical security plans and descriptions of the quality assurance program, test and evaluation plan for the development and operation of the repository, and required performance confirmation programs. The license application is expected to be approximately 10,000 pages. The documents referenced by or supporting the license application in addition to other relevant documentary material will be made available to the Nuclear Regulatory Commission in electronic format through a licensing support network. In accordance with the Nuclear Regulatory Commission's regulation, 10 CFR 2, Subpart J, the available relevant material must be loaded into the licensing support network and certified at least six months before the license application is submitted.

The Nuclear Regulatory Commission requires that a fully operational Licensing Support Network (LSN) be in place at least six months prior to DOE's submittal of a license application (LA) in order to support the three-year review time mandated in the Nuclear Waste Policy Act. DOE plans to submit its LA to the Nuclear Regulatory Commission by December 2004 and the LSN must be operational with all data loaded no later than June 2004. To support this schedule, DOE must, in FY 2003, expand the scope

and accelerate the schedule for the preparation and deployment of the LSN. Several LSN-related activities must be expanded and accelerated.

- **General Information Portion of the License Application** . . . . . 0 0 1,500

  Complete development and review of the General Information portion of the license application, including summary descriptions of the physical protection plan and the materials control and accounting plan.

- **Safety Analysis Report Chapters on Repository Safety before Permanent Closure** . . . . . 0 0 5,500

  Complete development and review of the chapters of the Safety Analysis Report that provide information to demonstrate compliance with the Nuclear Regulatory Commission's preclosure performance objectives. These chapters will provide information on site characteristics and design relevant to an evaluation of preclosure safety, and will describe the basis for and results of a preclosure safety analysis.

- **Safety Analysis Report Chapters on Repository Safety after Permanent Closure** . . . . . 0 0 7,000

  Complete development and review of the chapters of the Safety Analysis Report that provide information to demonstrate compliance with the Nuclear Regulatory Commission's postclosure performance objectives. These chapters will provide information on site characteristics and design relevant to an evaluation of postclosure performance, and will describe the basis for and results of a total system performance assessment.

- **Safety Analysis Report Chapters on Research and Development and Performance Confirmation Programs** . . . . . 0 0 2,000

  Complete development and review of the chapters of the Safety Analysis Report that provide descriptions of the research and development program and the performance confirmation program developed to satisfy Nuclear Regulatory Commission licensing requirements.

- **Safety Analysis Report Chapters Satisfying Administrative and Programmatic Requirements** . . . 0 0 2,000

  Complete development and review of the chapters of the Safety Analysis Report that provide descriptions of programs that satisfy Nuclear Regulatory Commission requirements for quality assurance, records management, and personnel training and certification. Also, complete development and review of chapters that provide required information on use of expert elicitation, startup activities and testing, conduct of operations, emergency planning, land use and control, and

identification of license specifications.

- **Programmatic Chapters** . . . . . 1,200 7,500 0

  Develop and review the programmatic chapters of the license application covering radiation protection, conduct of operations, performance confirmation, and land ownership and control. Work to be completed in FY 2003.

- **Site Description and Design Chapters** . . . . . 0 9,000 0

  Develop and review the site description chapter and the design chapters of the license application. Work to be completed in FY 2003.

- **General Information Chapters** . . . . . 1,200 9,300 0

  Develop and review the general information chapters of the license application. Work to be completed in FY 2003.

- **Repository Performance Chapters** . . . . . 842 8,246 0

  Develop and review the preclosure and postclosure performance chapters of the license application. Work to be completed in FY 2003.

- **Regulatory/Oversight Interactions** . . . . . 3,000 3,800 3,600

  Provide interactions with the Nuclear Waste Technical Review Board, the Nuclear Regulatory Commission (staff and the Advisory Committee on Nuclear Waste), and other oversight agencies. Prelicensing interactions with the Nuclear Regulatory Commission have two main objectives: reaching a common understanding of the issues that are significant to overall repository performance, and reaching agreement on the adequacy of methods and approaches to resolve these issues. One purpose of the ongoing interactions is to reach a mutual understanding of the repository concept as it develops. Oversight group interactions, such as those with the Nuclear Waste Technical Review Board, enable a shared understanding of the repository program and receipt of advice and recommendations from external experts and the public. It is anticipated that there will be 25 to 35 interactions per year.

- **Regulatory Reviews** . . . . . 2,200 2,800 2,500

  Provide regulatory reviews and provide regulatory consultation.

- **Licensing and Regulatory Advisory Support** . . . . . 0 5,000 5,000

  Specialized regulatory support is required to assist in formulating licensing strategies, in preparing a high quality LA, and to provide specialized advice during the licensing process.

- **Regulatory Interface Management** . . . . . 0 5,000 5,000

  Development of regulatory response to Nuclear Regulatory Commission questions on technical

issues. Provide necessary expertise to assist the project team to ensure that the scientific work responds to the Nuclear Regulatory Commission requirements, and that Nuclear Regulatory Commission issues are adequately addressed using the appropriate regulatory language.

- **Accelerated Records Management** . . . . . 0 7,000 7,000

  Records management activities includes the acceleration of capturing and processing records into the Records Information System that are required by the LSN. This includes processing backlog documents, re-unitization of 63,000 records previously processed, processing 1,600 boxes of legacy records, improving records quality, completing the missing documentary materials plan, and ensuring document presentation quality. The completion of the above records tasks will be facilitated by the re-engineering of the legacy records system into a national Archives and Records Administration (NARA)-compliant records system.

- **Accelerated Information Management** . . . . . 0 4,000 4,000

  Information technology activities include accelerating the schedule for the design and acquisition of LSN server hardware (including operations support and cyber security resources), and software development of the document identification and content management subsystems. Both the License Application and the electronic docket will require the preparation and management of the supporting computer codes.

- **Accelerated/Expanded Licensing Support Network** . . 0 14,000 14,000

  LSN activities include the identification (screening ) of potential documentary material, satisfying a new requirement to review documents for potentially sensitive information (homeland security), and the public release review to prevent the release of any classified material.

- **Licensing Support Network** . . . . . 3,000 6,100 6,000

  Review project records and technical documents for inclusion into the licensing support network. Maintain the licensing support network operation and support initial certification of the department's portion of the licensing support network at least six months prior to submittal of the license application. In FY 2004, complete development and make available to the NRC and other potential parties to licensing an electronic information system consistent with the requirements of 10 CFR Part 2, Subpart J. Certification requirements include procedures and documentary material required by Section 2.1003 of 10 CFR Part 2, Subpart J have been identified and made electronically available. Update the certification upon submittal of the license application. This budget category requires capital funds for FY 2003 and FY 2004.

- **Verify Data** . . . . . 3,800 7,100 6,500

  Verify the data used in the license application to ensure it is traceable and referenceable and that records processes are adequately maintained to accurately capture images and text.

( Dollars in Thousands )

| | FY 2002 | FY 2003 | FY 2004 |
|---|---|---|---|
| • **Radiation Protection, Emergency Plan** . . . . . | 3,000 | 2,800 | 2,800 |
| Prepare the radiation protection program, emergency plan, and land use plans to support the regulatory documents. | | | |
| # **Technical Information Management (computer equipment for LSN)** . . . . . | 26,020 | 31,300 | 30,900 |
| Manage and ensure the integrity and traceability of the technical data and program records that have been compiled to support license application and associated design and analysis activities for Yucca Mountain. | | | |
| • **Load Internet/Licensing Support Network** . . . . . | 4,010 | 4,100 | 4,000 |
| Develop, update, and maintain key technical products, procedures, and program deliverables, including the licensing support network, regarding the license application. | | | |
| • **Comments and Commitments** . . . . . | 2,500 | 2,550 | 2,500 |
| Develop, populate, and maintain the data bases which track comments and commitments to regulators and oversight groups in support of the license application. | | | |
| • **Computer Applications** . . . . . | 6,975 | 12,000 | 12,000 |
| Develop and maintain information systems, computer applications, databases, operating systems, utilities, networks, and software development to ensure integrity of data and systems. | | | |
| • **Capture Documents for Internet/Licensing Support Network** . . . . . | 6,290 | 6,350 | 6,200 |
| Place key technical products on the Internet to provide public access to program information and on the LSN to support licensing. | | | |
| • **Maintain Technical Data Bases** . . . . . | 6,245 | 6,300 | 6,200 |
| Populate, and maintain the technical data bases which contain field data, results of laboratory tests, engineering analyses, location information, radioactive waste inventories, waste forms characteristics, and data sets generated and used by the Department as input to design, performance assessment, and development of the license application. | | | |
| # **Performance Assessment** . . . . . | 13,640 | 23,950 | 13,279 |
| Performance assessment is a mathematical modeling method for forecasting how the repository system (both engineered and natural barriers) contains and isolates radioactive waste over time. A total system | | | |

performance assessment is an analysis in which the postclosure behavior of the principal systems and components of a Yucca Mountain repository system are modeled into a single analysis. An iteration in FY 2002 of the total system performance assessment was completed to support the site recommendation; another iteration of the total system performance assessment will be completed in FY 2004 to support the license application and

will reflect increased understanding of how emplaced nuclear waste would interact with the natural and engineered barriers.

Updated data from scientific tests and designs, along with review comments from various sources, will be incorporated into the abstracted models that support the total system performance assessment for the license application. The abstracted models include biosphere, disruptive events, engineered barrier system degradation, waste form degradation, integrated site, near-field environment, waste package degradation, saturated-zone flow and transport, and unsaturated-zone flow and transport models. Abstracted models reproduce or bound the essential elements of more detailed process models and capture the uncertainty and variability in what is often but not always, a simplified or idealized form.

The total system performance assessment supporting the license application will be completed in mid FY 2004. Additional total system performance assessment analyses, including sensitivity analyses where some abstraction models are modified will be conducted to support th licensing process.

| | | | |
|---|---|---|---|
| • **Total System Performance Assessment** . . . . . | 1,520 | 5,200 | 4,000 |
| Conduct the postclosure safety analyses to support the license application using the total system performance assessment method. | | | |
| • **Control of Software and Data** . . . . . | 3,500 | 3,900 | 3,400 |
| Perform process control of software and data. | | | |
| • **Disruptive Events Model** . . . . . | 400 | 1,050 | 400 |
| Develop, abstract, and test the disruptive events models. | | | |
| • **Saturated-Zone & Biosphere Model** . . . . . | 1,400 | 2,000 | 800 |
| Develop, abstract, and test the saturated-zone and biosphere models. | | | |
| • **Waste Form and Engineered Barrier** . . . . . | 570 | 1,800 | 800 |
| Develop, abstract, and test the waste form and engineered barrier system transport models. | | | |
| • **Waste Package** . . . . . | 500 | 1,400 | 700 |

( Dollars in Thousands )

| | FY 2002 | FY 2003 | FY 2004 |
|---|---|---|---|
| Develop, abstract, and test the waste package degradation models. | | | |
| • **Unsaturated-Zone Flow** . . . . . | 2,100 | 3,500 | 1,200 |
| Develop, abstract, and test the unsaturated-zone flow and transport models. | | | |
| • **Total System Performance Assessment Approach** . . . | 1,370 | 3,000 | 1,000 |
| Develop a total system performance assessment approach and model development. | | | |
| • **Design and Regulatory Analysis to Support the SR and License Application** . . . . . | 2,280 | 2,100 | 979 |
| Conduct design and regulatory analysis to support the development of the license application. | | | |
| **Cost Reductions and Systems Enhancements** . . . . . | **0** | **2,000** | **25,000** |

OCRWM is committed to continuing scientific investigations to improve understanding in the geologic repository system, to increase confidence in the technical basis for the disposal of HLW and SNF, and to do so in a cost and schedule-effective way. To meet these objectives, a science and technology program will be established and implemented that will focus on areas of potential technical or programmatic risk to the waste management system. The program will sponsor activities to minimize these risks by improving the current waste disposal system through the application of science and technology. To meet these objectives, activities will be chosen that are: 1) technically and programmatically feasible; 2) will increase confidence in the technical basis for long-term performance of a repository, including performance projections to the time of peak dose; and 3) promote cost efficiencies in the waste management system through long-term testing and analysis and the application of new innovative technologies. These efforts will increase confidence in the technical basis for long-term performance of the geologic repository and the waste management system.

| | | | | |
|---|---|---|---|---|
| # | **Performance Improvement and Confidence Building** . . . . | 0 | 1,000 | 12,500 |

Identify, evaluate, and support scientific investigations and analyses of current and developing technologies that will lead to increased confidence in the understanding of the physical processes at Yucca Mountain and enhance the defense of long term projections of site performance. Long term performance will be evaluated out to peak dose. For example, information from the study of natural analogues can be used to increase the confidence of diverse audiences and interested parties in the natural and engineered systems and provide a better basis for their understanding of the complex system. Recommendations of over sight groups and peer constituencies will be carefully considered for incorporation into this part of the program. Although these activities are primarily designed to build confidence in understanding the geologic disposal system, they may also support the licensing process during the Nuclear Regulatory Commission's review of the license application, the hearings, and

subsequent license updates. These activities will promote technical collaboration with oversight groups, international repository programs, universities, and other scientific organizations, and will leverage applicable technologies from other offices within the Department of Energy.

Based on evaluations of the contributions of natural and engineered barriers to waste isolation, activities will be supported that reduce risk by increasing our understanding and confidence in the role of these barriers. Activities related to parts of the natural system, such as the saturated and unsaturated zones and the environment around the drifts, will be considered for their potential to increase our understanding of natural barrier performance. Parts of the engineered system, including the waste package will also be considered for activities that will improve performance and reduce costs. The goal of these activities is to manage risk by determining the relative value of the activities and their contribution to waste containment and supporting those activities that are expected to reduce risk.

**# Cost Reduction and System Enhancements** . . . . . 0 1,000 12,500

Identify potential activities that may contribute to efficiencies in the entire waste management system by improving existing technologies, developing innovative new technologies, testing and evaluating the applicability of these new technologies, in order to achieve efficiencies and to reduce the life-cycle costs of the waste management system. Explore the issues of radioactive waste toxicity and waste volume reduction. System-level evaluation approaches will be used to identify candidate systems and materials that will be evaluated. Emerging technologies will be identified, evaluated and implemented if cost benefits warrant. These activities are designed for long-term cost reduction and system improvements.

Alternative engineered materials, alternative waste forms, evaluation of the low-temperature operating mode, and alternative waste package fabrication methods are areas open for consideration to improve system efficiencies and potentially reduce costs. Candidate activities and alternatives will be identified and considered through the use of scenario development/strategy evaluation formalized modeling techniques.

**Testing and Performance Analysis** . . . . . **71,373 71,320 55,540**
(FY 2002/2003: Core Science)

This budget element encompasses surface and subsurface field tests and monitoring, laboratory tests, natural analog investigations, literature reviews, and analyses and modeling of resulting data.
Some studies will be conducted under a cooperative agreement with the University and Community College System of Nevada.

This budget element includes those items needed to support completion of the license application. These activities began during the site characterization phase and supported completion of the site recommendation.

( Dollars in Thousands )

| FY 2002 | FY 2003 | FY 2004 |
|---|---|---|

Activities conducted during the repository design and licensing phase will validate assumption and models used in the license application, further reduce uncertainties, and close NRC issues. Some activities will continue beyond submittal of the license application to continually improve understanding of repository performance.

**# Data Analysis and Modeling** . . . . . 27,690 27,900 26,000

This work area involves the analysis and modeling of data collected from scientific testing to help confirm understanding of the natural features and processes of the site.

Evaluate newly acquired test data and analyses relative to models of the site's natural features and processes to confirm the bases for or to update the models which the performance assessment for the license application is based. The natural system process models to be evaluated include: integrated site, unsaturated-zone flow and transport, saturated-zone flow, transport and coupled processes, disruptive events, and biosphere models. The flow and transport models are supported by several lower-level ground water flow and transport models which will also be evaluated.

- **Saturated-Zone for Total System** . . . . . 2,000 2,500 2,000

  Evaluate latest test data and analyses relative to modeling of the saturated-zone for total system performance assessment for the license application including data collected from the alluvial tracer complex, for tests started in FY 2001.

- **Saturated-Zone Process Model Report** . . . . . 3,200 3,100 2,500

  Evaluate latest test data and analysis relative to modeling of the saturated-zone for process models and license application technical updates.

- **Unsaturated-Zone Flow, Transport, and Coupled Processes Model Report** . . . . . 4,500 4,400 3,500

  Evaluate the latest test data and analysis relative to modeling of the unsaturated-zone and near-field environment for process models and license application technical updates. Evaluate data from the thermal tests, including those from the cross drift started in FY 2003, relative to data analysis and modeling for the coupled process model and technical update for license application.

- **Unsaturated-Zone Flow, Transport, and Coupled Processes Model for Total System Performance Assessment** . . . . . 4,700 4,600 4,000

  Evaluate the latest test data and analysis relative to the modeling of the unsaturated-zone and near-field environment for the total system performance assessment that supports the license application. Evaluate data from the thermal tests, including those from the cross drift started in FY 2003, relative

to data analysis and modeling for the coupled process model and technical update for license application.

- **Near Field PMR** ..... 1,000 0 0

  Incorporated data from the thermal tests, including those from the cross drift into analysis and modeling for the coupled process and technical update for license application. Work was completed in FY 2002.

- **Integrated Site Model and Disruptive Events** ..... 1,090 1,200 1,200

  Evaluate latest test data and analysis relative to integrated site model and disruptive events models for license application.

- **Biosphere Process Model Report** ..... 2,200 2,100 2,000

  Evaluate latest test data and analysis relative to modeling for biosphere for license application.

- **Nevada University System** ..... 3,200 3,600 5,000

  Support Nevada University System scientific studies which provide independent studies and analysis of Yucca Mountain. Work includes over 30 studies covering radionuclide and colloids transport in the saturated-zone, rock physical studies, and investigations of ground surface strains. Work also includes production of tracers for use in water flow tests and analysis of water samples.

- **Natural Anologs and Site Description** ..... 2,200 3,000 2,800

  Conduct data interpretations and modeling for natural analogs and the site description to confirm the bases for and support updates of the license application.

- **Technical Support** ..... 3,600 3,400 3,000

  Provide technical support activities for license application document preparation.

**# Testing to Support License Application** ..... 19,500 19,385 4,000

Numerous tests will support development of the documentation needed to prepare the license application. The tests include the on going long-term seepage and fracture-matrix interaction tests and the drift-scale thermal test in the exploratory studies facility; the hydrologic tests begun in FY 2000 and FY 2001 in the cross drift for enhanced characterization of the repository block, specifically the lower lithophysal unit, the thermal tests in the cross drift that were originally planned to begin in FY 2001; conclusion of the Atomic Energy Commission of Canada tests on radionuclides transport in the non-welded tuff; monitoring the Nye County Early-Warning Drilling Project wells; and continuing the alluvial tracer complex tests in the saturated zone started in FY 2001.

( Dollars in Thousands )

| FY 2002 | FY 2003 | FY 2004 |
|---|---|---|

Testing to support the license application continues to reduce the uncertainty in the technical databases, the total system performance assessment, and design features. The testing activities are focused on addressing the issues raised by the Nuclear Waste Technical Review Board and those required to close the remaining key technical issues with the Nuclear Regulatory Commission.

- **Water Release Seepage Experiments** . . . . . 600 800 500

  Conduct water-release seepage experiments in the repository horizon. This includes collection and analysis of pneumatic testing, water recovery data, and determination of drift seepage threshold in the unit.

- **Moisture Monitoring and Seepage** . . . . . 2,500 3,000 2,000

  Conduct moisture monitoring and seepage observations in the cross-drift beneath suspected zone of high infiltration.

- **Pneumatic** . . . . . 2,500 2,500 1,500

  Conduct pneumatic, hydrochemical, and hydraulic testing of the Solitario Canyon Fault to obtain hydro geologic parameters.

- **Site Investigations Base Support** . . . . . 2,200 2,200 0

  Site investigations base support and test coordination/support for site activities.

- **Exploratory Studies Facility (ESF) Testing** . . . . . 3,000 3,000 0

  Continue the drift scale thermal testing (hydrology and hydrology chemistry tests) in the ESF. The four-year cooling phase begins in FY 2002.

- **Cross Drift Testing** . . . . . 2,900 3,000 0

  Conduct ambient test (fracture matrix interaction and seepage) and thermal tests (hydrologic, chemical, and mechanical) in the cross drift.

- **Support Nye County** . . . . . 3,000 2,085 0

  Support Nye County Early-Warning System Drilling Project.

- **Atomic Energy Commission of Canada and US Bureau of Reclamation** . . . . . 200 200 0

  Consult with the Atomic Energy Commission of Canada and fund interagency support from the U.S. Bureau of Reclamation Services.

- **Alluvial Tracer Complex** . . . . . 2,600 2,600 0

  Support testing of the saturated-zone at the alluvial tracer complex.

( Dollars in Thousands )

| FY 2002 | FY 2003 | FY 2004 |
|---|---|---|

**# Testing for the License Application and Performance Confirmation** ..... 10,860 10,216 11,800

The database built during site characterization and throughout repository licensing, construction, and operation will be used to continually improve understanding of repository performance and to validate assumptions in the license application that are the basis for Nuclear Regulatory Commission findings about repository system performance. Some testing started during site characterization will continue until repository closure as part of the performance confirmation program. Tasks include the following:

- **Long-Term ESF Testing** ..... 2,560 2,500 2,000

  Perform long-term seepage tests in the exploratory studies facility and the cross drift that were started during site characterization. The performance confirmation tests overlap between site characterization and follow-on phases of the Program.

- **Site Investigations Base Support** ..... 1,500 1,500 1,500

  Provide site investigations base support and test coordination/support for site activities.

- **ESF Testing** ..... 2,000 2,000 2,000

  Continue hydrology and drift scale thermal testing (hydrology and hydrology chemistry migration tests) in the exploratory studies facility.

- **Cross Drift Testing** ..... 2,150 2,500 2,500

  Perform ambient, fracture matrix interaction and seepage, and thermal tests (hydrology and hydrology chemistry tests) in the cross drift.

- **Support Nye County** ..... 250 150 2,000

  Support Nye County Early-Warning System Drilling Project.

- **Atomic Energy Commission of Canada and U.S. Bureau of Reclamation** ..... 900 566 600

  Consult with the Atomic Energy Commission of Canada and fund the interagency support from US Bureau of Reclamation Services.

- **Alluvial Tracer Complex** ..... 500 500 500

  Support testing of the saturated-zone at the alluvial tracer complex.

- **Inyo County** ..... 1,000 500 700

  Support hydrologic investigations needed to better define the relationship of the saturated-zone site-scale flow model with the groundwater flow system.

( Dollars in Thousands )

| FY 2002 | FY 2003 | FY 2004 |
|---|---|---|

**# Environmental Safety and Health Monitoring and Compliance** ..... 13,323 13,819 13,740

Environmental monitoring and compliance began with site characterization and will continue throughout licensing, construction, operations, closure, and decommissioning of the repository.

- **Maintain Permits** ..... 6,383 6,579 6,500

  Maintain compliance with environmental permits and environmental regulatory requirements.

- **Technical Support** ..... 2,800 3,100 3,100

  Support to executive orders related to "Greening of the Government". Provide meteorological/radiological integration and regulatory support. Environmental support to construction and design.

- **Safety and Health Compliance** ..... 4,140 4,140 4,140

  Maintain safety and health compliance.

**Design and Engineering** ..... **71,710 128,465 114,217**

In FY 2003, DOE began development of a preliminary design for a monitored geologic repository at Yucca Mountain that would house spent nuclear fuel from commercial nuclear power plants, DOE-managed SNF and SNF , naval spent nuclear fuel, and immobilized plutonium. These waste forms have diverse characteristics with respect to radioactive materials, size, weight, configuration, heat output and levels of radioactivity. DOE SNF presents particular complexity because there are over 250 kinds. The DOE will perform a preclosure safety analysis of the performance of the repository and its operating systems prior to closure. The postclosure safety analysis is budgeted under the Regulatory and Licensing budget element.

Occupying about 100 acres, repository surface facilities would receive waste and prepare it for disposal. They would also support the excavation, construction, loading, and ventilation of repository tunnels.

Preliminary Design

Preliminary design is the information required to develop a docketable license application for construction authorization. Information not directly required to support that application would be minimally developed, particularly so in the non-nuclear balance of plant facilities. The result of this would be shifting that design work later in time, requiring a greater level of design activities in the 2006-2010 period and putting waste acceptance in 2010 at risk.

The surface facilities are being designed around a set of core functions. Shipping casks containing spent

nuclear fuel and high-level waste would be received from rail or truck carriers at the Disposal Container Preparation Building where they would be prepared for waste removal. Waste would then be removed from the shipping casks and loaded into waste packages at the Waste Handling Facilities, where waste packages would be welded shut. Low-level waste generated during waste handling operations would be prepared for off-site disposal. Vehicles used to transport sealed waste packages to a holding area and then to emplacement drifts would be serviced at the Transporter Maintenance Building.

Major surface facilities would also include a waste treatment building, site utilities, and other support facilities, such as warehouses, maintenance shops, and administrative facilities.

The major features of the subsurface repository layout are a series of main drifts with exhaust mains, long, parallel emplacement drifts, ventilation shafts, and access ramps. Rail systems will transport workers, construction material, and the waste packages.

The design of the subsurface facilities includes the man-made system (engineered barrier system) intended to confine and contain the highly radioactive materials (waste forms). The components of the engineered barrier system are being designed to prevent water from contacting the waste forms inside the waste packages for thousands of years.

The engineered barrier system has three major components. The first is the disposal container (waste package) holding the waste form. The second major component is the support structures that keep the waste packages from resting on the floor of the emplacement drifts. The last element includes additional features that may be added to the engineered barrier system to improve its ability to confine and isolate the nuclear waste.

Waste packages would have a dual-metal design containing two concentric cylinders. The basic waste package preliminary design is the same for all the waste forms. However, the sizes and internal configurations vary to accommodate the different waste forms.

Development of the preliminary design includes the following elements:

- Preliminary layout drawings of major components
- Accident analysis
- Configuration management plan
- Component requirements identified
- Drawings, including general arrangement drawings, piping and instrumentation diagrams, mechanical flow diagrams, electrical and equipment drawings
- Material balance throughput analyses
- System design descriptions at the system level, and system boundaries identified

- Information exchange diagrams
- Updated risk management plan
- Value engineering

License Application Design

During the Preliminary Design phase which began in FY 2003 and continues into FY 2005, the DOE will develop a license application for construction authorization, which must demonstrate that a repository for spent nuclear fuel and high-level radioactive waste can perform safely during waste emplacement and for many thousands of years in the future. The license application design is a subset of preliminary design.

The design and engineering products needed to support the license application include the development of the preclosure safety analysis; design studies to support the development of the postclosure safety analyses; design bases (which includes the design requirements and evidence to satisfy these requirements); and a description of the waste package, waste forms, and surface and underground facilities and systems. The design products for license application will be completed in FY 2004, the remainder of preliminary design will be completed in FY 2005.

The license application design products will include information based on the safety significance of the system. Those items that are important to safety will be have more detailed design, such as Surface and Underground waste handling systems. Items that are not important to safety, such as administration buildings and water services, will have less detailed descriptions.

License application design products include the following information, based on the safety significance of the system:

- Applicable codes and standards
- Design criteria and regulatory design bases
- General system description
- Piping and instrumentation diagrams
- Electrical one-line diagrams
- General arrangement drawings
- Handling diagrams
- Information on dimensions, material properties, specification, and analytical and design methods used in the design.

The preliminary design capital asset includes preliminary design started in FY 2003 and extending through FY 2005. The FY 2003 budget request included an initial Project Data Sheet that included an estimate for the work.

More fully developed designs of the waste package, surface, and subsurface facilities to reduce licensing risks and to perform more non-nuclear balance of plant design to improve the likelihood of waste acceptance and emplacement of nuclear waste in FY 2010 starts in FY 2004. This will allow more complete design to support the regulatory case and greater level of development for the non-nuclear facilities.

In order to meet the construction schedule for waste acceptance and emplacement for FY 2010, design must continue to be developed for major nuclear facilities and systems, including the waste handling building, nuclear fuel transfer systems, waste package transportation on the surface and into the underground repository, underground tunnels, and waste package emplacement systems. The work that also must continue to be developed includes the control systems for the entire nuclear operating systems, and the robotics needed for a nuclear environment. Construction specifications must be developed for major systems in the surface and subsurface facilities, and for the waste package which will be needed for waste emplacement.

Detail design that needs to start in FY 2004 includes: (a) Development of final (working) drawings and specifications for procurement and construction; (b) development of construction, labor, equipment, and material quantities; (c) Development of detailed estimates of the cost of construction, procurement, and construction schedules, methods of performance, and identification of work packages; (d) Preparation of analyses of health, safety, environmental, and other project requirements; and (e) Identification of test plans, preparation of procurement plans, and determination of utility service requirements.

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| # | **Waste Package Design** | 9,200 | 15,200 | 17,750 |

The diverse inventory of waste forms to be disposed of in the geologic repository will require the development of several different types of waste packages. The waste packages must be robust so they can be handled safely and they must be corrosion and heat resistant. The waste package must also provide safety with regard to criticality (a self-sustaining chain reaction) during both the pre- and postclosure periods. During the postclosure period the waste package must contain radionuclides for many thousands of years.

| | | | | |
|---|---|---|---|---|
| • | **Waste Package Design** | 4,200 | 7,800 | 7,000 |

The diverse inventory of waste forms to be disposed of in the geologic repository will require the development of several different types of waste packages. The waste packages must be robust so they can be handled safely and they must be corrosion and heat resistant. The waste package must also provide safety with regard to criticality (a self-sustaining nuclear chain reaction) during both the pre- and postclosure periods. During the postclosure period, the waste package must contain radionuclides for many thousands of years.

| | | | | |
|---|---|---|---|---|
| • | **Closure Welds** | 2,100 | 3,600 | 3,500 |

Develop fabrication, welding, and testing methods and identify standards, technologies, and procedures needed to fabricate waste packages and perform and inspect the closure weld.

- **Design Options** ..... 900 1,200 0

  Perform waste package designs, options, and analysis for site recommendation and license application. Work to be completed in FY 2003.

- **Criticality Analysis** ..... 1,000 2,300 2,000

  Conduct disposal criticality analysis, which will develop methodologies for evaluating the potential for criticalities and attendant consequences for plausible waste form configurations. Validation of codes used in the methodology.

- **Neutronics Methodology** ..... 1,000 300 250

  Provide neutronics methodology development.

- **Waste Package Engineered Barrier System Detailed Design** ..... 0 0 2,000

  Detailed design of the drip shields, waste package pallets and support, waste package detailed design, and process equipment fabrication, and development of waste package requirements of the engineering barrier system.

- **Waste Package Engineered Barrier System**..... 0 0 3,000

  Procurement for process equipment fabrication, pallets, and supports fabrication, and waste package fabrications of the engineered barrier system.

**# Subsurface Facilities Design**..... 10,260 26,030 25,900

Subsurface engineering provides the design, description, integration, and decommissioning of the underground features of the repository. Design requirements to be met include those for waste emplacement, containment and isolation, compliance with thermal loading requirements, stability of excavations, a safe working environment, and waste package retrieval.

- **Facilities and Utilities** ..... 1,270 5,030 4,000

  Design and analysis of the subsurface facilities and safety systems, including radiological safety, radiation shielding, electrical distribution, fire protection, instrumentation and controls, remote systems, and performance confirmation design.

- **Waste Emplacement & Retrieval** ..... 610 5,100 4,000

  Design and analysis of the waste emplacement and retrieval system, including waste package underground transport and underground waste package retrieval (transporter and locomotives), and emplacement (gantry and gantry transporter).

( Dollars in Thousands )

| | FY 2002 | FY 2003 | FY 2004 |
|---|---|---|---|
| • **Engineered Barrier System Design** | 6,200 | 7,300 | 6,000 |
| Design and analysis of the engineered barrier system, including drip shield support, emplacement drift inverts, sealing and closure systems, and repository layout and design confirmation. | | | |
| • **Ground Support Design** | 380 | 4,300 | 4,000 |
| Design, testing and analysis of the ground control system, emplacement and non-emplacement drift ground support design, and shaft and ramp design. | | | |
| • **Ventilation System Design** | 1,800 | 4,300 | 4,000 |
| Design and analysis of the ventilation systems, including the separate waste emplacement and underground development area ventilation systems. | | | |
| • **Emplacement/Retrieval System** | 0 | 0 | 900 |
| Detailed design, including development of the following drawings and technical documents: civil, structural, architectural, electrical, mechanical, mechanical handling, geotechnical, instrumentation and control, and plant design for the emplacement/retrieval system. | | | |
| • **Panel #1 Utilities** | 0 | 0 | 1,000 |
| Detailed design, including development of the following drawings and technical documents: civil, structural, architectural, electrical, mechanical, mechanical handling, geotechnical, instrumentation and control, and plant design for the Panel #1 systems and utilities. | | | |
| • **Panel #1 Tunnel and Ground Support** | 0 | 0 | 2,000 |
| Detailed design, including development of the following drawings and technical documents: civil, structural, architectural, electrical, mechanical, mechanical handling, geotechnical, instrumentation and control, and plant design for the Panel #1 tunnel and ground support. | | | |
| # **Surface Facilities Design** | 6,900 | 32,800 | 34,400 |
| The design includes design of the buildings, operations, systems located in the radiological controlled area, those buildings, systems, and operations outside the radiologically controlled area, transportation, and all on-site and off-site utilities. | | | |
| • **Waste Handling Building General Arrangement** | 2,115 | 5,200 | 4,000 |
| Design for the waste handling building general arrangement drawings and equipment layout, which will provide drawings of the waste handling building showing the building layouts of major structural features and equipment. The drawings will include overall dimensions of the facility, with building cross-sections and elevations. | | | |
| • **Waste Handling Building Design** | 2,060 | 11,800 | 9,000 |

( Dollars in Thousands )

| FY 2002 | FY 2003 | FY 2004 |
|---|---|---|

Design for the waste handling building; includes receipt of waste (transportation casks), fuel blending for manageable heat content, waste package welding, and related operations.

- **Radiologically Controlled Area Design** ..... 1,340 6,400 5,000

  Design for the radiological controlled area buildings, operations, and systems necessary for waste handling system, waste treatment, carrier preparation, and transporter maintenance.

- **Balance of Plant** ..... 1,310 4,900 4,000

  Design for outside the radiological controlled area buildings, operations and systems that make up the balance of plant including: administration, fire control, emergency response, medical, radiological monitoring, communications, security, transportation, and safeguards and security.

- **Site Utilities Design** ..... 75 3,600 3,000

  Design for the site utilities, including electrical, environmental monitoring, fuel oil and gasoline storage, sanitation, storm control and drainage, and water supply.

- **Off-Site Power and Communication Design** ..... 0 900 900

  Design for the off-site power and communications, develop designs, analysis, and specifications sufficient for request-for-proposals for procurement.

- **Surface Facility Support Systems** ..... 0 0 3,000

  Detailed design, including development of the following documents: civil, structural, architectural, electrical, mechanical, mechanical handling, geotechnical, instrumentation and control, and plant design for the surface facility support systems.

- **Disposal Container Preparation Building Detailed Design** ..... 0 0 1,500

  Detailed design, including development of the following drawings and technical documents: civil, structural, architectural, electrical, mechanical, mechanical handling, geotechnical, instrumentation and control, and plant design for the disposal container preparation building.

- **Transporter Receipt Building Detailed Design** ..... 0 0 1,000

  Detailed design, including development of the following drawings and technical documents: civil, structural, architectural, electrical, mechanical, mechanical handling, geotechnical, instrumentation and control, and plant design for the transporter receipt building.

- **Dry Facility #1 Detailed Design** ..... 0 0 2,000

  Detailed design, including development of the following drawings and technical documents: civil, structural, architectural, electrical, mechanical, mechanical handling, geotechnical, instrumentation and control, and plant design for the Dry Facility #1.

( Dollars in Thousands )

| | FY 2002 | FY 2003 | FY 2004 |
|---|---|---|---|
| • **Offsite Utilities Detail Design** | 0 | 0 | 1,000 |

Detailed design, including development of the following drawings and technical documents: civil, structural, architectural, electrical, mechanical, mechanical handling, geotechnical, instrumentation and control, and plant design for the roads and structures, water, power, and communications.

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| # | **Systems Engineering** | 12,430 | 16,335 | 14,376 |

The systems engineering process is important to coordinate and integrate design functions to ensure that designs meet regulatory and safety requirements for protecting workers, the public, and the environment; systems engineering conducts analysis to demonstrate that preliminary designs will operate cost-effectively and efficiently; and to ensure that changes to requirements, designs, and specifications are documented and controlled in accordance with quality assurance requirements.

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| • **Design Integration** | 7,050 | 7,100 | 6,126 |

Conduct design and engineering integration–update and maintain the interface control and System Design Documents (SDDs) that define the requirements and physical interfaces among structures, systems and components of the waste management system and provide integration among the design elements.

| | | | |
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| • **Alternatives/Options Evaluations** | 290 | 500 | 200 |

Provide alternatives/options evaluation–conduct an integrated review of design options.

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| • **Interface Configuration Management** | 670 | 1,400 | 500 |

Provide an interface configuration management for license application data and design; provide support for license application verification.

| | | | |
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| • **Configuration Management System** | 0 | 1,500 | 1,500 |

Maintain a configuration management system for the preliminary design and supporting documentation. Maintain control over changes in the design and scientific analysis, identification of the configuration items, and provide traceability and accountability for changes as the detailed preliminary design evolves. Conduct a comprehensive review of several hundred design products (drawings, requirement documents, and analyses) to verify that the design meet the regulatory and design requirements.

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| • **Procurement Construction-Test Development** | 0 | 0 | 700 |

Develop test plans for early construction and development testing.

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|---|---|---|---|
| • **Cost Estimating** | 120 | 1,200 | 1,300 |

Maintain and update the repository total project cost estimate and the total system life cycle cost estimate.

( Dollars in Thousands )

| | FY 2002 | FY 2003 | FY 2004 |
|---|---|---|---|
| • **Preclosure Safety Analysis** ..... | 1,200 | 2,385 | 2,300 |
| Complete integrated preclosure safety analyses of the repository and preliminary design and operations. Maintain the Q-list, classification analysis, hazards analysis, design basis event sequences, and consequences analyses. | | | |
| • **Mined Geologic Repository Requirements** ..... | 2,750 | 1,500 | 1,200 |
| Maintain traceability of regulatory and design requirements. Ensure that the design basis developed for the License Application Safety Analyses Report (SAR) are controlled and the compliance is documented. This requires the maintenance of all project requirement documents, including the Project Criteria Document (PCD) and System Description Documents (SDDs). | | | |
| • **Performance Confirmation Test Plans** ..... | 350 | 750 | 550 |
| Maintain and update the performance confirmation and test and evaluation plans. | | | |
| ( The design and engineering that is not capitalized is described below. ) | | | |
| # **Waste Forms and Waste Package Materials** ..... | 29,820 | 32,800 | 18,791 |
| Testing of waste forms and candidate materials for waste package fabrication, under anticipated repository conditions, provides the basis for developing performance models that predict the natural degradation of the waste, changes to the cladding over time, and the containment of the waste within the waste packages. These tests in turn support selection of materials for fabrication of waste packages that would isolate radionuclides for thousands of years. | | | |
| • **Long-Term Waste Form Testing** ..... | 6,290 | 6,500 | 6,000 |
| Perform long-term waste form testing and modeling including testing of waste forms under various chemical and moisture conditions, oxidation tests using thermogravimetric analysis, flow through dissolution tests, tests on cladding and hardware, and tests on borosilicate glass. | | | |
| • **Waste Package Materials Testing** ..... | 12,150 | 11,500 | 7,000 |
| Conduct waste package materials testing to predict materials performance under repository relevant conditions including long-term corrosion, microbial induced corrosion, passivity and localized corrosion, passive film and oxide growth, thermal aging and phase stability, stress corrosion cracking and hydrogen-induced cracking, and experimental determination of waste package surface environment. | | | |
| • **Waste Package and Waste Package Testing** ..... | 8,380 | 8,400 | 5,791 |
| Conduct waste package degradation and waste form degradation testing, analysis and process modeling, and integration of near-field environment thermal, mechanical, and hydrologic processes. | | | |

( Dollars in Thousands )

| | FY 2002 | FY 2003 | FY 2004 |
|---|---|---|---|
| • **Nevada University System** ..... | 3,000 | 6,400 | 0 |

Support Nevada University System independent studies and analysis of Yucca Mountain work includes over 10 engineering and waste package materials studies including stress corrosion cracking/electrochenical testing and model support and thermal transport evaluations related to waste package design. This category is transferred to the Testing and Performance Analysis budget element in FY 2004.

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| # **Engineered Barrier System Testing** ..... | 3,100 | 5,300 | 3,000 |

Testing and analysis of the engineered barrier system, including testing and analysis of design features and concepts and design basis for modeling and analysis.

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|---|---|---|---|
| **Nevada Transportation Design** ..... | **0** | **13,000** | **0** |

Initiate design for a Nevada transportation system, develop requirements and provide technical support for conceptual design of the Nevada transportation system. DOE would select a contractor to develop the NEPA documentation necessary for developing a branch rail line in Nevada. In FY 2003 the NEPA contractor would prepare a project management plan, project plan, project schedule, and draft annotated outline for the necessary documentation. Prepare documents and plans required under DOE Order 413.3 as part of the Critical Decision 1 submittal, required as a result of designation of Transportation as a separate project requires the development of a suite of documents that consist of plans, strategies, etc. as part of the Critical Decision 1 submittal. The documents are essential for project planning, and allow for earlier approval of the Nevada rail project. Develop Nevada rail performance requirements necessary to development of design requirements, development of the rail system specification and initiation of conceptual design. Include potentially unique requirements from considerations of Homeland Security and specific issues associated with a rail line in the State of Nevada. Improve information and refine processes to facilitate earlier selection of a rail corridor. Prepare detailed rail corridor fact books based on information derived from other tasks. Prepare audiovisual aids to facilitate interactions with key stakeholders and the public in identifying and selecting a preferred rail corridor from the five rail corridors under consideration. Begin development of conceptual design of bridges, tunnels, large drainage structures, maintenance facilities, sidings, and rail yards for all five corridors, for better understanding of cost/schedule./land impacts. Earlier completion allows early start of preliminary design to ensure completion of Nevada rail by 2010. Conduct bench-marking and optimization studies of operating rail companies currently transporting SNF and/or HLW to incorporate lessons learned into the design and operation of a Nevada rail line. Factors to be studied include cask cycle time and rail maintenance needs. Insights gained would support acquisition planning, the NEPA process, and preliminary design. Early start of this land acquisition strategy and plan development, which is a risk activity through early development of required information and of the plans and processes needed to acquire land for

Nevada rail. Acceleration of the development and implementation of the land acquisition strategy and research on land use within the potential rail corridors would alleviate some of the uncertainty associated with the land acquisition process. This research would include identification of existing mining claims, land uses, and grazing leases. Early preparation of a land reservation right-of-way or withdrawal application and assistance funding to the Bureau of Land Management support overall land acquisition process timing and ensure proper coordination with the Nevada rail effort. Protection of health, safety, and the environment - on-going, expanded, independent YMP program oversight and monitoring plus local monitoring of radiological exposure and health; full local capability for radiological emergency response and medical services; and centers for radiological waste management research and development and for training in nuclear waste transport. Protections in transportation mode and route selection - consultation in selecting transportation routes and modes, an integrated plan for the two national shipping campaigns (low-level and high-level waste); and rail transport of highly radioactive wastes in the situs county. This budget element will transfer from Yucca Mountain budget to the Waste Acceptance, Storage, and Transportation budget under OCRWM in FY 2004.

| | FY 2002 | FY 2003 | FY 2004 |
|---|---|---|---|
| **National Environmental Policy Act** | **1,600** | **1,600** | **1,100** |

A final environmental impact statement (FEIS) accompanied the Secretary's site recommendation to the President. Subsequently, the Nuclear Waste Policy Act requires the FEIS to be adopted by the Nuclear Regulatory Commission, to the extent practicable, as part of the Commission's decision-making on the license application. Develop the mitigation action plan, and assist the Commission in adopting the FEIS. In addition, the Department will perform on-going National Environmental Policy Act compliance analyses based on changes to the design, total system performance assessment and scientific or environmental elements of the program that could affect the environmental impacts described in the FEIS or in the mitigation action plan implementation.

| | | | | |
|---|---|---|---|---|
| # | **Administrative Record, Mitigation Action Plan, and Analyses** | 1,600 | 1,600 | 1,100 |

In FY 2003, develop the mitigation action plan required by the National Environmental Policy Act, to mitigate adverse effects of repository construction and operation. In FY 2003, perform compliance analyses to determine if the FEIS needs to be supplemented or if additional NEPA documentation, such as an Environmental Assessment or Categorical Exclusion, is required. In FY 2004, perform NEPA compliance analyses based on changes to design, total system performance assessment and project scientific or environmental elements.

| | | | |
|---|---|---|---|
| **Operations/Construction** | **33,960** | **54,550** | **53,000** |

This budget element encompasses the work required to provide the support systems, infrastructure, construction, utilities, and safety systems needed to support field testing and maintain access to the site and

underground research facilities at Yucca Mountain.

**# Maintain ESF Support Systems** ..... 14,760 32,760 29,500

Maintain and operate the support systems that provide a safe work environment for scientists conducting tests in the exploratory studies facility and other underground facilities. The systems include ventilation, power distribution, water supply, compressed air supply, lighting, ground support, underground transportation, handling of materials and supplies, management of trash and refuse, sanitation, underground access control, data acquisition, fire protection, and communications. In FY 2003 and FY 2004, upgrade or replace potentially unsafe/obsolete equipment/systems in the Exploratory Studies Facility. Necessary upgrades or replacement of some of the underground systems in the ESF to incorporate it into the eventual repository design and concept of operations. The systems, such as the rail, power supply, and ventilation systems, were built as temporary construction systems and were adequate during site characterization. Since Congress designated the site, it cannot in the present condition be integrated into the repository and need to be replaced or upgraded.

**# Construction for Testing** ..... 4,000 4,000 2,000

Provide excavation, construction, and setup support for performance confirmation testing.

**# Site Utilities and Services** ..... 11,500 12,590 15,000

Provide communication services, electricity and water, collecting sewage and refuse, and janitorial services at the Yucca Mountain site. Control materials and property on the site and warehouse supplies. Operate motor pool, provide bus transportation for workers and fuel for vehicles. Provide staging for underground activities and utility feeds to underground operations. Calibrate scientific equipment. Coordinate the operations for public tours of the site. Support the Facility Representative program. Coordinate the design and construction of field maintenance facilities.

**# Site Safety and Health** ..... 3,700 5,200 6,500

Install additional engineering controls to protect workers and visitors to the site from hazards resulting from site activities. The Project will continue its rigorous safety and health efforts.

**Project Management** ..... **32,145 40,250 40,250**

This budget element encompasses the management support that enables technical and scientific programs to plan for and fund the collection of data; to analyze, process, and manage it; and to compile and synthesize it into major products and decision documents.

**# Project Control** ..... 21,795 24,795 24,795

Provide project control, cost estimating and planning; information technology systems and support; records management/document control–non-quality records; information management operations–network and computer operations; administrative support–mail, logistics, and

( Dollars in Thousands )

| | FY 2002 | FY 2003 | FY 2004 |
|---|---|---|---|
| facility/equipment management. | | | |
| # **Institutional Support** ..... | 4,200 | 5,255 | 5,255 |
| Provide institutional outreach and public relations, administration of public tours, and information centers. | | | |
| # **QA and Safety Training** ..... | 3,150 | 4,100 | 4,100 |
| Provide quality assurance training, safety training, underground training, and policy and procedure training. | | | |
| # **Lease Scoring** ..... | 3,000 | 6,100 | 6,100 |
| Maintain current office space leases in Las Vegas, Nevada. In FY 2003, the Office of Civilian Radioactive Waste Management negotiated new lease contracts. All new contracts for leased space were negotiated to reduce the lease termination liability. | | | |
| **External Oversight and Payments-Equal-to-Taxes** ..... | **19,841** | **19,841** | **11,341** |
| This budget element in FY 2004 includes funding for Payments-Equal-to-Taxes. | | | |

## Explanation of Funding Changes

| | FY 2004 vs. FY 2003 ($000) |
|---|---|
| **Regulatory and Licensing** | |
| FY 2002/2003: Suitability/Licensing and Performance Assessment | -28,317 |

The budget request decrease for the Regulatory and Licensing budget element is due to redirection in work effort toward the end of FY 2004 resulting from license application finalization; completing the license application chapters; and completing work on the performance assessment for submittal of the license application in early FY 2005. Resources will be necessary to complete development of the license application and conduct prelicensing regulatory interactions. The Total Systems Performance Assessment budget decreases in FY 2004 as the design performance calculations and total system performance assessment necessary for the license application are completed.

| | |
|---|---|
| **Cost Reductions and Systems Enhancements** | +23,000 |

Cost Reductions and Systems Enhancements was a new budget category in FY 2003 that started at a very low level. It includes performance improvements through technology development which will evaluate and prioritize scientific investigations and analyses founded in developing technologies. Cost reductions and systems efficiencies develops a process to identify potential activities that may contribute to efficiencies in the entire waste management system.

| | |
|---|---|
| **Testing and Performance Analysis** | |
| (FY 2002/2003: Core Science) | -15,780 |

The request for the Core Science budget element decreases from last year, but the emphasis has shifted from site characterization to collecting and analyzing data to clarify the science issues associated with the Key Technical Issues developed jointly with the Nuclear Regulatory Commission. Testing to support license application activities are nearly completed in FY 2003 resulting in the majority of the decrease in FY 2004 in this category.

| | |
|---|---|
| **Design and Engineering** | -14,248 |

The downward trend in the Design and Engineering budget element request from FY 2003 to FY 2004 reflects the completion of design activities for license application. Design activities will shift toward post license application design in the second half of FY 2004. The design work in support of site characterization was more conceptual than what is necessary for the license application. The design in

prior years has been focused on those areas that have little or no regulatory precedent, such as the waste package and underground operations, leaving much of the surface facilities with less design detail. For the license application, the design, which includes 35 complex surface systems, the waste package, and the underground facilities, will be more advanced and detailed for safety class systems. The license application design for non-safety systems will be general, comprehensive system descriptions, layout drawings, with more detail where there are interfaces with safety class systems. The design will focus on systems and structures both inside and outside the radiological controlled area of the repository and will include on-site transportation, on-site and off-site power and communications. The license application also requires a preclosure safety analysis, which is a defensible regulatory safety analysis of systems operations, accident analysis, and mitigation features.

More fully developed designs of the waste package, surface, and subsurface facilities to reduce licensing risks and to perform more non-nuclear balance of plant design to improve the likelihood of waste acceptance and emplacement of nuclear waste in FY 2010. The requested budget will allow more complete design to support the regulatory case and a greater level of development for the non-nuclear facilities.

In order to meet the construction schedule for waste acceptance and emplacement for FY 2010, design must continue to be developed for major nuclear facilities and systems, including the waste handling building, nuclear fuel transfer systems, waste package transportation on the surface and into the underground repository, underground tunnels, and waste package emplacement systems. The work that also must continue to be developed includes the control systems for the entire nuclear operating systems and the robotics needed for a nuclear environment. Construction specification must be developed for major systems in the Surface and Subsurface Facilities and for the waste package which will be needed for waste emplacement.

**Nevada Transportation** ..... -13,000

The Nevada Transportation was a new budget element for FY 2003 under the Yucca Mountain Project. This element has transferred to Waste Acceptance, Storage, and Transportation budget element in FY 2004.

**National Environmental Policy Act** ..... -500

The budget request for the National Environmental Policy Act budget element decreases due to the work phasing down in FY 2004.

**Operations/Construction** ..... -1,550

The request for the Operations and Construction budget element decreases slightly from FY 2003 due to the completion of site safety upgrades.

**Project Management Support** ..... 0

The Project Management Support budget category does not change from the prior year.

**External Oversight and Payments-Equal-to-Taxes (PETT)** ..... -8,500

The decrease in the External Oversight and Payments-Equal-to-Taxes in FY 2004 is due to the completion of the site characterization phase of the project.

**TOTAL FUNDING CHANGE, Yucca Mountain Project** -58,895

# Waste Acceptance, Storage and Transportation

## Mission Supporting Goals and Objectives

## Project Mission

The mission of the Waste Acceptance, Storage and Transportation (WAST) Project is to develop and implement a waste acceptance and transportation system to begin shipping the Nation's spent nuclear fuel (SNF) and high-level radioactive waste (HLW) to a repository at Yucca Mountain by 2010. The project manages the contracts between the Department of Energy and the commercial waste generators to accept SNF in exchange for a fee.

## Project Goals

The WAST Project supports the Department's **Strategic Objectives EQ2**: *Obtain requisite licenses, construct and, in 2010, begin acceptance of spent nuclear fuel and high-level radioactive wastes at the repository.*

The WAST Project develops and will implement a national transportation and waste acceptance system to move SNF and HLW from generator sites and DOE facilities to the Yucca Mountain repository. The WAST project includes an institutional program to interface with stakeholders and to implement Section 180(c) of the Nuclear Waste Policy Act, as amended. Starting in FY 2004 the WAST project will be responsible for the development of the Nevada rail line connecting the national rail system to the Yucca Mountain repository; prior to FY 2004 this was included in the Yucca Mountain work scope. The WAST project manages the spent fuel disposal contracts with the commercial waste generators and the interface between the OCRWM program and the other DOE offices that require the disposal of DOE-owned SNF and HLW.

The WAST **Program Strategic Performance Goal** included in the Program Mission EQ2-2 table is:

**EQ2-2:** Develop the national and Nevada transportation infrastructure to support the anticipated shipment of spent nuclear fuel and high-level radioactive waste to the repository, beginning in 2010.

**Performance Indicator**

- Meeting RW Program milestones. (RW)

## Project Objectives

### National Transportation

To develop a system ready to begin shipping waste in 2010, the Program will accelerate efforts that were delayed during the site characterization period. The main focus in FY 2004 will be to procure five long lead-time transport casks systems and equipment, develop operational plans, and implement a major effort to work with state, Tribal and local jurisdictions across the country in order to facilitate timely transportation of spent fuel and HLW. The transportation system will require an adequate fleet of transportation cask and transportation systems, shipping cask maintenance capabilities, operational protocols and procedures, site service plans with waste owners/generators, security procedures, site loading procedures, repository waste receipt processes, and robust emergency response or management capabilities.

Under the Nuclear Waste Policy Act the Department is also directed to provide training assistance to states through whose jurisdictions shipments will be made to Yucca Mountain. In FY 2004 the program will determine the final grant process for providing assistance to states and Tribes under Section 180(c) of the NWPA. In order to help address issues related to the transportation of radioactive waste and to provide information to the public and solicit feedback, the transportation activity also involves cooperative agreements and/or interactions with organizations representing state, Tribal, local, professional, technical, and industry interests.

### Nevada Transportation

The national rail system has been used for the last 25 years to ship radioactive waste safely across the country. However, no rail link exists between the national rail system and the Yucca Mountain site. The Program plans to build a rail line between the existing rail system and Yucca Mountain at an estimated cost of $300 million to $1 billion, depending on the corridor and alignment selected. In FY 2004 the Program will initiate the conceptual design process, develop the draft Environmental Impact Statement (EIS) for the rail alignment, and initiate the land acquisition planning.

### Waste Acceptance

The following activities will be required for the Waste Acceptance budget element: the development of plans for achieving the legal and physical transfer of SNF and HLW to the Federal Government from the owners and generators of such SNF and HLW; the implementation of agreements with the Office of Environmental Management (EM) for the acceptance of Department-owned SNF and HLW and with the Office of Naval Reactors' Navy Nuclear Propulsion Program for acceptance of naval SNF; the development of planning assumptions and recommendations for the Department's waste acceptance policy; and supporting the transportation, storage and disposal of SNF and HLW, once accepted.

### Project Management

The activities of the Project Management budget element support each of the product areas for the

WAST Project. Specifically, the Project Management budget element includes the traditional activities associated with project management, project control, and technical and programmatic integration of tasks and activities across the Project.

## Significant Accomplishments and Program Shifts

In FY 2002, with limited funding, the Department began a re-evaluation of the previous transportation approach which had been the Program's baseline planning basis since 1998. A revised approach was initiated in light of the approval of Yucca Mountain as the site for the repository and a revised scope of work for the acquisition of waste acceptance and transportation services was issued. The Program also initiated consideration of the re-establishment of cooperative agreements with regional and national groups to provide information to the public and solicit feedback on the safe transport of SNF and HLW.

Pursuant to the revised acquisition strategy, in FY 2003, the Department will procure technical and logistical contract services to assist the Department in its management and development of the transportation and waste acceptance system. With the anticipated significant increase in funding for the transportation program both the national and the Nevada transportation activities will accelerate. The program will begin to determine what the transportation cask fleet and equipment needs will be, and develop a cask acquisition strategy to ensure an adequate mix of transportation cask systems are available to support waste acceptance needs beginning in 2010.

To begin shipments in 2010 the revised acquisition approach for transportation services will require the Department to develop and operate the transportation system for the initial shipments to Yucca Mountain. In doing so, the Program will follow a similar approach that has been successfully employed by other programs within the Department, such as the Waste Isolation Pilot Plant. Once the shipment of SNF and HLW to Yucca Mountain has developed into a mature, routine activity, the Department plans to enter a second phase of transportation management that is expected to transfer more of the work to private industry on a fixed-price contractual basis, as envisioned in the previous Regional Servicing Contractor approach. Such a decision will not be made until later this decade.

Under the current approach, Federal staff, assisted by technical and logistical contractors will do the initial planning and definition of the transportation cask system and equipment requirements. Transportation casks and auxiliary equipment would be acquired through performance-based acquisitions. The initial years of operation would be more directly contracted and managed by the Department.

## Work Planned Subsequent to FY 2004

- Continued acquisition of transportation cask systems (FY 2005 - FY 2015)
- Initiate preliminary design of cask maintenance facilities (FY 2005)
- Develop Section 180(c) grant application packages for distribution to eligible jurisdictions and conduct interactions with state and Tribal representatives regarding Section 180(c) implementation

(FY 2005 - On-going)

- Complete required operational and site servicing plans (FY 2005 - On-going)
- Complete Nevada conceptual rail design (FY 2006)
- Award design/build contract for the Nevada rail (FY 2006)
- Award design/build contract for the Cask Maintenance Facility, if required (FY 2006)
- Select Nevada rail corridor alignment (FY 2006)
- Complete land acquisition for the Nevada rail (FY2006)
- Procure transportation services (FY 2008)
- Conduct training on and operational readiness testing of the cask fleet and equipment, and repository interfaces (FY 2008-2010).
- Test and commission the rail line in Nevada (FY 2009-2010)
- Conduct interactions with states, Tribes, local governments, and professional transportation organizations on issues related to the transportation of SNF and HLW (FY 2005-2010).

# Funding Schedule

(Dollars in Thousands)

| Project Budget Elements: | FY 2002 | FY 2003 | FY 2004 | $ Change | % Change |
|---|---|---|---|---|---|
| Transportation | 1,938 | 25,272 | 65,000 | +39,728 | +157.2% |
| National Transportation | 1,938 | 25,272 | 47,000 | +21,728 | +86.0% |
| Nevada Transportation | 0 | 0 | 18,000 | +18,000 | n/a |
| Waste Acceptance | 1,615 | 3,328 | 6,300 | +2,972 | +89.3% |
| Project Management | 550 | 1,600 | 1,800 | +200 | +12.5% |
| Total, Waste Acceptance, Storage & Transportation | 4,103 | 30,200 | 73,100 | +42,900 | +142.1% |

## Detailed Program Justification

| | (Dollars in Thousands) | | |
|---|---|---|---|
| | FY 2002 | FY 2003 | FY 2004 |
| **Waste Acceptance, Storage and Transportation** ..... | **4,103** | **30,200** | **73,100** |
| **National Transportation** ..... | **1,938** | **25,272** | **47,000** |
| ■ **Acquisition of WA&T Services and Equipment** | 1,838 | 3,000 | 32,000 |

Requested funding in FY 2004 provides resources needed to begin the initial procurement of cask fleet and to place orders for long-lead time transportation cask systems and equipment for commercial spent fuel. The procurement contracts will be multi-year contracts requiring full funding prior to award. Long lead-time items would include procurement of specialty materials and process development. In addition, such items as revisions to the Certificates of Compliance for currently NRC-certified transportation cask systems might be needed. Acquisition of long-lead cask systems for DOE-owned SNF and HLW will be initiated. The funding level supports acquisition of cask systems that will meet waste acceptance rates currently planned for the Yucca Mountain program.

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|---|---|---|---|
| ■ **Operations** ..... | 0 | 19,272 | 7,500 |

In FY 2003, the procurement strategy for waste acceptance and transportation services and equipment was finalized. In FY 2003 the transportation system concept of operations was developed to guide the development of the transportation system and provide a background for the types of casks needed, the mix of cask types, cask maintenance operations, and other aspects of the transportation system. In FY 2003 the Transportation System Requirements Document was prepared to specify the regulatory and programmatic requirements for the OCRWM transportation system as a precursor to preparation of any procurement documents for services or equipment. The Program initiated financial and technical support for the Nuclear Regulatory Commission's Package Performance Study to be performed at Sandia National Laboratory.

In FY 2003, cask maintenance options were developed and a preliminary evaluation performed. A final evaluation of the cask maintenance options will be performed and an option will be selected in FY 2004. The Department completed a Transportation Strategic Plan in 2003 .

In FY 2004, the program will: initiate preparations for acquisition of transportation and logistics services; determine the approach to be utilized for performing cask maintenance, and if required develop the cask maintenance facility conceptual design and requirements and prepare the request for proposals (RFP) for the cask maintenance facility; develop initial site specific service plans in consultation with utility contract holders for initial shipments; update the near-site transportation infrastructure assessment; survey and assess the national and international cask manufacturing

capabilities; develop facility interfaces and servicing equipment needs for acceptance at DOE-EM sites; develop near-site transportation requirements for DOE sites; and provide quality assurance support to reflect increase in fleet and equipment acquisition activities.

In FY 2004 the number of each type of casks to be procured and the timing for their procurement will be determined based on the types of fuel expected to be received from utilities and DOE. Budget estimates will be developed to support cask system acquisition. Plans for acquisition of cask systems will continue to be developed. Emphasis will be on those cask designs that still need to be developed and certified. These include casks for shipment of DOE fuel types, legal-weight truck casks for boiling water reactor (BWR) fuel, and truck and rail casks for high burn-up fuel. Procurement specifications will be developed and requests for proposals for cask design, certification, and fabrication will be issued.

In FY 2004, a generic site servicing plan will be developed. Based on this generic plan, specific plans will be developed for those sites expected to be visited in the first few years of repository operation. Work currently underway at Sandia National Laboratories and Oak Ridge National Laboratory will continue to be supported. This includes safeguards and security, safety performance, operations and logistics, standards development, and risk methodology.

Develop quality assurance plans and requirements for supporting transportation fleet acquisition activities. Perform vendor audits as required to meet NRC requirements.

- **Institutional**

| | | | |
|---|---|---|---|
| State, Local and Tribal Interaction ..... | 0 | 2,200 | 6,500 |

In FY 2003, the Program resumed interactions with state, Tribal, and local governments, other Federal agencies, and transportation professional organizations to promote understanding and build public confidence.

Funding in FY 2004 to support interactions will continue at an enhanced level. The Program will fund cooperative agreements with regional groups to address institutional and technical transportation operations issues. Attend meetings with the cooperative agreement groups to keep them informed of the status of the transportation program and to hear their concerns about the program; track resolution of institutional issues with state, Tribal, and transportation professional organizations; and promote understanding and build public confidence.

Continue activities assessing barge, rail, truck, and intermodal institutional issues. Support Transportation External Coordination Working Group meetings, technical workshops, and public information needs. Maintain the transportation sections of the OCRWM website. Prepare, publish, and distribute public information brochures and fact sheets about waste transportation. Interact with the State of Nevada and local governments regarding issues related to Nevada transportation.

- **Implementation of NWPA Section 180(c)** ..... 100 800 1,000

In FY 2003, the program evaluated emergency response and first responder training available to

states and tribes from the Federal government for the shipment of hazardous materials.

In FY 2004, based upon the evaluations made in FY 2003, the Department will develop the final grant process for providing assistance under Section 180(c) of the NWPA, and develop a preliminary estimate of which states/tribes will be eligible for grants, and when eligible jurisdictions will begin to participate in the grant program.

| | | | |
|---|---|---|---|
| **Nevada Transportation** ..... | **0** | **0** | **18,000** |

Several activities will be conducted, with sufficient resources to greatly increase the probability of meeting the necessary rail alignment record of decision and critical decision dates, such that a branch rail line in Nevada will be completed and operating by 2010. (This assumes timely decisions are made and the mode and corridor ROD's are completed on schedule).

Activities in FY 2004 would include the following:
- Implementation of NEPA public scoping for a specific rail alignment.
- Begin development of a Draft EIS for a rail alignment to be completed in FY2006.
- Begin implementation of the land acquisition strategy for acquiring land needed for the rail corridor and alignment.

| | | | |
|---|---|---|---|
| ■ **Nevada Rail Conceptual Design and Critical Decision Support** ..... | 0 | 0 | 11,200 |

In FY2004, initiate conceptual design activities to support conceptual design submittal and complete NEPA documentation, land acquisition, and schedule. Meeting this schedule is necessary to achieve completion of Nevada rail in 2010.

Perform topographical field surveys necessary to support mapping, development of plan and profile drawings, and to support hydrological analysis. Develop plan and profile drawings and conduct a hydrological analysis of the rail corridor to support development of the conceptual design package and NEPA documentation.

Perform field investigations to obtain data necessary for structural design. Identify design criteria, perform rail design calculations, and develop a conceptual design of structures for the conceptual design package.

| | | | |
|---|---|---|---|
| ■ **Nevada Rail Geotechnical Field Surveys** ..... | 0 | 0 | 900 |

In FY 2004, initiate geotechnical field surveys to support development and completion of a geotechnical report for conceptual design package submittal on schedule.

Conduct geotechnical drilling work and perform soils testing for the geotechnical report.

| | | | |
|---|---|---|---|
| ■ **Nevada Rail NEPA Documentation and Interactions Support** ..... | 0 | 0 | 3,200 |

Provide geographical information systems support for production of maps, land use assessments, environmental justice assessments, and population assessments for NEPA documentation. Provide

enhanced engineering and public interactions support during the NEPA documentation process.

Support public scoping process, including comment response, and public involvement.

Perform NEPA documentation records management and provide enhanced support for public interactions in the NEPA documentation process.

Prepare biological, socioeconomic, and land use assessment to support NEPA documentation, and summarize alignment information for use in NEPA documentation.

- **Nevada Rail Environmental Field Survey Support** ..... 0 0 400

  Support interactions with Bureau of Land Management (BLM), Fish Wildlife Service (FWS), and Corps of Engineers (COE) to determine requirements for environmental field surveys necessary for NEPA documentation. Support environmental field surveys for T&E species, BLM sensitive species and vegetation. Develop community maps, wetlands/waters maps, and other information required by BLM and FWS. Provide additional field survey support to sustain conceptual design.

- **Nevada Rail Obtain Environmental Permits**..... 0 0 400

  Prepare and submit applications for applicable State of Nevada and local permits required for environmental surveys, flood plains and wetlands surveys, geotechnical surveys, and topographical field surveys.

- **Nevada Rail Quality Support** ..... 0 0 300

  Provide quality support during development of the conceptual design and NEPA documentation.

- **Nevada Rail Land Acquisition** ..... 0 0 1,600

Prepare a land acquisition case file required by BLM for federal land within the rail corridor. Prepare and file a land acquisition application with the BLM for federal land within the rail corridor. Provide funding to the BLM for the timely review of the land acquisition case file, and provide additional information to the BLM as requested.

Provide funding to the COE to obtain private lands within the rail corridor in a timely manner, and provide additional information to the COE, as requested.

| | | | |
|---|---|---|---|
| **Waste Acceptance** ..... | **1,615** | **3,328** | **6,300** |
| ■ **RW Interface Coordination** ..... | 175 | 108 | 175 |

Manage interface/liaison with other affected elements of the Civilian Radioactive Waste Management System.

| | | | |
|---|---|---|---|
| ■ **Waste Acceptance Planning** ..... | 640 | 1,120 | 2,525 |

Finalize waste acceptance operational requirements to support acquisition of transportation cask fleet and associated equipment. Maintain SNF inventory assumptions for commercial SNF and

DOE-managed SNF and HLW. Develop requirements for emerging commercial SNF waste forms.

| | | | |
|---|---|---|---|
| ■ **Standard Disposal Contract Management** ..... | 450 | 950 | 1,000 |

Implement the Standard Disposal Contract and other agreements; validate and disseminate utility supplied SNF discharge/storage data; and, update the Utility Spent Nuclear Fuel Discharge Projections and Analysis document. Update verification requirements as required. Negotiate and implement modifications as required in individual Purchaser contracts by working with the individual Purchasers. These contract modifications would facilitate the acceptance and transportation of SNF from commercial nuclear utilities.

| | | | |
|---|---|---|---|
| ■ **DOE Waste Acceptance** ..... | 350 | 250 | 2,600 |

Implement the responsibilities established in the Memoranda of Agreement for acceptance of DOE-owned SNF and HLW and Navy spent fuel. This includes issuance of HLW data needs; development of acceptance capacities for DOE and Navy materials requiring acceptance, transportation, disposal and establishment of fee payment schedules. Coordinate with DOE-EM to identify issues that may arise from changes in EM waste management programs. Participate in extensive interactions with all EM and affected sites. Perform technical analyses and assessments as required to incorporate evolving DOE waste forms into the RW planning basis. Update the Waste Acceptance System Requirements Document and develop general specifications for new DOE waste forms to allow for accelerated DOE site closure.

| | | | |
|---|---|---|---|
| ■ **Litigation Support** ..... | 0 | 900 | 0 |

Department of Justice support for litigation involving Civilian Radioactive Waste Management system.

| | | | |
|---|---|---|---|
| **Project Management**..... | **550** | **1,600** | **1,800** |

Additional project management supported will be required because of the increased funding for the transportation activities needed to implement transportation operations in 2010, and to ensure that adequate management is in place to track increased assets being developed for transportation.

| | | | |
|---|---|---|---|
| ■ **Project Control** ..... | 160 | 1,160 | 400 |

Provide cost, schedule, planning, and integration related tools and services: cost and schedule baseline management; strategic and program plan development/update; and project management documentation. Provide project control functions by monitoring cost, schedule and technical performance, performing variance analyses, and developing and implementing corrective actions.

Develop total program cost estimate and associated schedule for Nevada rail to support procurement of a design build contractor. Provide project planning and documentation for Nevada rail to support final design, construction, and operations. This funding-level is required for early procurement and follow-on activities, including increased work scope, cost, schedule and technical performance monitoring and analysis.

| | | | |
|---|---|---|---|
| ■ **Program Planning** ..... | 290 | 290 | 1,000 |

Develop the Waste Acceptance, Storage and Transportation Annual Plan, and support the project validation review process to implement an accelerated transportation operations effort. Update the long range plan to support increased development and early procurement activities needed to implement transportation and acceptance operations in 2010.

- **WAST Life-Cycle Cost Estimate** ..... 100 150 400

  MaintainWAST Project life-cycle cost estimate, support the Program's total system life-cycle cost evaluation, and update *Waste Acceptance, Storage and Transportation Project Life-Cycle Cost Report*; and update models and baseline estimates to better reflect current transportation strategy. All should reflect current transportation strategy.

## Explanation of Funding Changes

| | FY 2004 vs. FY 2003 ($000) |
|---|---|

**National Transportation** ..... +21,728

The significant increase in funding in FY 2004 will fund the initial procurement of transport casks, and auxiliary equipment and accelerate operational capability. Full-funding for the acquisition of long-lead cask systems is necessary in FY 2004 to allow the initiation of cask fleet procurement, which will facilitate waste acceptance in the post-2010 time-frame. The purchase of transportation cask systems including buffer and escort cars and site-specific service equipment will permit the Program to meet waste acceptance rates currently planned for 2010, and will also permit the Program to initiate the acquisition of transportation services and logistics services in FY 2004, and increase interactions with state, local Tribal governments, other Federal agencies, and the transportation professional organizations.

**Nevada Transportation** ..... +18,000

Starting in FY 2004 the WAST project is responsible for the development of a Nevada rail line from the national rail system to the Yucca Mountain repository. In FY 2003 $6 million was provided to the Yucca Mountain Project to initiate this project. In FY 2004 the program will initiate conceptual design activities, conduct geotechnical field surveys, conduct the public involvement for the NEPA process, apply for environmental permits for the rail line, and prepare a land acquisition case file required by BLM.

**Waste Acceptance** ..... +2,972

Support for the waste acceptance process including maintaining the SNF storage data and assumptions; updating industry storage forecasts and development of waste acceptance criteria will be reduced. Activities to support start of waste acceptance will be initiated. Funding includes support of ongoing litigation. Support for the waste acceptance process including determining the transportation equipment and services through modifications and/or deviations to the Standard Disposal Contract, as required. Additional support to develop inventories, waste acceptance requirements and general specifications for emerging commercial and DOE waste forms. Negotiate and implement modifications to the Standard Contract.

**Project Management** ..... +200

A higher level of project management will be required for WAST because of the increased number of activities needed to implement transportation operations in 2010.

| | |
|---|---|
| **Total Funding Change, Waste Acceptance, Storage and Transportation** ..... | +42,900 |

# Program Management & Integration

## Mission Supporting Goals and Objectives

Program Integration provides management support to the Program Director, the Yucca Mountain Site Characterization Project, and the Waste Acceptance, Storage and Transportation Project. Program Integration is comprised of Quality Assurance, Program Management, and Human Resources and Administration. These offices are responsible for quality assurance, system integration, regulatory integration, strategic planning, international waste management, program management, human resource and development, audits, education and information, and information management.

## Quality Assurance

The Quality Assurance element identifies and ensures implementation of federally mandated requirements for Nuclear Quality Assurance (QA) applicable to the Civilian Radioactive Waste Management System (CRWMS) program activities related to radiological health and safety and waste isolation. It establishes and maintains a Quality Assurance Program formulated to ensure quality in activity planning and performance through the developed end-products. Documented compliance with these quality requirements establishes confidence in the effective implementation of the CRWMS program to support the execution and eventual licensing and/or certification of high-level nuclear waste operation activities.

Activities associated with the QA function are performed by personnel not associated with the performer organization (NRC independence requirements), and are directly related to the acceptability of the technical products and services provided by the performer organization. The Quality Assurance element achieves this independence by requiring the Program's Management and Operations contractor (M&O) to establish a Quality Assurance organization, independent of the line functions, to support achievement of quality in M&O products, services and activities. Further independence (as required by NRC regulation) is achieved by utilizing a DOE Quality Assurance support contractor responsible for establishment/maintenance of DOE Quality Assurance Requirements and Policy to be implemented by the M&O and other participants and by performance of independent oversight (audits, surveillance, and reviews) of M&O and other participant products, services, and activities. Quality Assurance is not an administrative function, but rather a necessary step (per NRC regulation) to assure technical acceptability and confidence in fulfilling our mission to protect the public, workers, and the environment.

## Program Management

### System Integration

The Systems Integration element focuses on the development of an integrated waste management system. Systems analyses are conducted to ensure that the acceptance and transportation services

components are compatible with the repository and waste package design activities. These system components must perform as a coordinated single system that meets mission requirements, and is safe, efficient, reliable, and cost-effective. Systems Integration also coordinates policy, interprets technical requirements, and manages Program requirement documents. The primary effort also includes maintaining current descriptions of the overall waste management system, its components, and interfaces to enhance communication among parties responsible for individual system components.

Systems Integration also provides support and strategic planning assistance to the Director and project offices. This element annually determines the adequacy of the fee charged to generators of commercial Spent Nuclear Fuel (SNF), in accordance with the Nuclear Waste Policy Act of 1982. Periodically, the Department's recommendation requires the conduct of Total System Life-Cycle Cost (TSLCC) analyses to support the decision of whether program revenues are sufficient to cover the cost of the program. Additionally, this element conducts systems studies, tradeoff studies, sensitivity studies, and contingency analyses to ensure that the system-wide impacts of proposed changes are considered; alternative or contingency system configurations and concepts are evaluated. In addition, Systems Integration manages all program-level baseline change control board activities and monitors YMSCO project-level baseline control board activities.

**Regulatory Integration**

The Regulatory Integration element ensures that the activities leading to the final waste management system, including commercial and Department-owned nuclear materials, are consistent with the regulatory guidance provided by the governing authorities. This element ensures project activities are consistent with Departmental policy and environmental impact statements for other Department programs. The focus is on plans and strategies for compliance with applicable statutes and regulations. The approach to accomplishing this mission is to conduct regulatory reviews and continue interactions with several external oversight agencies, including the Nuclear Regulatory Commission (NRC), and the Environmental Protection Agency (EPA). The external participation includes addressing management and technical issues related to the civilian radioactive waste management system. Interactions with the NRC on licensing issues are critical to the success of the overall program schedule as they directly affect the NRC licensing process for program activities and facilities.

**Strategic Planning**

The Strategic Planning element supports the Director's program planning requirements by integrating policy direction received from the Administration, Congress, and the Office of the Secretary into an overall program strategy. It provides resources for Program compliance with Departmental obligations resulting from the Government Performance and Results Act of 1993 (GPRA) and the Government Management Reform Act of 1994 (GMRA), including the Department's Strategic Plan, Annual Performance Plan, and annual Performance and Accountability Report. It supports the development and maintenance of multi-year and annual planning documents such as the OCRWM Program Plan. Strategic planning also provides funding for responses to program inquiries and links requirements with external program oversight parties and liaison activities within the Department.

**International Waste Management**

The International Waste Management element keeps the Program abreast of international developments and new ideas, and affords OCRWM the opportunity to provide technical exchanges and discuss strategies for disposition of nuclear materials. The element assists in preparing for bilateral meetings and provides the Program's inputs to various international fact and information books.

This element maintains up-to-date information on other countries' nuclear energy and nuclear waste management programs. In addition, collaborative work on repository issues with the Russian Federation is supported.

**Program Management**

The Program Management element provides the basis for prioritizing, and allocating resources; defining, costing, and executing work scope and schedules; and monitoring, analyzing, and reporting Program performance. The key components of this element are business and management center planning, formulating and executing budgets and annual work plans, and establishing Program-level cost and schedule.

## Alternative Funding Proposal

Historically appropriations resulted in significant shortfalls from the budget requests. Between FY 1995 – 2002 appropriations resulted in $564 million less than requested. To enable operations by 2010 funding between 2004 – 2010 will require an average of $1.3 billion per year from the Nuclear Waste Fund and the Defense Nuclear Waste appropriations. This is significantly higher (three times) than previous annual appropriations. There is currently in excess of $14 billion in the Nuclear Waste Fund, and the program will continue to collect over $1.5 billion annually through fees and interest. The Defense Nuclear Waste Appropriations will also increase significantly if waste is to be accepted from sites in 2010. Having the funds does not ensure, however, that adequate appropriations will be provided.
Realizing that the large funding increases needed for licensing, construction and transportation may be difficult to fit within the current budget procedures, a change in the funding mechanism is essential to the success of the Program. The Department is supporting the implementation of an alternative means of funding to ensure that the funds are used prudently and are available for their intended purpose.

The proposal would fund the capital assets needed through 2010. There would be continued Congressional annual oversight by continued annual appropriation.

The program will also increase its capital asset planning. The program will work closely with the Office of Management and Budget to identify, acquire, and manage the funding requirements for the construction phase efficiently, recognizing that multi-year investments are necessary to complete useful segments and to propose budget authority and budget obligation schedules accordingly.

## Human Resources and Administration

### Audits, Reports, Education and Information

The Audits, Reports, Education and Information element includes diverse activities that support the Program's mission and ensure compliance with legislative requirements to: (1) develop and submit an Annual Report to Congress; (2) develop and submit audited financial statements to the Department's Chief Financial Officer, (3) develop and submit the Annual Assurance Memorandum to the Secretary; and (4) develop and submit to Congress, OMB and GAO, Departmental responses to recommendations in GAO and DOE IG audit reports. This element also includes the conduct of an annual, independent quality assurance management assessment of OCRWM and Program participants to ensure the effectiveness and adequacy of OCRWM's quality assurance program. Implementation of an appropriate investment strategy and the prudent management of the Nuclear Waste Fund investment portfolio are also essential to fulfilling the Program's fiduciary responsibility under the Nuclear Waste Policy Act. Maintenance of the OCRWM Home Page supports the Nuclear Waste Policy Act objective of keeping the public informed of Program activities, and assist in building customer, stakeholder, and public confidence in and support for the Program.

The Program's Historically Black Colleges and Universities Undergraduate Scholarship and Radioactive Waste Management Graduate Fellowship Programs support the Department's compliance with Executive Order 12677 and the Secretary's science education initiative, as well as ensuring that the Program's goal for a diversified workforce of highly specialized scientists and engineers will be met in the future.

### Information Management

The Information Management element encompasses the strategic application of information technology. It supports the accomplishment of the Program's mission by providing integrated information systems, solutions and services that enhance the productivity of human resources, drive business process improvement efforts, and reduce overall Program costs and Departmental strategic alignment initiatives. Information management includes computer security; designing and developing information systems to ensure a reliable infrastructure for effective and timely access to, and communication of, information; integration and integrity of technical, regulatory, management, and financial information; streamlining Program work processes through automation to reduce the paperwork burden and increase the productivity and job satisfaction of human resources; promoting an organizational culture based on planning, compliance with Federal and Departmental regulations, and responsiveness to Program dynamics; and supporting the collection and storage of records required for licensing.

# Funding Schedule

( dollars in thousands )

| | FY 2002 | FY 2003 | FY 2004 | $ Change | % Change |
|---|---|---|---|---|---|
| Quality Assurance | 6,400 | 6,918 | 10,500 | +3,582 | +51.8% |
| Program Management | | | | | |
| Systems Integration | 2,565 | 3,833 | 3,833 | 0 | 0.0% |
| Regulatory Integration | 913 | 913 | 913 | 0 | 0.0% |
| Strategic Planning | 1,122 | 1,187 | 1,187 | 0 | 0.0% |
| International Waste Management | 933 | 933 | 933 | 0 | 0.0% |
| Program Management | 523 | 655 | 1,105 | +450 | +68.7% |
| Total, Program Management | 06,056 | 07,521 | 7,971 | +450 | +6.0% |
| Human Resources and Administration | | | | | |
| Human Resources Development | 20 | 30 | 30 | 0 | 0.0% |
| Audits, Reports, Education, Information and QAMA | 730 | 1,231 | 1,211 | -20 | -1.6% |
| Information Management | 4,805 | 3,991 | 3,991 | 0 | 0.0% |
| Total, Human Resources Administration | 05,555 | 05,252 | 5,232 | -20 | -0.4% |
| Total, Program Management & Integration | 018,011 | 019,691 | 23,703 | +4,012 | +20.4% |

# Detailed Program Justification

| | FY 2002 | FY 2003 | FY 2004 |
|---|---|---|---|
| **Program Management & Integration** | **18,011** | **19,691** | **23,703** |
| **Quality Assurance** | **6,400** | **6,918** | **10,500** |

- Provide in-process (i.e., during product development) quality assurance support to ensure Nuclear Regulatory Commission quality assurance requirements are appropriately incorporated into technical products.
- Support quality assurance interface within the Program and external to the Program with other DOE high-level waste producing entities.
- Support the maintenance of the Office of Civilian Radioactive Waste Management (OCRWM) quality assurance program and independent oversight of work performance.

| | | | |
|---|---|---|---|
| **Program Management** | **6,056** | **7,521** | **7,971** |
| ■ **Systems Integration** | 2,565 | 3,833 | 3,833 |

- Revise the Civilian Radioactive Management System Requirements Document (CRD) to incorporate updated requirements, policies, and program level design solutions to support License Application (LA).
- Revise the CRWMS Total System Description (TSD) document to reflect latest revisions of top-level documents (e.g. CRD and Project Requirements Documents).
- Ensure proper implementation of the Major System Management Policy (MSMP).
- Review project requirements to ensure proper implementation of Program requirements.
- Prepare white papers assessing issues pertaining to the CRD and provide Systems Engineering support as required to process Systems Integration documents.
- Provide support for quality assurance procedures and activities as required for License Application.

**Systems Analysis**

- Prepare and publish Total System Life Cycle Cost (TSLCC) and Fee Adequacy analyses to support LA.
- Conduct, review, and issue systems engineering logistics, systems optimization and waste stream analyses to support National Transportation Planning and LA.

Conduct systems studies, support value engineering studies, perform tradeoff studies, sensitivity studies, and contingency analyses to support National Transportation planning and LA.

- Support Independent Cost Estimate (ICE) review and reconciliation process for updated

TSLCC.

**Configuration/Baseline Management**

- Provide management and technical support to the Program and project-level Change Control Boards (CCB) to develop and process changes to the Program and project baselines and related control documents to support LA.

| | | | |
|---|---|---|---|
| ■ **Regulatory Integration** | 913 | 913 | 913 |

- Support project activities associated with the planning, development, review, and submittal of a license application and final environmental impact statement, including completing a regulatory compliance plan, developing a licensing case for each regulatory requirement, confirming adherence to applicable regulatory guidance, tracking completion of prior commitments made to the regulatory agency and staff, reviewing the licensing documents, and participating in public meetings to describe the license application process and the completed licensing documents.
- Analyze proposed regulatory changes to determine impact on the Program and ensure compliance with newly promulgated rules. Provide continued support on emerging regulatory issues that will arise as the projects continue to move forward.
- Establish Program-level regulatory policy, licensing strategy, and requirements related to Safeguards and Security (S&S) and support implementation of requirements.
- Support day-to-day interactions with the project and NRC, including the ACNW, on the planning of and mechanics for the license application review, the interrogatory and response process, technical interchanges on issues raised in the license application review, documentation of closure of issues, and submittal of amendments to the license application.
- Coordinate and participate in interactions with external agencies, such as: the Nuclear Regulatory Commission (NRC), the Environmental Protection Agency, and the NRC's Advisory Committee on Nuclear Waste (ACNW). These interactions include addressing management and technical issues related to the civilian radioactive waste management system.
- Coordinate and integrate Program environmental, safety, and health activities to ensure compliance with Departmental directives and policies, EPA standards, NRC licensing requirements, and Occupational Safety and Health Act (OSHA) standards. Major activities include coordination of environmental impact statements from other Departmental Offices involving disposal of spent nuclear fuel, high-level waste and other Department-owned radioactive materials.
- Support project regulatory assessments and integration of storage, transportation, and disposal considerations for waste forms managed by other Department offices, such as Environmental Management, Fissile Materials Disposition (NN-60), and Nuclear Energy (Naval Reactors), to ensure consistency with applicable regulatory requirements.
- Provide coordination with Nuclear Regulatory Commission on issues related to the NRC's adoption of DOE's environmental impact statement for a repository at Yucca Mountain.

| | | | |
|---|---|---|---|
| ■ **Strategic Planning**..... | 1,122 | 1,187 | 1,187 |

- Respond to program inquiries and links requirements with external program oversight parties and liaison activities with the Department. Support three Program planning workshops. Assist in developing and maintaining Program planning documents, such as the Program Plan. Manage the Memorandum of Agreement with the U.S. Geological Survey for provision of analytical and technical support.

| | | | |
|---|---|---|---|
| ■ **International Waste Management**..... | 933 | 933 | 933 |

- Provide expert input to international program planning, management and policy development for institutional, organizational, and programmatic activities
- Provide support in the development of and maintenance of a High Level Waste (HLW) and Spent Nuclear Fuel (SNF) baseline for programs in other nations and international organizations
- Provide for the identification, development and implementation of international initiatives, including international expert contractor personnel, International Review Group, reports and meetings
- Provide support to the OECD/NEA in the development of the Thermochemical Database (TDB)
- Provide support in the DOE-Minatom waste management agreement activities related to the Departments interaction with Russia
- Provide direct support to the coordination of international activities, as directed by RW-46.

| | | | |
|---|---|---|---|
| ■ **Program Management**..... | 523 | 655 | 1,105 |

- Improve program and project management systems. Maintain program management policy document, and support implementation of new Departmental project management policy and requirements.
- Formulate and execute Program budget and annual work plans.
- Establish Program-level cost and schedule baselines and monitor and report the Program baseline performance.

| | | | |
|---|---|---|---|
| **Human Resources and Administration**..... | **5,555** | **5,252** | **5,232** |
| ■ **Human Resources Development**..... | 20 | 30 | 30 |

- Purchase needed supplies, non-computer equipment, publications, and services.

| | | | |
|---|---|---|---|
| ■ **Audits, Reports, Education, Information and QAMA**..... | 730 | 1,231 | 1,211 |

- Develop reports and other documents required by Congress or the Department, such as the Program's Annual Report to Congress, audited financial statements, annual Federal Managers' Financial Integrity Act (FMFIA) report, responses to General Accounting Office (GAO) and DOE IG audit recommendations, and Freedom of Information Act (FOIA) requests. Manage the Nuclear Waste Fund investment portfolio by providing monthly investment instructions to the CFO for implementation. Comply with executive orders and support the Department's

education initiatives by conducting a Historically Black Colleges and Universities (HBCU) Undergraduate Scholarship Program and the Radioactive Waste Management Graduate Fellowship Program. Provide Program information to customers/stakeholders/public through the OCRWM Home Page.

| | | | |
|---|---|---|---|
| ■ **Information Management** ..... | 4,805 | 3,991 | 3,991 |

- Maintain existing information systems and networks. Validate Information Management (IM) Strategic Plan; revise/update IM Multi-Year Implementation Plan; develop integrated IM Annual Planning Guidance; conduct IM short-range planning and integrated IM budget planning.
- Complete implementation phase 2 of the Integrated Information and Infrastructure Project. This effort completes the re-engineering of the Records Management, Document Management, and Web Publishing processes and initiates the improved processes and associated technology solutions.
- Upgrade telecommunications and basic computing infrastructures.
- Continue the development and implementation of the Program's information architecture to ensure compatibility with the Department's information architecture.

## Explanation of Funding Changes

| | FY 2004 vs. FY 2003 ($000) |
|---|---|
| **Quality Assurance** | +3,582 |
| The increase is related to providing additional quality assurance inspection services on the construction and field activities; independent assessment on Integrated Safety Management (ISM) activities in accordance with ISM quality assurance program; and increased coverage on vendor quality assurance activities. | |
| **Program Management** | +450 |
| The increase is required for formulating and executing budgets and annual work plans, establishing Program-level costs, schedules, and technical baseline in support of the Yucca Mountain Site Characterization Office. | |
| **Human Resources and Administration** | -20 |
| The decrease is due to the reduction in the number and type of reports, education materials, and information documents scheduled for revision in FY 2004. | |
| **Total Funding Change, Program Management and Integration** | +4,012 |

# Program Direction

## Mission Supporting Goals and Objectives

Program direction provides overall direction and administrative support for the Office of Civilian Radioactive Waste Program to manage and dispose of the Nation's spent nuclear fuel and high-level radioactive waste. Program Direction has been grouped into five categories: 1) Salaries and Benefits; 2) Travel; 3) Other Related Expenses; 4) Working Capital Fund; and 5) Support Services.

## Salaries and Benefits

This element includes compensation for regular salaries and wages paid directly to federal civilian full-time permanent and other than full-time permanent employees, other payments that become a part of the employee's basic pay rate and other personnel compensation such as overtime, holiday pay and cash incentive awards. Benefits includes payments such as the employer's share of employee retirement, health and life insurance, accident compensation, Federal Insurance Contribution Act taxes, and Federal Retirement Thrift Savings Plan. Benefits also include payments for former employees such as severance pay to employees involuntarily separated, and voluntary separation incentives. This includes payments to the unemployment fund, payments of nine percent of final basic pay to the civil service retirement fund for employees who took the early-out or buy-out authority, and payments to the Employees health benefits fund for annuitants.

## Travel

This category provides funding for the transportation of Government employees, their per diem allowances while in authorized travel status, and other expenses incidental to travel that are to be paid by the Government either directly or by reimbursing the traveler.

## Other Related Expenses

Other related expenses includes funding for building maintenance, rents, communications, utilities, computer/video support, printing and graphics, photocopying, postage, and supplies. The Working Capital Fund was established in FY 1997 by the Office of Human Resources to allocate the cost of common administrative services to the recipient organizations. Activities included in the Working Capital Fund include automated office support, telephone services, postage, printing and graphics, supplies, photocopying, building occupancy, contract closeouts and contract audits.

## Support Services

*Quality Assurance Technical Support* – Provide support in: the establishment and maintenance of NRC required OCRWM QA Program and Policy. Includes developing and maintaining the OCRWM Quality Assurance Requirements and Description, developing QA procedures, and maintaining required QA databases.

Support the performance of independent QA audits surveillance, and review of M&O and other participant products, services, and activities.

*Management & Technical Support Services* - Provides an independent technical review capability of the work accomplished by the DOE National Laboratories and the management and operations contractor conducting the characterization of Yucca Mountain and the design and licensing of the potential geologic repository. Technical support services include the review and analysis of technical studies and papers and regulatory documents and reports, such as contractor deliverables, Site Recommendation, and License Application. Facilitates independent peer reviews of plans, processes, and predictive models. Provides construction support services to review and analyze the designs and documents supporting licensing and construction. Provides Management services including independent analysis of the managing and operating contractor work plans, schedules and cost estimates.

Specific technical expertise required by OCRWM include environmental, safety and health; NEPA statutory requirements; licensing and NRC statutory framework; design, engineering, design analyses, design basis documents, and process models; scientific programs relating to geology, hydrology, rock mechanics, tectonics, and performance assessments; operations and construction; and project control; procurement analysis, and information management.

*Automated Data Processing Support* - Provide services to assist in the operation and management of the Office of Civilian Radioactive Waste Management communications network and computer facilities, including Web page development, computer hot line and help desk support, software and hardware installation and maintenance, and early evaluations of enhanced software.

*Quality Assurance Management Assessment* - Assists OCRWM in the annual quality assurance management assessment to comply with NRC licensing regulations.

*Department of Energy Support Services* - Provide automated data processing support services for Headquarters.

*Technical Analysis Support Services* - Process and verify utility fee payment data and develop quarterly revenue projections.

*Administrative Support Services* - Provide administrative services to the Yucca Mountain Site Characterization Office, including coordination of mail, correspondence, records submittal, office supplies, and facilities management services.

# Funding Schedule [a]

( dollars in thousands )

| | FY 2002 | FY 2003 | FY 2004 | $ Change | % Change |
|---|---|---|---|---|---|
| Nevada Operations Office | | | | | |
| Salaries and Benefits | 601 | 545 | 857 | +312 | +57.2% |
| Total, Nevada Operations Office | 601 | 545 | 857 | +312 | +57.2% |
| FTEs | 6 | 6 | 6 | 0 | 0.0% |
| Other DOE Matrix Support | | | | | |
| Salaries and Benefits | 1,400 | 1,312 | 2,284 | +972 | +74.1% |
| Travel | 7 | 7 | 10 | +3 | +42.9% |
| Total, Other DOE Matrix Support | 1,407 | 1,319 | 2,294 | +975 | +73.9% |
| FTEs | 17 | 15 | 16 | +1 | +6.7% |
| Headquarters-OCRWM | | | | | |
| Salaries and Benefits | 6,536 | 7,206 | 8,570 | +1,364 | +18.9% |
| Travel | 260 | 260 | 290 | +30 | +11.5% |
| Working Capital Fund | 1,444 | 1,571 | 1,571 | 0 | 0.0% |
| Other Related Expenses | 773 | 133 | 133 | 0 | 0.0% |
| Support Services | 10,587 | 12,784 | 18,924 | +6,140 | +48.0% |
| Total, Headquarters | 19,600 | 21,954 | 29,488 | +7,534 | +34.3% |
| FTEs | 68 | 58 | 60 | +2 | +3.4% |
| Nevada (YMSCO) | | | | | |
| Salaries and Benefits | 13,695 | 15,701 | 18,994 | +3,293 | +21.0% |
| Travel | 500 | 500 | 567 | +67 | +13.4% |
| Other Related Expenses | 2,000 | 4,367 | 4,367 | 0 | 0.0% |
| Support Services | 18,113 | 18,603 | 18,603 | 0 | 0.0% |
| Total, YMSCO | 34,308 | 39,171 | 42,531 | +3,360 | +8.6% |
| FTEs | 90 | 132 | 133 | +1 | +0.8% |
| Program Direction | | | | | |
| Salaries and Benefits | 22,232 | 24,764 | 30,705 | +5,941 | +24.0% |
| Travel | 767 | 767 | 867 | +100 | +13.0% |
| Other Related Expenses | 2,773 | 4,500 | 4,500 | 0 | 0.0% |
| Working Capital Fund | 1,444 | 1,571 | 1,571 | 0 | 0.0% |
| Support Services | 28,700 | 31,387 | 37,527 | +6,140 | +19.6% |
| Total, Program Direction | 55,916 | 62,989 | 75,170 | +12,181 | +19.3% |
| FTEs | 181 | 211 | 215 | +4 | +1.9% |

[a] On December 20, 2002, the National Nuclear Security Administration (NNSA) disestablished the Albuquerque, Oakland, and Nevada Operations Offices, renamed existing area offices as site offices, established a new Nevada Site Office, and established a single NNSA Service Center to be located in Albuquerque. Other aspects of the NNSA organizational changes will be phased in and consolidation of the Service Center in Albuquerque will be completed by September 30, 2004._ For budget display purposes, DOE is displaying non-NNSA budgets by site in the traditional pre-NNSA organizational format.

# Detailed Program Justification

| | (dollars in thousands) | | |
|---|---|---|---|
| | FY 2002 | FY 2003 | FY 2004 |
| **Program Direction** | **55,916** | **62,989** | **75,170** |
| ■ **Salaries and Benefits** | 22,232 | 24,764 | 30,705 |

Funds salaries, awards, lump sum leave payments, benefits and buyout compensation for full-time permanent and other than full-time permanent employees. The FY 2003 funding level provides for 211 FTEs, which is 11 more than in FY 2002.

| | | | |
|---|---|---|---|
| ■ **Travel** | 767 | 767 | 867 |

Includes all costs of transportation of persons, subsistence of travelers, and incidental travel expenses in accordance with Federal travel regulations which are directly chargeable to OCRWM.

| | | | |
|---|---|---|---|
| ■ **Other Related Expenses** | 2,773 | 4,500 | 4,500 |

Includes funding for building maintenance, Yucca Mountain rents, communications, utilities, computer/video support, training, printing and graphics, photocopying, postage, supplies and common administrative services.

| | | | |
|---|---|---|---|
| ■ **Working Capital Fund** | 1,444 | 1,571 | 1,571 |

Includes funding for headquarters building maintenance, rents, communications, utilities, computer/video support, printing and graphics, photocopying, postage, supplies and common administrative services.

| | | | |
|---|---|---|---|
| ■ **Support Services** | 28,700 | 31,387 | 37,527 |

Includes all costs which are defined as advisory and assistance services acquired by contract from non-governmental services to support or improve the OCRWM organization. This element provides support for the following activities: developing the Environmental Impact Statement Mitigation Action Plan, developing and making available NEPA documentation, complying with NRC requirements, developing and maintaining the Quality Assurance Requirements and Description, developing Quality Assurance procedures, and conducting audits, surveillance, and reviews of M&O and other participant activities. Support services also provide an independent technical review capability of the work accomplished by the DOE National Laboratories and the management and operations contractor. In addition, funds are provided for the operation and management of the communications network and computer facilities.

## Explanation of Funding Changes

| | FY 2004vs. FY 2003 ($000) |
|---|---|
| **Salaries and Benefits** | +5,941 |
| The increase in salaries and benefits is due to the OMB requirement to include the CSRS retirement benefit cost, escalation rate, general pay increases, promotions, lump-sum payments, awards, and within-grade increases, and an additional four FTEs to support activities related to the licensing application. | |
| **Travel** | +100 |
| The increase in travel is related to the licensing application process. | |
| **Support Services** | +6,140 |
| The Nevada Transportation support services effort was transferred from the Yucca Mountain Site to Waste Acceptance, Storage and Transportation in FY 2004. The increase is due to additional management and technical support for transportation-related activities as the Program moves toward a license application. | |
| **Total Funding Change, Program Direction** | +12,181 |

# Support Services

| | FY 2002 | FY 2003 | FY 2004 | $ Change | % Change |
|---|---|---|---|---|---|
| | ( dollars in thousands ) | | | | |
| Headquarters Support Services | | | | | |
| Technical Support Services | | | | | |
| Nevada Transportation | 0 | 0 | 6,000 | +6,000 | n/a |
| Technical Support Services (Booz-Allen Hamilton) . | 1,801 | 2,650 | 2,450 | -200 | -7.5% |
| Technical Analysis (EIA) . . . . . | 270 | 450 | 270 | -180 | -40.0% |
| Subtotal, Technical Support Services . . . . . | 2,071 | 3,100 | 8,720 | +5,620 | +181.3% |
| Management Support Services | | | | | |
| ADP / RSIS East . . . . . | 3,847 | 4,497 | 4,497 | 0 | 0.0% |
| HR: Audits, Education, Information & QAMA | 687 | 687 | 707 | +20 | +2.9% |
| Subtotal, Management Support Services . . . . . | 4,534 | 5,184 | 5,204 | +20 | +0.4% |
| Total, Headquarters Support Services . . . . . | 6,605 | 8,284 | 13,924 | +5,640 | +68.1% |
| Quality Assurance Support Services | | | | | |
| Quality Assurance (NAVARRO) . . . . . | 3,982 | 4,500 | 5,000 | +500 | +11.1% |
| Quality Assurance Mgmt Assessment (QAMA) . | 0 | 0 | 0 | 0 | 0.0% |
| Total, Quality Assurance Support Services . . . . . | 3,982 | 4,500 | 5,000 | +500 | +11.1% |
| YMSCO Support Services | | | | | |
| Technical Support Services | | | | | |
| Project Management (Booz-Allen Hamilton) . . . . . | 10,494 | 13,275 | 13,275 | 0 | 0.0% |
| ADP / RSIS West . . . . . | 3,415 | 3,865 | 3,865 | 0 | 0.0% |
| Environmental Impact Statement (EIS) . . . . . | 2,941 | 0 | 0 | 0 | 0.0% |
| Subtotal, Technical Support Services . . . . . | 16,850 | 17,140 | 17,140 | 0 | 0.0% |
| Management Support Services | | | | | |
| Administrative Support (ALPHA Services) . . . . . | 1,263 | 1,463 | 1,463 | 0 | 0.0% |
| Subtotal, Management Support Services . . . . . | 1,263 | 1,463 | 1,463 | 0 | 0.0% |
| Total, YMSCO Support Services . . . . . | 18,113 | 18,603 | 18,603 | 0 | 0.0% |
| Total, Support Services . . . . . | 28,700 | 31,387 | 37,527 | +6,140 | +19.6% |