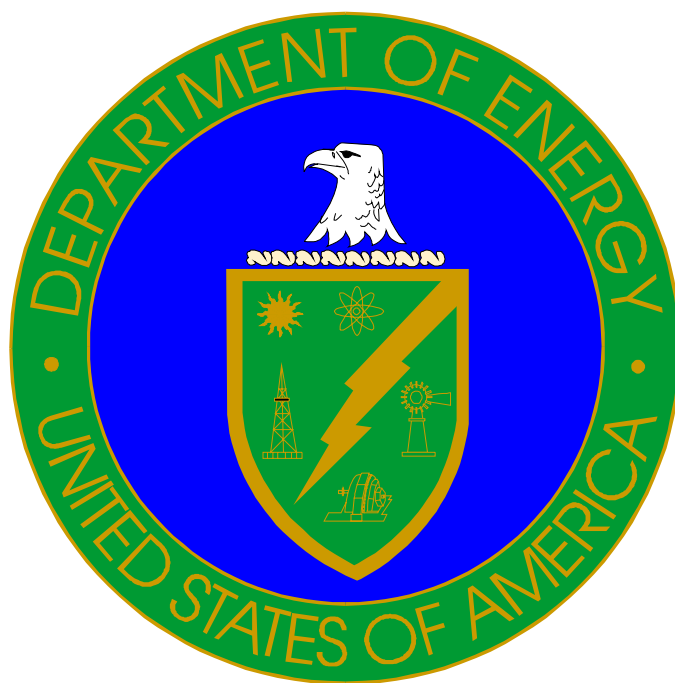

**OFFICE OF CIVILIAN
RADIOACTIVE WASTE MANAGEMENT
PROGRAM BUSINESS PLAN**



AUGUST 18, 1999

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
1.0	INTRODUCTION	1
1.1	Purpose	1
1.2	Historical Perspective	2
1.3	Geologic Disposal	2
1.4	Laws and Regulations	2
1.5	Location	3
1.6	Facility Overview	5
2.0	PROGRAM FUTURE PLANS	10
2.1	Potential Statements of Work	10
2.1.1	Major Contracted Activities	12
2.1.1.1	Design/Licensing	15
2.1.1.2	Construction	17
2.1.1.3	Transportation	18
2.1.1.4	Operations	20
2.1.2	Support	21
2.1.2.1	Management and Technical Support	22
2.1.2.2	National Environmental Policy Act Support	23
2.1.2.3	Quality Assurance Support	23
2.1.2.4	Quality Assurance Management Assessment	24
2.1.2.5	Information Technology	24
2.1.2.6	Administrative Support	25
2.1.2.7	Financial Auditing Support	25
2.1.2.8	Support Costs	26
2.1.3	Financial Assistance	27
2.1.3.1	Cooperative Agreements	27
2.1.3.2	Section 180(c) Grants	27
2.1.3.3	Financial Assistance Costs	28
2.2	Program Cost	28
3.0	ACCOMPLISHMENTS AND FUTURE MILESTONES	32
4.0	CONTRACT METHODOLOGY	35
4.1	Contract Approach	35
4.2	Statements for Consideration	37
4.2.1	Design	37
4.2.2	Contract Characteristics	38
4.2.3	Mix of Contractors	38
4.2.4	Contract Philosophy	38
4.2.5	Site Support and Security Services	39
4.2.6	Construction Manager	39
4.2.7	Major Decisions	39
4.2.8	Contracting/Subcontracting/Privatization Opportunities	40

TABLE OF CONTENTS (CONTINUED)

<u>Section</u>		<u>Page</u>
5.0	CONCLUSIONS	41
6.0	SCHEDULES	42
7.0	REFERENCES	47

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1-1	Location of Commercial and DOE Sites and Yucca Mountain	4
1-2	Proposed Surface and Underground Facilities at Yucca Mountain	7
1-3	Program Phases	9
2-1	Potential Major Contract Periods of Performance	11
3-1	Program Accomplishments	34

LIST OF TABLES

<u>Table</u>		<u>Page</u>
2-1	Major Cost Centers for Contract Acquisition	15
2-2	Support Costs	26
2-3	Financial Assistance	28
2-4	Program Cost History (Nuclear Waste Fund and Defense Appropriations	29
2-5	1998 Total System Life Cycle Cost Estimate Summary	30
2-6	Comparison of the Viability Assessment Cost Estimate With the Total System Life Cycle Cost Estimate	31

1.0 INTRODUCTION

1.1 PURPOSE

The Office of Civilian Radioactive Waste Management (OCRWM) Program Business Plan has been developed to document the overall business and contracts strategy for OCRWM. Revision 2 of the OCRWM Program Plan [Reference 1] documents the Program's mission, vision, strategic objectives, strategies, and success measures, and provides a description of Program activities and milestones through Fiscal Year 2003. The Viability Assessment identifies assumptions, task descriptions, schedules, and cost estimates associated with implementing the OCRWM Program for the Yucca Mountain Site Characterization Project from Fiscal Year 2002 through Fiscal Year 2010. The concepts and strategies discussed in this plan are predicated on receiving funding, necessary approvals, and other factors set forth in the Viability Assessment. Major milestones and information in the Viability Assessment that are contingent on the Yucca Mountain site being recommended to and approved for development by the President and Congress include:

- Submittal of a License Application in Fiscal Year 2002.
- Continued progress with a Construction Authorization planned for Fiscal Year 2005.
- Submittal of an updated License Application in March 2008.
- Receipt of a license to receive and possess waste with initial waste emplacement occurring in Fiscal Year 2010.
- Distribution of annual estimated costs.

Due to the long-term nature of this Program, the OCRWM Program Business Plan is a living document that sets forth the planning and informational bases for future business and contract strategies for the OCRWM Program from the present through the Repository Operations and Emplacement Phase to Closure and Decommissioning. As currently structured, the OCRWM Program Business Plan provides historical information, references to other relevant Program documents, and discussions of activities and processes that will be developed further. The near-term focus is on the integration of site data, repository design, and performance assessment to support a decision on the suitability of the Yucca Mountain site and afterward licensing that site if a decision is made to proceed with development. Changes and updates will continue, as necessary, throughout the life of the OCRWM Program as new technologies and procurement methods evolve. Moreover, it is likely that experience gained in working the first phase—namely, design and licensing—may affect how Department of Energy (DOE) chooses to proceed in subsequent contract awards for construction and operations.

The OCRWM Program Business Plan includes the Program's business and contracting strategy for the Yucca Mountain Site Characterization Project; the Acceptance, Transportation, and Integration Project; and the OCRWM Program Management Center.

1.2 HISTORICAL PERSPECTIVE

The Nuclear Waste Policy Act of 1982, as amended (NWPA), established OCRWM within the DOE and assigned to OCRWM the responsibility to develop, construct, and operate a system for spent nuclear fuel and high-level radioactive waste disposal, including a permanent geologic repository, interim storage capability, and transportation system.

OCRWM is headquartered in Washington, D.C. Its Director reports to the Secretary of Energy through the Deputy Secretary. OCRWM carries out its mission through two project-level business centers—the Yucca Mountain Site Characterization Project in Las Vegas, Nevada, and the Acceptance, Transportation, and Integration Project at OCRWM Headquarters (previously referred to as the Waste Acceptance, Storage, and Transportation Project)—and the Program Management Center at OCRWM Headquarters.

DOE has been studying a site at Yucca Mountain, Nevada, for more than 15 years to determine whether it is a suitable location to build a geologic repository for the nation's spent nuclear fuel and high-level radioactive waste. In addition, the Office of Acceptance, Transportation, and Integration has been addressing issues related to and including acceptance and transportation of spent nuclear fuel and high-level radioactive waste for eventual emplacement in a repository. Acceptance, Transportation, and Integration activities focus on the development of processes for the legal and physical transfer of commercial spent nuclear fuel to the federal government, creation of a national transportation capability for waste acceptance and transportation, and resolution of institutional issues with OCRWM Program stakeholders. The Office of Acceptance, Transportation, and Integration also coordinates with a broad network of state, tribal, and local government officials; industry representatives; utility organizations; technical experts; and private citizens who have an interest in how DOE will transport spent nuclear fuel and high-level radioactive waste [Reference 1, pages 38–40].

1.3 GEOLOGIC DISPOSAL

Geologic disposal of radioactive waste has been the focus of scientific research for more than 40 years. As early as 1957, a National Academy of Sciences report to the Atomic Energy Commission recommended burying radioactive waste in geologic formations. In 1962, the Atomic Energy Commission began investigating salt formations—including bedded salt and salt domes—as potential host rocks for repositories. In 1975, the Energy Research and Development Administration, one of the predecessors to DOE, selected a site near Carlsbad, New Mexico, for the disposal of transuranic waste as part of the Waste Isolation Pilot Project. In 1976, the Energy Research and Development Administration began investigating other geologic formations and considering different disposal concepts, including deep-seabed disposal, disposal in the polar ice sheets, and rocketing waste into the sun. In 1981, after an extensive evaluation of the options, DOE concluded that disposal in a geologic repository was still the preferred option.

1.4 LAWS AND REGULATIONS

The NWPA directed DOE to develop a system for safe and permanent disposal of spent nuclear fuel and high-level radioactive waste. Congress and the President decided that the generation who received the economic benefits of nuclear power and national security benefits of nuclear

weapons had an obligation to bear the political and financial costs of developing the management options for these materials [Reference 2, page 6].

To meet that obligation, the NWSA set an ambitious schedule for DOE to site two geologic repositories and begin accepting waste for disposal in the first repository by January 31, 1998. DOE formally identified nine potentially acceptable sites across the nation and later narrowed the list to three promising sites—Deaf Smith County, Texas; Hanford, Washington; and Yucca Mountain, Nevada. In 1987, the NWSA was amended to direct DOE to concentrate its studies on only the Yucca Mountain site to determine its suitability for development as a repository. This legislation, known as the Nuclear Waste Policy Amendments Act of 1987, also established the Nuclear Waste Technical Review Board, which is composed of experts appointed by the President to review and comment on the Yucca Mountain Site Characterization Project.

Beyond reaffirming the federal government's responsibility for developing repositories for the permanent disposal of spent nuclear fuel and high-level radioactive waste, the NWSA also affirmed the responsibility of the waste generators (e.g., nuclear utilities, federal defense nuclear program) to pay for that effort. The NWSA requires utilities with nuclear power plants to pay a fee to help fund the disposal program. The federal government bears the disposal costs for defense waste.

The NWSA also assigns distinct roles to the Environmental Protection Agency and the Nuclear Regulatory Commission. The NWSA directs the Environmental Protection Agency to establish standards for protecting the general environment against the release of radioactive material from a repository. The Nuclear Regulatory Commission is responsible for establishing technical requirements and criteria, consistent with the Environmental Protection Agency standards, for approving or disapproving applications to construct, operate, and eventually close a repository. In 1981 and 1983, the Nuclear Regulatory Commission issued regulations for a geologic repository in anticipation of the Environmental Protection Agency standards.

Subsequently, the Energy Policy Act of 1992 created a new process for setting environmental standards for the Yucca Mountain repository. The Energy Policy Act directs the National Academy of Sciences to provide findings and recommendations on reasonable standards for the protection of the public health and safety. It also directs the Environmental Protection Agency to issue public health and safety standards for the Yucca Mountain site based on, and consistent with, the National Academy of Sciences' findings and recommendations. Once this has been accomplished, the Nuclear Regulatory Commission will revise its technical requirements and criteria, as necessary, to be consistent with the new Environmental Protection Agency standards. The National Academy of Sciences issued its report in 1995, and the Environmental Protection Agency currently is developing its standards [Reference 2, page 8].

1.5 LOCATION

The OCRWM Program continues to focus on core activities that will precede acceptance and transportation of spent nuclear fuel from reactor sites to a federal facility, such as a potential geologic repository at Yucca Mountain [Reference 1, pages 39–40]. Currently, spent nuclear fuel and high-level radioactive waste are being stored temporarily at 77 locations in 35 states (Figure 1-1). Some of these storage sites are close to population centers and/or are located near

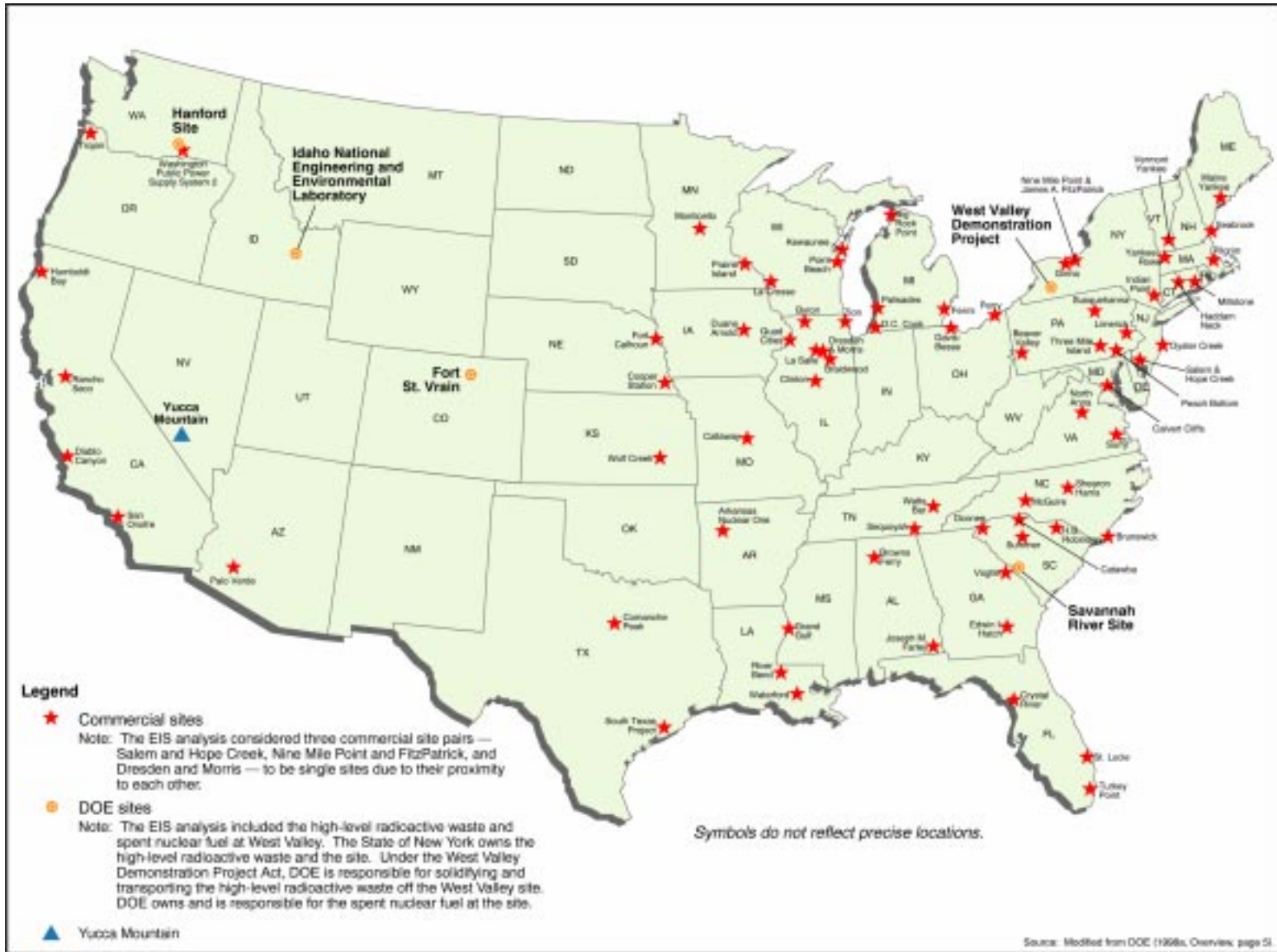


Figure 1-1. Location of Commercial and DOE Sites and Yucca Mountain

ivers, lakes, and seacoasts. If left in their current locations for an indefinite period of time, the stored materials could become a hazard to nearby populations and the environment [Reference 2, page 5]. Although the OCRWM Program has altered its priorities over the years in response to direction from Congress and the President, transportation issues have remained relatively consistent. DOE will develop transportation plans and operation strategies, along with state, tribal, and local preparedness organizations. Safe routine transportation and emergency response activities are an integral part of the OCRWM Program.

The potential geologic repository is located approximately 100 miles northwest of Las Vegas, Nevada, away from the population centers. It borders the edge of the nation's nuclear weapons test site, where more than 900 nuclear tests have been conducted. This unpopulated land is owned by the federal government [Reference 2, page 10].

1.6 FACILITY OVERVIEW

If the site is determined to be suitable and subsequently licensed, spent nuclear fuel and high-level radioactive waste will be transported to Yucca Mountain by truck and/or rail in specially designed, shielded shipping containers that have been approved by the Nuclear Regulatory Commission. When it arrives at Yucca Mountain, the waste will be removed from the shipping casks and placed in sealed, long-lived waste packages for underground disposal; carried into the underground repository by rail; placed on supports in the tunnels; and monitored during the preclosure period. The repository system will be capable of handling the following types of waste:

- Commercial spent nuclear fuel assemblies.
- Commercial spent nuclear fuel in disposable canisters.
- Commercial nuclear fuel in nondisposable canisters.
- DOE and Navy spent nuclear fuel in disposable canisters.
- DOE spent nuclear fuel in nondisposable canisters (on a case-by-case basis).
- Commercial and defense high-level waste in disposable canisters.

The repository facilities will be designed to implement the following functions:

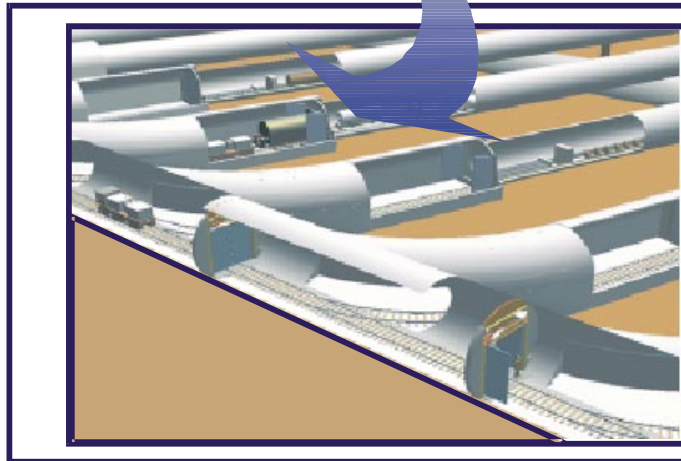
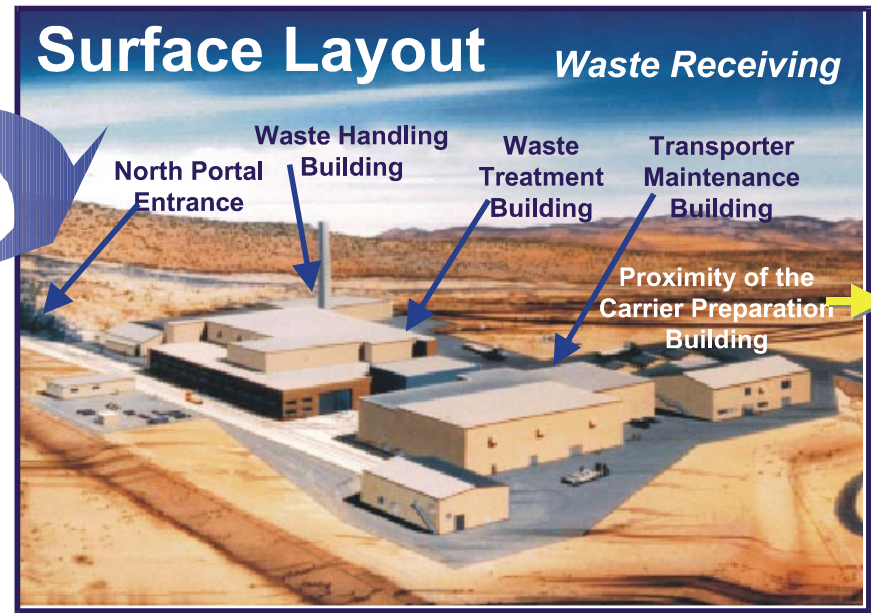
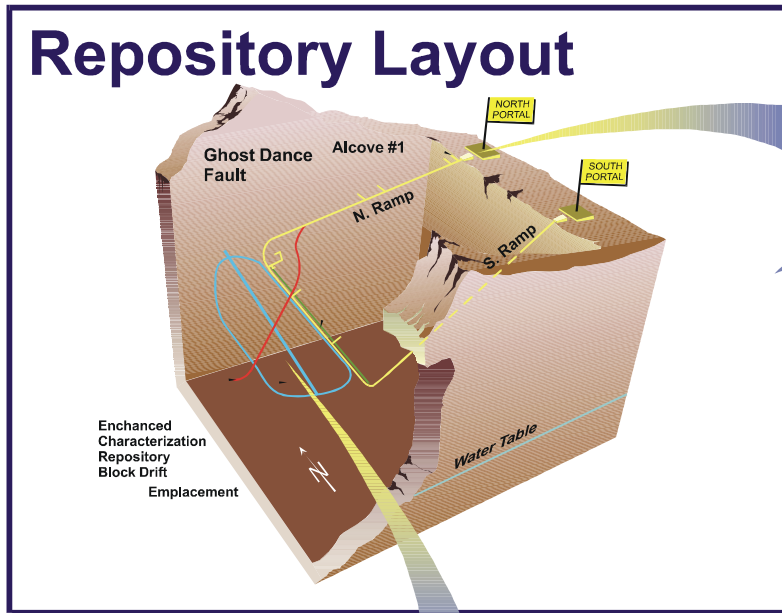
- Receipt and preparation for disposal of the previously mentioned waste types.
- Repository transport/transfer.
- Underground excavation and construction.
- Waste emplacement and retrieval.
- Waste monitoring.

- Tunnel ventilation.
- Radioactive exposure/contamination control.
- Security operations and safeguards.
- Low-level radioactive and other nondisposable waste collection and transport for off-site disposal.
- Final closure and decommissioning.

In addition to the specific functions identified above, the repository facilities will provide for:

- Fire protection.
- Offices and administration areas.
- Mockup and worker training.
- Utilities.
- Material warehousing.
- Maintenance shops and work areas.
- Emergency/dispensary facilities.
- Parking.

The surface facilities (Figure 1-2) will be designed to receive waste and prepare it for final disposal and to support the excavation, construction, loading, and ventilation of the repository tunnels. The surface layout would cover approximately 100 acres. The main area would be located at the North Portal entrance to the underground repository and would contain the necessary facilities and equipment to remove the waste from the shipping casks. The waste would then be placed in Nuclear Regulatory Commission-approved waste packages and loaded on a special rail car for underground transport. This area would consist of a radiologically controlled area and a balance-of-plant area. The radiologically controlled area would consist of the waste handling, waste treatment, carrier preparation, transporter maintenance, and airlock buildings. The balance-of-plant facilities would include warehouses, shops, administration areas, mockup facilities, utilities, medical facilities, a service station, security stations, and a fire station. A second area, located at the South Portal entrance, would accommodate the facilities to support the excavation and construction of underground tunnels. Facilities that house the air intake and exhaust fans for ventilating the tunnels would be located in different areas near the top of Yucca Mountain. Alternative energy sources such as wind or solar could provide power for the surface facilities and repository systems.



Subsurface Layout

Waste Emplacement

To accommodate 70,000 metric tons, the proposed repository will include approximately 100 emplacement tunnels (73 miles of tunnels), each up to 0.62 miles in length; approximately 100 waste packages will be emplaced in each tunnel.

Figure 1-2. Proposed Surface and Underground Facilities at Yucca Mountain

The subsurface facilities (Figure 1-2) would consist of approximately 100 miles of tunnels. The main tunnels are designed for moving people, equipment, and waste packages. The ventilation tunnels are designed for circulating air to the workers and maintaining required temperatures in the repository. The emplacement drifts would accommodate the waste packages. Two gently sloping access ramps, along with the vertical ventilation shafts, would connect the underground and surface areas [Reference 2, page 14].

Due to the complex nature of siting, developing, and licensing a repository, the design for the facilities could change significantly as new technical advancements, cost-effective solutions, and/or new requirements are identified. The repository design is flexible and can evolve to take advantage of future advances and technologies that may become available.

The time envisioned to complete the waste disposal program ranges from the present through 2116. During this time, the Program will evolve through several distinct phases, as shown in Figure 1-3. The phases depicted in Figure 1-3 reflect emplacement of all planned waste to include all commercial spent nuclear fuel. With this consideration, the phases are slightly different than those depicted and referenced in Volume 5 of the Viability Assessment [Reference 4]. The phases of the OCRWM Program, as described in the Total System Life Cycle Cost [Reference 5], are:

- Site Characterization, Development, and Evaluation (Present–2002).
- Licensing (2002–2005).
- Construction (2005–2009).
- Mobilization and Acquisition (2005–2010).
- Waste Acceptance and Transportation (2010–2041).
- Repository Operations and Emplacement (2010–2041).
- Monitoring (2041–2110).
- Closure and Decommissioning (2110–2116).

These phases may or may not correspond to the potential contract periods of performance. The contract periods of performance are discussed in Section 2.0 and depicted graphically in Figure 2-1. Schedules for the potential contract periods of performance are presented in Section 6.0. The need for pre- and post-phase planning and closeout activities may require the contract periods of performance to begin prior to the start of an actual Program phase or extend past completion of the Program phase.

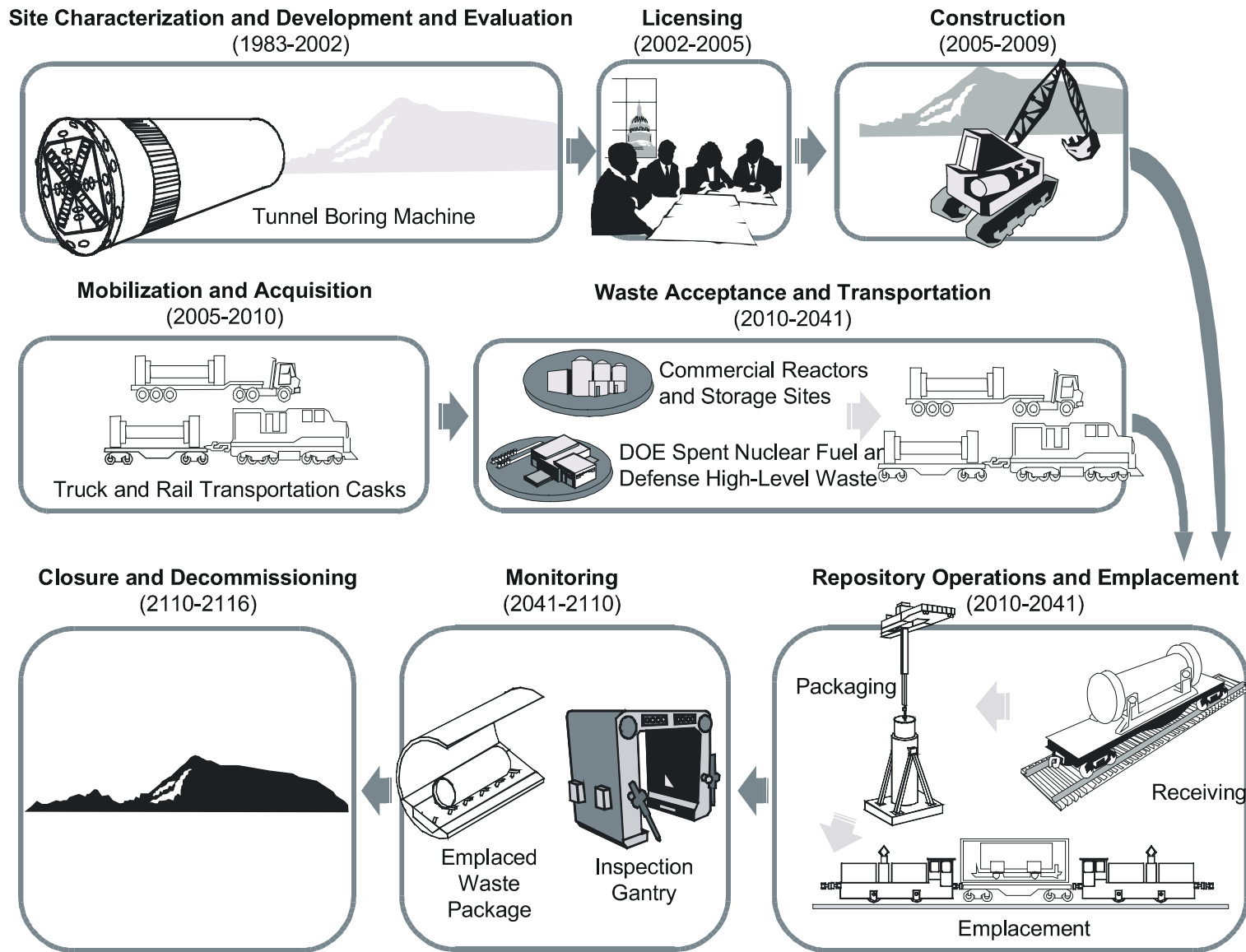


Figure 1-3. Program Phases

2.0 PROGRAM FUTURE PLANS

The OCRWM Program Business Plan provides brief statements of work and an estimate of costs for various contracted activities. It is anticipated that the OCRWM Program will have four primary and distinct contract activities during the next decade (through 2010)—design and licensing, construction, transportation, and repository operations. These contract activity segments correlate roughly to the first six phases of the OCRWM Program, as listed in Section 1.6. Various functional activities will require support from independent contractors and financial assistance agreements with state and local governments and Indian tribes for training and emergency preparedness. However, maintenance and continued implementation of the standard contracts that DOE has executed with individual owners and generators of spent nuclear fuel and/or high-level radioactive waste (10 Code of Federal Regulations [CFR] Part 961) are not included in the OCRWM Program Business Plan. The OCRWM Program Business Plan focuses on summary statements of work and discussions of the contracting opportunities anticipated during the next 10 to 12 years.

2.1 POTENTIAL STATEMENTS OF WORK

The following sections provide discussions about the current and future work necessary to proceed with the disposal of spent nuclear fuel and high-level waste. Additional discussions of work and cost information can be found in the Waste Acceptance, Storage, and Transportation section of the OCRWM Program Plan, Revision 2 [Reference 1, pages 37–44) and in Volumes 4 and 5 of the Viability Assessment [References 3 and 4]. Schedules for key activity milestones are presented in Section 6.0 of this OCRWM Program Business Plan.

Innovative concepts, such as those presented in the Clinger-Cohen Act, Government Performance and Results Act, Government Management Reform Act, Federal Acquisition Streamlining Act, contract reform initiatives, performance-based incentive fee contracting methods, commercial and industry contracting practices, and government and commercial initiatives, have been considered in the development of this Program Business Plan. Several of the activities discussed below may be appropriate for firm-fixed pricing, cost incentives, performance-based incentives, or any combination of the preceding and other acquisition concepts. However, the contracting method will be selected after an assessment and qualification of project uncertainties. For each contracting method that is selected, the contractor will use adequate project controls that suit the nature of the contract and reflect good business practices.

As stated previously, the OCRWM Program phases may or may not correspond to the potential contract periods of performance. The need for pre- and post-phase planning and closeout activities may require contract periods of performance to begin prior to the start of an actual Program phase or extend past completion of the Program phase. Additionally, some specific tasks may be repeated in the major contract sections and may subsequently shift between major contract statements of work based on development of detailed acquisition strategy documents. The contract periods of performance are depicted graphically in Figure 2-1. Schedules for the potential contract periods of performance are presented in Section 6.0.

Potential Major Contract Periods of Performance

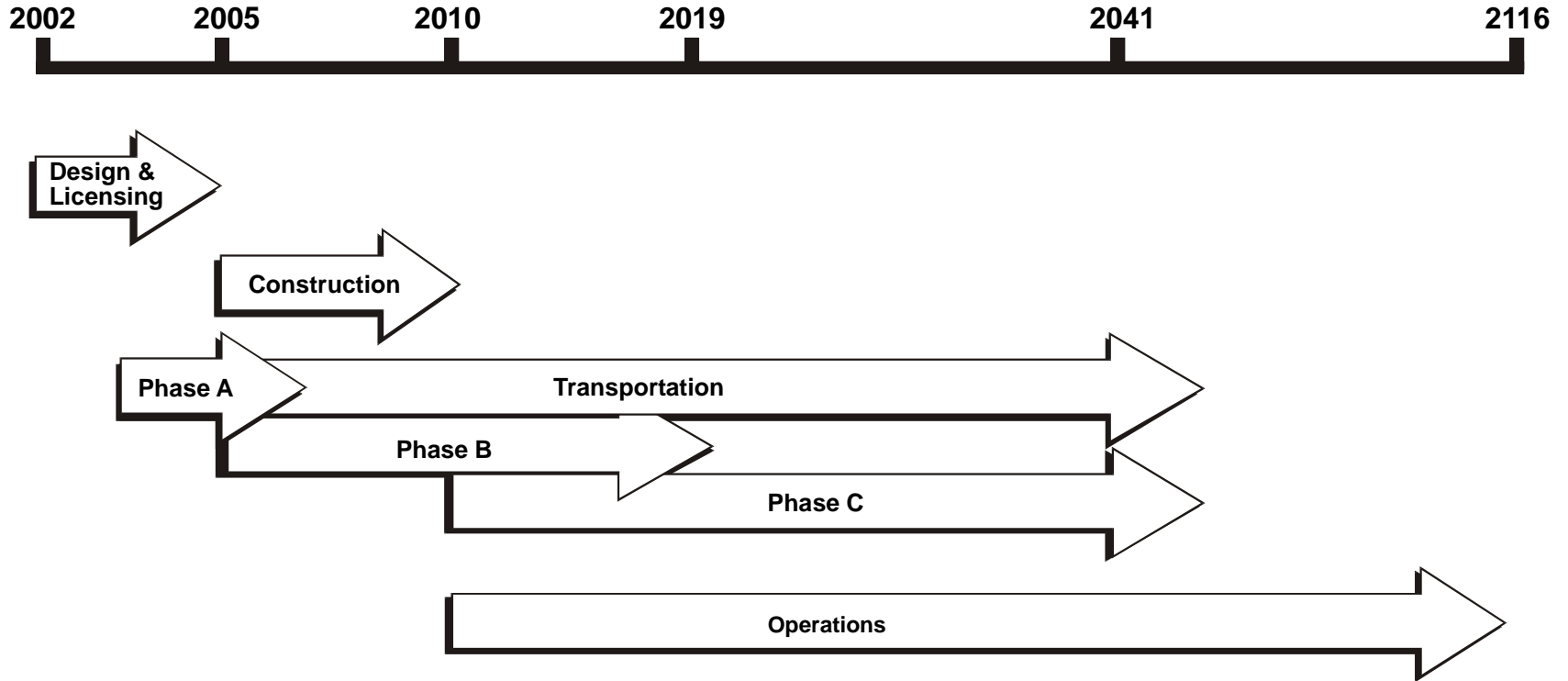


Figure 2-1. Potential Major Contract Periods of Performance

2.1.1 Major Contracted Activities

The following sections discuss the four major contracting activities anticipated for the OCRWM Program in the near term. The period of performance in total extends from as early as Fiscal Year 2000 through Fiscal Year 2116, with the eventual closure and decommissioning of the repository. During this period, it is anticipated that contracts will be recompleted periodically and contractors will change over time. Also, it should be noted that the division of duties discussed in the following sections represents flexible rather than rigid demarcations. That is, the actual statements of work for individual contracts may vary.

The current contract arrangement for conducting the characterization of the Yucca Mountain Site is a management and operating contract with a combination performance-based award fee evaluation mechanism. There is a single prime contract with multiple major subcontracts working together under various partnership and subcontract arrangements. Support from the USGS and the National Laboratories is provided directly to the prime contractor under various interagency agreements and integrated contractor orders held by DOE. The contract was awarded with a base period and options. Significant work activities include the following:

- **Core Science**—The Core Science activities focus on investigating the geologic conditions of the Yucca Mountain site and determining the ability of Yucca Mountain to act as a natural barrier to radionuclide release into the environment. Core Science activities include collecting and testing geologic, hydrologic, geochemical, and geomechanical site characterization and performance confirmation data from the subsurface and surface. The ongoing collection of data through FY 2001 will include data from short- and long-term testing programs (both on the surface and underground) that produce quality field and laboratory measurements for use in conceptual and numerical process models and engineering design calculations. These data will provide an increased understanding of the hydrology, geology, and geochemistry of the site and supply information on how thermal, hydrologic, chemical, and mechanical processes behave in the immediate natural environment. The purpose of these data is to reduce uncertainties associated with how the natural barriers will perform with engineered systems over thousands of years. Other Core Science activities include collecting and monitoring environmental data to ensure compliance with regulatory requirements; testing material performance; planning, formulating, modeling, and testing scientific hypotheses; completing models and reports; and collaborating with the international scientific community, including Russian scientists and engineers, on characterization issues of mutual interest.
- **Design and Engineering**—Design and Engineering activities focus on developing and refining the preliminary repository and waste package designs and will become more detailed as continuing science and modeling activities further refine the design characteristics of the repository. A quality assurance verification of the design to be used in the Total System Performance Assessment for both a decision on Site Recommendation and later a License Application will be completed. In addition, several key design alternatives will be evaluated, as proposed in the Viability Assessment, Volume 2. Alternative designs are being evaluated to reduce the uncertainties regarding the performance of the repository over thousands of years. These alternatives include continuous ventilation of the wastes, both pre- and post-closure; alternative waste package designs and materials (depending on the waste type);

lower thermal loads in the underground emplacement drifts; self-shielded waste package designs that eliminate most underground remote handling operations; and different waste package emplacement configurations (in-drift, in-floor emplacement). Value engineering will be used to determine and maintain essential functions at the lowest life-cycle cost consistent with the required levels of performance, reliability, availability, quality and safety, and security.

The design to support the Site Recommendation Report and License Application will be selected and documented. These documents will include safety and accident analyses and will describe the design in sufficient detail to show whether the repository may be operated safely during waste emplacement in Yucca Mountain and after all waste packages have been emplaced (i.e., postclosure period).

Important areas of ongoing design emphasis include waste package materials; waste form testing and analyses; waste handling system and emplacement operations; a description of how the Monitored Geologic Repository would operate (i.e., repository concept of operations); a demonstration of design compliance with codes, standards, and regulatory requirements (i.e., design verification); assurance that the technical work being performed within the individual engineering specialties is integrated (i.e., interface control); and detailed engineering for these elements of the repository system that show no similarities to systems licensed previously in commercial nuclear power plants.

- **Suitability/Licensing and Performance Assessment**—The objective of this assessment activity is first to compile the technical documentation that will support the Site Recommendation Report and second, if the Secretary of Energy decides to recommend the Site and the President and Congress approve the recommendation, to complete the License Application and submit it to the Nuclear Regulatory Commission. A Site Recommendation Consideration Report will be developed to provide the technical bases required under the Nuclear Waste Policy Act of 1982, as amended, as part of the Site Recommendation Report. This report, the final Environmental Impact Statement, and other information required by the Nuclear Waste Policy Act of 1982, as amended, will be considered by the Secretary of Energy in deciding whether to recommend the site to the President.

Complete program records are critical to the preparation of the Environmental Impact Statement, reports supporting a Site Recommendation Report and License Application, and for the Nuclear Regulatory Commission's license review process. All technical data used for the repository design, Total System Performance Assessment, and models for site processes and conditions must be traceable and electronically retrievable in accordance with 10 CFR 960 Part 2, Subpart J. The latest web-based technologies will be utilized to ensure that program data and records are quickly and easily retrievable at the time that the Secretary of Energy decides whether to recommend the site to the President.

- **National Environmental Policy Act**—This activity entails amassing the environmental data that will form the basis of the 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 Nuclear Waste Policy Act of 1982, as amended, requires that an Environmental Impact Statement be included in a Site Recommendation Report and that the Nuclear Regulatory Commission, in granting repository construction authorization, adopt the

DOE's Environmental Impact Statement to the extent practicable. The draft Environmental Impact Statement will be completed and issued for public review and comment. The final Environmental Impact Statement will evaluate potential environmental impacts associated with building, operating, and eventually closing a repository at Yucca Mountain. Data to support the Environmental Impact Statement will be generated by Core Science, Design and Engineering, and Suitability/Licensing and Performance activities.

- **Operations/Construction**—Operations/Construction activities include providing, maintaining, and managing the operating systems, structures, and construction necessary to support the Yucca Mountain site characterization effort. Operations activities include maintaining facilities and systems constructed to gather site characterization data; maintaining facilities in the central support area at the site; providing and maintaining site utilities and communications; and providing transportation for site workers. Construction activities include constructing and modifying test areas; changing the configuration of the Exploratory Studies Facility (ESF) to provide a fully functional underground scientific research facility; and providing direct support for test setup and execution. Scientific and technical support facilities constructed to support testing include the Exploratory Studies Facility, Busted Butte Facility, Fran Ridge Facility, and various surface test drilling sites (boreholes). The ESF which is the cornerstone of the underground characterization effort, includes the 5-mile Main Loop, 1.7-mile Cross Drift, and 11 large test areas. These test areas provide access for the collection of observational and confirmatory data to support the data in the Viability Assessment and for the Site Recommendation Report. The Central Support Area, originally constructed in the late 60s and early 70s, consists of existing buildings, roads, utilities, and communication systems that have been rehabilitated and are maintained to provide the necessary base of operations.

- **Project Management**—Project Management provides support to technical and scientific programs allowing for the planning, funding, managing, measuring, and processing of data. Most importantly, project management activities will support program goals to complete the Site Recommendation Report; a decision whether to recommend the Site and submit a License Application (if the Site is determined to be suitable). Project Management will provide the systems and processes necessary to conduct institutional, scientific, and technical activities. Specific project management activities include: an Earned Value Management System that involves planning, scheduling, and measuring performance for all of the Yucca Mountain Site Characterization Project elements, as well as information technology and telecommunications management; leases; office services, training, security, and procurement; facilities management and motor pool operations; records management; and technical document control. Project management also includes conducting public information and outreach programs to ensure that open and informative interactions with the public and program stakeholders are continued.

Table 2-1 presents the estimated annual program costs for the major business and management centers from Fiscal Year 2000 through Fiscal Year 2010. These costs are presented in a functional manner (i.e., Monitored Geologic Repository; Acceptance, Transportation, and Integration; and Program Management Center) as opposed to a format that matches the major contract activity summaries. Further discussion of these costs can be found in the Analysis of

the Total System Life Cycle Cost of the Civilian Radioactive Waste Management Program [Reference 5].

Table 2-1. Major Cost Centers for Contract Activity^{1, 4}
(in millions of 1998 dollars)

Year	MGR	ATI ²	PMC ³	Total
2000	312	6	92	410
2001	284	5	98	387
2002	273	24	99	396
2003	285	47	96	428
2004	312	31	91	434
2005	610	70	100	780
2006	760	250	120	1,130
2007	620	130	120	870
2008	590	170	140	900
2009	360	160	140	660
2010	370	160	140	670
Total	4,776	1,053	1,236	7,065

- ¹ Adapted from the Analysis of the Total System Life Cycle Cost of the Civilian Radioactive Waste Management Program [Reference 5].
- ² The Acceptance, Transportation, and Integration total includes the State of Nevada transportation costs.
- ³ The Program Management Center column combines program integration and institutional costs.
- ⁴ These cost estimates reflect DOE's best estimates, given the scope of the work identified and planned schedule of required activities. Future budget requests for the program have yet to be established, and, in any event, will be determined through the annual executive and congressional budget process.

ATI = Acceptance, Transportation, and Integration
MGR = Monitored Geologic Repository
PMC = Program Management Center

2.1.1.1 Design/Licensing

The licensing phase will focus on the integration of site data, facility design, and repository performance and is expected to begin in March 2002 and run through completion of action on the Nuclear Regulatory Commission Construction Authorization expected in 2005. However, it is anticipated that the design/licensing-contracted activities may start 12 to 18 months prior to this phase and may extend through completion of construction. Although a significant amount of design work will occur prior to 2002, final designs in support of Construction Authorization will be completed during this phase. Vast amounts of data have been collected at the Yucca Mountain site over the past 15 years. Four national laboratories (i.e., Los Alamos National Laboratory, Sandia National Laboratory, Lawrence Livermore National Laboratory, and Lawrence Berkeley National Laboratory) and the U.S. Geological Survey, all under contract to DOE, have collected the majority of the data. Preliminary designs for the surface facilities, underground repository openings, and waste packages have been developed largely by the current management and operating contractor. In addition, numerous iterations of the Total

System Performance Assessment have been performed, earlier by Sandia National Laboratory and more recently by the current management and operating contractor. Data are collected, analyses are performed, and designs are developed in accordance with the Nuclear Quality Assurance Program approved by the Nuclear Regulatory Commission. We expect that interactions with the Nuclear Regulatory Commission will increase as the OCRWM Program engages in development of a License Application and precicensing issue resolution process. The following specific activities will constitute much of the scope of this contracted activity:

- **Licensing**—The licensing scope covers a wide range of activities, including developing the License Application; supporting pre-License Application public hearings; supporting licensing hearings; developing, reviewing, and submitting License Application updates, as required by the Nuclear Regulatory Commission; supporting the Nuclear Regulatory Commission’s review of the preoperational test results; and developing technical specifications.
- **Technical Data Management Systems**—License Application design requirements and technical information will be compiled, maintained, and distributed (as necessary) to support the Nuclear Regulatory Commission’s licensing evaluations, License Application updates, procurement, construction design, and performance confirmation activities. It is anticipated that the OCRWM Program will continue to utilize emerging technology to assimilate and maximize management of the Yucca Mountain Site Characterization Project technical data.
- **Total System Performance Assessment**—The Total System Performance Assessment will be further refined after License Application submittal and prior to receipt of the Construction Authorization. The purpose is to reduce uncertainties and incorporate additional data or comments from entities such as the laboratories and Nuclear Waste Technical Review Board. Thorough integration of this information is essential to the success of the License Application submittal and receipt of Construction Authorization.
- **Designs and Specifications**—Final designs for the surface-based waste handling facilities and subsurface facilities (including underground emplacement drifts and waste package containment vessels) will be developed, presented, and defended during the course of this contracted activity. Integration of the designs with the results of the natural system testing programs and Total System Performance Assessment iterations will be essential. Much of the design work to date has been performed by the present management and operating contractor.
- **Site, Repository, and Waste Package Testing and Performance Confirmation Monitoring**—Testing programs directed at characterization of the natural environment, collection of data to support repository design, and long-term waste package material testing programs are currently under way. These testing programs must continue and transition to a performance confirmation-oriented program as required by Nuclear Regulatory Commission regulations.

The design and licensing contractor may perform continuous, periodic inspections and construction acceptance as the work progresses, except for turnkey activities where the constructor is a subcontractor to the design/licensing contractor and the designer would be reviewing its own work. In this situation, DOE will procure an independent architect-engineer to conduct such services.

2.1.1.2 Construction

The construction phase is expected to begin in March 2005 and run through February 2010. The construction phase will start after the Nuclear Regulatory Commission authorizes construction; however, it is possible that several construction activities may begin 12 to 18 months prior to the start of the construction phase (i.e., 2003 or 2004). Tasking for construction includes major capital expenditures, subsurface excavation, and surface construction of facilities within the radiologically controlled area and balance-of-plant facilities, and initial waste package fabrication. The underground area will include, at a minimum, sufficient development to begin emplacing waste packages in February 2010. The following specific functional areas will constitute much of the scope of this contracted activity:

- **Surface Facilities**—This task will include the work required to construct four major structures/facilities (i.e., site preparation and transportation, site support systems, waste handling structures, and North Portal entrance support structures). Activities may include preparing the site; constructing all major facilities for receipt, handling, and packaging of waste for emplacement; and constructing sitewide facilities and systems, such as balance-of-plant facilities, roads, and on-site rail, water, sewage, electricity, fuels, fencing, communications, and environmental monitoring systems.
- **Off-Site Power**—This task may include the installation and construction of new electrical transmission lines and power distribution equipment necessary to bring a sufficient electricity supply to the repository area to support construction and future operational phases. Electricity could be supplied by solar or wind power systems that could be available in the near future.
- **Subsurface Facilities**—This task may include the work required to construct all access drifts with appurtenant machine assembly chambers and ventilation barriers, emplacement drifts of a suitable number to begin emplacement in 2010, drift turnouts and ventilation shafts suitable to support the initial emplacement drifts, excavation material handling systems, and South Portal entrance support facilities. This task also includes all management and integration activities associated with the construction operation, including architect-engineering services; configuration control of specifications and drawings; and all functions to organize, coordinate, plan, schedule, direct, and inspect the construction activities.
- **Waste Packages**—This task may include initial fabrication. Disposal efforts will focus on commercial spent nuclear fuel, including boiling water and pressurized water reactor assemblies; defense high-level waste; and DOE spent nuclear fuel, including Navy spent nuclear fuel.
- **Performance Confirmation**—A performance confirmation program is required by Nuclear Regulatory Commission regulations to ensure that the waste packages and subsurface repository function in accordance with the license requirements. This task may include a combination of site, repository, and waste package testing; maintenance of the testing facilities; and evaluation of the Total System Performance Assessment models.

- Regulatory, Infrastructure, and Management Support—This task may include regulatory support for all Nuclear Regulatory Commission-related activities, such as licensing reviews and updates; preconstruction authorization site services, including performance confirmation testing; environmental, safety, and health compliance, including potential updates of the Environmental Impact Statement; and infrastructure tasks associated with information management, planning, project control, institutional and external affairs, and training to meet quality assurance, safety and health, and other DOE-mandated program requirements.
- Final Inspection and Acceptance of Construction—This task may be performed by the design/licensing contractor, except in a turnkey-type activity where the designer would be reviewing its own work. In these cases, DOE will procure the services of an independent contractor to conduct inspections and provide acceptance support.

2.1.1.3 Transportation

The transportation phase will address transportation issues, with varying degrees of focus on planning, mobilization, and operations. This phase is expected to begin in March 2005 and run through 2041. However, pretransportation phase activities may begin as early as 2002. DOE's procurement strategy provides opportunities for private industries to work with DOE to accomplish its mission objectives. DOE will purchase services and equipment from a regional servicing contractor-operated waste acceptance and transportation organization, as described in the draft Request for Proposal dated September 1998 [Reference 6]. The contractor is expected to provide initial financing for the project, including funds necessary for the initial acquisition of operational equipment; establish the necessary management organization; and mobilize the necessary resources and capabilities to provide spent nuclear fuel acceptance delivery services based on a fixed-dollar rate per fuel assembly delivered from each purchaser's site. DOE will retain final approval on all transportation routes and maintain primary responsibility to the states, tribes, and local units of government for assuring appropriate interaction and consideration of their input on the transportation of spent nuclear fuel. The regional servicing contractors will provide all hardware necessary for waste acceptance, transportation, and cask handling and any specialized equipment required for unloading.

To achieve DOE's objectives and provide a capability for responding to contingencies, the contiguous United States is divided geographically into four servicing regions for purposes of this procurement. DOE anticipates that multiple contracts for Phase A (planning) activities will be awarded; however, DOE will reserve the right to award one or more contracts for Phase A activities. DOE will then authorize the regional servicing contractors to proceed into Phase B (mobilization). Phase C (conduct of operations) will commence once a facility becomes operational.

The draft Request for Proposal [Reference 6] states that the "procurement is to contract with private industry for the provision of services, including equipment, to accept spent nuclear fuel at purchaser sites on behalf of DOE and transport the spent nuclear fuel to the federal facility for disposal."

The draft Request for Proposal [Reference 6] has incorporated a number of specific operational details and enhancements that go beyond those currently in the standard contract for disposal of

spent nuclear fuel and/or high-level radioactive waste set forth in 10 CFR Part 961 (Standard Contract). DOE intends to negotiate a bilateral modification of the standard contract, accordingly. These enhancements will allow parties to more effectively and efficiently schedule waste acceptance activities and provide a better understanding of the roles and expectations of the purchasers, DOE, and the regional servicing contractors. The following specific functional areas will constitute much of the scope of this contracted activity:

- **Planning**—This task may include development of detailed management, site servicing, and operational plans and prices for subsequent contract phases and will determine the annual, site-specific, fixed-rate in dollars per fuel assembly for each site being serviced in their region.
- **Mobilization**—This task may last approximately 14 years. The first four years will focus on initial equipment acquisition and operational readiness; mobilization of purchaser site resources and equipment; finalization and Nuclear Regulatory Commission approval of routing; establishment of logistics, security and escorts, communications, real-time tracking, and emergency response capabilities; contracting for all support services; obtaining necessary licenses and permits; and initiating communications and outreach services consistent with the servicing schedules. The last 10 years will be a continuation of the communications and outreach services and other related activities.
- **Operations**—It is anticipated that the 10-year operations period will run concurrently with the last 10 years of the 14 year mobilization period. This task may last 10 years and will begin once a federal facility is operational. The regional servicing contractors will begin accepting spent nuclear fuel at designated purchaser sites in accordance with its Regional Servicing Plan, with subsequent transport to the federal facility. Additionally, the regional servicing contractors may provide appropriate storage units to the federal facility; perform cask and equipment maintenance; deploy new equipment, as necessary; maintain outreach activities, licenses, and permits; maintain a 24-hour-per-day emergency support hot line; and monitor real-time tracking for shipments. Once this phase is complete, all equipment designated by the Contracting Officer and purchased under the contract will be transferred to DOE. The regional servicing contractors will be responsible for deactivating all regional servicing contractor facilities and disposing of all wastes, including hazardous and low-level radioactive waste generated during the course of Phase B and Phase C.
- **Modification of the Statement of Work**—The statement of work may be modified to include waste acceptance and transportation requirements (excluding shipping casks) for DOE-owned spent nuclear fuel, which was irradiated at civilian facilities and for which fees have been paid under the standard contract. The spent nuclear fuel is stored at various DOE facilities throughout the United States and includes approximately 76 metric tons of uranium. It is anticipated that the statement of work also will be modified to cover the acceptance and transportation of DOE high-level radioactive waste.
- **Nevada Transportation**—If the Yucca Mountain site is licensed as a repository, shipments of spent nuclear fuel and defense high-level radioactive waste will move to and within the state of Nevada by some combination of rail, heavy haul truck, and legal weight truck. Rail shipments will require construction of a rail spur from existing mainline rail, and a heavy

haul truck route will require upgrades to whatever heavy haul route is selected. Legal weight truck shipments will comply with Department of Transportation routing guidelines for established highways; however, the states and tribes have the authority to designate another route if alternate routes are available.

Currently, there is no direct rail access to the proposed repository. There are two options for shipments entering the state of Nevada—construct a new branch rail line or use heavy-haul trucks on upgraded existing highways. The current assumption for planning and scheduling purposes is for a contractor to provide to DOE the branch rail detailed designed required for construction. Should a decision be made to construct a new branch rail line, DOE could either issue a new contract specific to this purpose or make it part of another contract. Operation and maintenance of a new branch rail line could be through a DOE contract with a short line operator.

DOE may determine that extensive use of heavy-haul trucks will be relied upon, an intermodal transfer facility may need to be constructed, and the designated route will require upgrades to accommodate heavy-haul trucks. For any transportation mode, DOE will work closely with the state to discuss road upgrades or rail issues. For the intermodal facility, DOE could issue a request for proposal for its design and construction specific to this purpose or make it part of another contracted activity. Operation of an intermodal transfer facility could be under a separate contract or part of a contract for heavy-haul operations.

2.1.1.4 Operations

The operations phase would begin upon the Nuclear Regulatory Commission's issuance of a license to DOE for the repository to receive and possess waste in approximately 2010 and would continue until closure and decommissioning of the facility in approximately 2116. It is anticipated that the operations contract may be executed 24 to 36 months prior to the operations phase to allow the contractor sufficient time to conduct preoperational activities. The following specific functional areas may constitute much of the scope of this contracted activity:

- **Start-up and Training Activities**—This task may include activities associated with the activation and start-up of surface facilities at the North Portal entrance and other sitewide systems, such as water supply and environmental monitoring. Additionally, this task may include activities associated with hiring, training, and certification of operations staff, construction inspections, operational readiness reviews, and testing integration.
- **Surface Emplacement Activities**—This task may include operation of the waste handling facilities at the North and South Portals, transfer operations, repackaging, radiological control, and decontamination. Additionally, this task may include activities associated with the operation and maintenance of the surface facilities at the North and South Portal entrances and other sitewide systems such as roads, water supply, environmental monitoring, and electrical distribution.
- **Subsurface Emplacement Operations**—This task may include the underground transportation and emplacement of waste packages, the operation and maintenance of subsurface

emplacement utilities, and ventilation. All retrieval operations necessary to recover failed packages or to retrieve packages for testing also may be included in this task.

- **Emplacement Drift Excavation**—This task may include excavation of the emplacement drifts that were not excavated during the construction phase because of operations requirements. All appurtenant chambers, turnarounds, ventilation shafts, and required hardware will be excavated. Additionally, this task may include excavated material handling, support system facility operations, subsurface and surface facility management, and integration.
- **Waste Packages**—This task may include continuing fabrication of waste packages for commercial spent nuclear fuel, including boiling water and pressurized water reactor assemblies; defense high-level radioactive waste; and DOE spent nuclear fuel, including Navy spent nuclear fuel.
- **Regulatory Compliance, Infrastructure, and Management Support**—This task may include regulatory compliance support for all Nuclear Regulatory Commission-related activities, such as reporting requirements; records retention; licensing reviews and updates; environmental, safety, and health compliance and monitoring, including potential updates of the Environmental Impact Statement; and infrastructure tasks associated with information management, planning, project control, institutional and external affairs, and training to meet quality assurance, safety and health, and other DOE-mandated program requirements.
- **Performance Confirmation**—This task will include a continuation of the performance confirmation program that began during the construction phase. This task may include the operation and maintenance of all tests and equipment associated with the performance confirmation phase, including analyses, evaluations and reporting of test results, and subsequent review of the Total System Performance Assessment models.

2.1.2 Support

Support service contracts provide an independent assessment that is necessary for proper program management. In addition, support activities can be used as a cost-effective method for obtaining short-term, specialized scientific, technical, and management expertise to solve unique problems and to contract work to the private sector consistent with Office of Management and Budget Circular A-76. Often, specialized skills are not required on a long-term basis, and it would not be prudent management to hire federal staff with specific skills for a short-term task. Given the changing phases of the OCRWM Program, the skills required to meet the characterization, design, regulatory, licensing, transportation, and potential construction and operations functions will change significantly as the Program progresses. Appropriate support contracts will be required from the present to at least 2010.

The following sections briefly describe the support activities currently in place and those anticipated in some functional form during the period covered by this Program Business Plan. These activities cover a broad range of services, including, but not limited to, administrative, quality assurance, technical oversight, and technical information management.

2.1.2.1 Management and Technical Support

The management and technical support contractor provides independent reviews of work in the areas of design, licensing, and construction of the potential geologic repository. Additionally, the management and technical support contractor provides management evaluation support, including independent analyses of Management and Operating (M&O) contractor work plans, schedules, and cost estimates. Specific management and technical support contractor support includes, but is not limited to, the following:

- Conduct independent technical reviews of the work accomplished by the DOE national laboratories and other contractors involved in the site characterization phase for Yucca Mountain, design and licensing of the potential geologic repository, and national transportation efforts.
- Review and analyze technical studies, papers, regulatory documents and reports, and major Program documents, such as the Process Model Reports, Site Recommendation, and License Application.
- Conduct independent peer reviews of designs, analyses, and physical process models.
- Review and analyze the designs and documents that support licensing and construction activities.
- Conduct independent analyses of contractor work plans, schedules, and cost estimates.
- Provide specific technical expertise, as required by OCRWM, in the following areas:
 - Nuclear engineering.
 - Performance assessment.
 - Waste acceptance and transportation operations.
 - Environment, safety, and health.
 - National Environmental Policy Act statutory requirements.
 - Licensing and Nuclear Regulatory Commission statutory framework.
 - Design, engineering, design analyses, design basis documents, and process modeling.
 - Physical sciences related to geology, hydrology, rock mechanics, and tectonics.

2.1.2.2 National Environmental Policy Act Support

The National Environmental Policy Act contractor is responsible for supporting public hearings and preparing the draft and final Environmental Impact Statements using technical data developed by OCRWM and the management and operating contractor. The NWPA requires that an Environmental Impact Statement is prepared and that it accompanies any recommendation to the President. Specific National Environmental Policy Act support includes, but is not limited to, the following:

- Develop and prepare National Environmental Policy Act documentation.
- Ensure that activities mandated by the NWPA are conducted in compliance with the National Environmental Policy Act requirements, the Council of Environmental Quality, and DOE National Environmental Policy Act implementing guidelines and requirements.
- Develop an Environmental Impact Statement to assess the environmental impacts associated with the construction, operation, monitoring, and eventual closure of a geologic repository for spent nuclear fuel and high-level waste. This includes impacts from connected actions, such as transportation.
- Provide support to OCRWM in the development of a Comment Response Document, which will address comments received during the draft Environmental Impact Statement public comment period.
- Assist DOE in identifying needs for additional data, notwithstanding the fact that the Environmental Impact Statement will draw primarily from information, data, and analyses generated to date by other DOE contractors and cooperating agencies.

2.1.2.3 Quality Assurance Support

The quality assurance support contractor evaluates Program compliance with Nuclear Regulatory Commission requirements, develops and maintains the OCRWM Quality Assurance Requirements and Description document and assists the OCRWM Office of Quality Assurance in providing overall quality assurance guidance and direction to all program participants. Specific quality assurance support includes, but is not limited to, the following:

- Provide analytical support in reviewing the major participants' quality assurance program documents, procurement documents, and suppliers' quality assurance documents.
- Verify the status, adequacy, effectiveness, and compliance with OCRWM's quality assurance program, including conducting surveillances, audits, inspections, and reviews.
- Assist OCRWM in developing, implementing, and coordinating its internal Quality Concerns Program.
- Provide assistance with quality assurance indoctrination and training activities.

- Facilitate interactions among OCRWM, the Nuclear Regulatory Commission, the Nuclear Waste Technical Review Board, external agencies, boards, commissions, and public/private organizations concerning quality assurance issues.
- Perform preliminary, in process, and final inspections and tests of witness and hold points established by project design documents.

2.1.2.4 Quality Assurance Management Assessment

The quality assurance management assessment contractor assists OCRWM in conducting its annual quality assurance management assessment to verify adequacy and effectiveness. The annual assessment includes, but is not limited to, the following:

- Evaluation of all OCRWM organizational components and other affected organizations (i.e., organizations that comply with the OCRWM Quality Assurance Requirements Document).
- Evaluation of the scope, status, adequacy, and effectiveness of the OCRWM quality assurance program. This evaluation is conducted from October 1 to July 1 of each fiscal year.
- Assessment of the following factors:
 - Effectiveness of procedural compliance.
 - Extent, adequacy, and effectiveness of quality assurance training.
 - Management and understanding of the objectives and benefits of the quality assurance program.
 - Management and staff acceptance of the quality assurance requirements as part of their daily activities.
 - Adequacy of resources available for quality assurance development, maintenance, and implementation.
 - Adequacy and effectiveness of the corrective action program.

2.1.2.5 Information Technology

The information technology contractor assists in the operation and management of the OCRWM communications network and computer facilities, including support to web-based licensing systems, web page development, computer hot line and help desk support, software and hardware installation and maintenance, and early evaluations of enhanced software. Specific information technology support includes, but is not limited to, the following:

- Manage, operate, maintain, and provide security for OCRWM network and computer facilities, including continuous, efficient, and effective operations of the OCRWM Wide Area Network(s) and Local Area Network(s).
- Provide training courses for OCRWM requirements and monitoring and reporting activities.
- Support OCRWM Information Management planning activities, including conducting technology assessments and evaluations, monitoring technology trends, and maintaining current hardware and software information.
- Provide administrative support and technical services necessary for optimum customer service, including help desk and technical support.
- Provide software engineering, design, development, and maintenance support.
- Manage the physical security system at the Yucca Mountain Site Characterization Office facility in Las Vegas, Nevada.

2.1.2.6 Administrative Support

Consistent with Office of Management and Budget Circular A-76, DOE has evaluated these activities and determined it is appropriate to contract for this support. Additionally, this allows more effective use of limited federal positions. The administrative support contractor provides administrative support to OCRWM on an as-needed basis. Specific administrative support includes, but is not limited to, the following:

- Operate a word processing center utilizing government-furnished equipment for producing draft and final copies of correspondence, reports, and other miscellaneous documents.
- Assist in ordering supplies and services, monitoring stock shelves in the self-service supply room, receiving office supplies, and coordinating the work of movers and carpenters.
- Perform internal mail distribution of interoffice correspondence and work-related materials.
- Perform routine administrative duties.
- Maintain proficiency in office equipment operations.
- Manage the day-to-day facility activities.

2.1.2.7 Financial Auditing Support

The financial auditing support contractor provides support to OCRWM consistent with the Government Management Reform Act and the Federal Managers Financial Integrity Act. It allows OCRWM to respond meaningfully to the mandate of Section 304(c) of the NWPA, which (among other things) requires that OCRWM annually report to Congress on the expenditures of the Office. Specific financial auditing support includes, but is not limited to, the following:

- Conduct an annual audit of OCRWM’s financial statements, which are published as an appendix to OCRWM’s Annual Report to Congress and incorporated into the DOE-wide consolidated financial statements, to determine whether they present fairly, in all material aspects, the financial position and results of operation and to ensure compliance with the current edition of the Form and Content of Agency Financial Statement published by the Office of Management and Budget.
- Prepare an opinion or disclaimer of opinion, as appropriate, for OCRWM’s financial statements.
- Prepare a report on OCRWM’s internal control structure.
- Prepare a report on OCRWM’s compliance with the laws and regulations expected to have a material effect on the financial statements under audit.
- Prepare a management letter describing internal control deficiencies not considered to be material weaknesses or reportable conditions.

2.1.2.8 Support Costs

Table 2-2 presents the anticipated cost profile by support element for the time period covered by the OCRWM Program Business Plan.

Table 2-2. Support Costs (in millions of 1998 dollars)

Year	MTS	NEPA	QA	QAMA	IT	ADMIN	AUDIT
2000	10 to 12	5.6	10 to 15	0.3 to 0.5	5 to 6	1.0 to 1.5	0.3 to 0.5
2001	10 to 12	0.2	10 to 15	0.3 to 0.5	5 to 6	1.0 to 1.5	0.3 to 0.5
2002	10 to 12	0	10 to 15	0.3 to 0.5	5 to 6	1.0 to 1.5	0.3 to 0.5
2003	10 to 12	0	10 to 15	0.3 to 0.5	5 to 6	1.0 to 1.5	0.3 to 0.5
2004	10 to 12	0	10 to 15	0.3 to 0.5	5 to 6	1.0 to 1.5	0.3 to 0.5
2005	10 to 12	0	10 to 15	0.3 to 0.5	5 to 6	1.0 to 1.5	0.3 to 0.5
2006	10 to 12	0	10 to 15	0.3 to 0.5	5 to 6	1.0 to 1.5	0.3 to 0.5
2007	10 to 12	0	10 to 15	0.3 to 0.5	5 to 6	1.0 to 1.5	0.3 to 0.5
2008	10 to 12	0	10 to 15	0.3 to 0.5	5 to 6	1.0 to 1.5	0.3 to 0.5
2009	10 to 12	0	10 to 15	0.3 to 0.5	5 to 6	1.0 to 1.5	0.3 to 0.5
2010	10 to 12	0	10 to 15	0.3 to 0.5	5 to 6	1.0 to 1.5	0.3 to 0.5

Further information on the Yucca Mountain Site Characterization Project portion of the cost in Table 2-2 can be found in Sections 5.2 and 6.0 of Volume 4 and Appendix F of Volume 5 of the Viability Assessment [References 3 and 4].

These cost estimates reflect DOE’s best estimates, given the scope of the work identified and planned schedule of required activities. Future budget requests for the program have yet to be established, and, in any event, will be determined through the annual executive and congressional budget process.

- IT = information technology*
- MTS = management and technical support contractor*
- NEPA= National Environmental Policy Act*
- QA = quality assurance*
- QAMA = quality assurance management assessment*

2.1.3 Financial Assistance

The NWPA specifies that technical assistance and funding shall be provided to state, local, and Indian tribal governments for open participation in OCRWM activities and training for public safety officials who have jurisdiction over the spent nuclear fuel or high-level radioactive waste transport routes. It is anticipated that financial assistance will be in the form of cooperative agreements and grants, as defined in the Federal Grant and Cooperative Agreement Act, Public Law 95-224. Additionally, it is anticipated that financial assistance will be available beginning in 2002.

2.1.3.1 Cooperative Agreements

The NWPA states that open participation in OCRWM activities is essential for promoting public confidence. Under the NWPA, governors, state legislatures, Indian tribes, and the general public are expressly designated as active participants in site consideration, investigation, and the approval process for repository siting and transportation.

Cooperative agreements will be awarded to nonprofit national and regional associations of states and tribes to conduct the following:

- Convene spent nuclear fuel and high-level radioactive waste transportation committees.
- Inform state and tribal officials on the status of spent nuclear fuel and high-level radioactive waste transportation relative to their jurisdictions.
- Monitor relevant regional, state, tribal, and local emergency preparedness and emergency response initiatives.
- Exchange information on state and tribal infrastructure initiatives related to the transportation of spent nuclear fuel and high-level radioactive waste.
- Participate in DOE Transportation External Coordination Working Group meetings, which will be co-chaired by OCRWM.

Continuing efforts to review and analyze data relevant to these issues; identifying new issues of concern to state, tribal, and local governments; and working toward resolution can best be accomplished through the framework of the existing associations' multistate or multitribal institutional forums, where the interests of all participants are represented.

2.1.3.2 Section 180(c) Grants

Section 180(c) of the NWPA states that technical and financial assistance will be provided to the states for training public safety officials of appropriate units of local government and Indian tribes through whose jurisdiction the Secretary of Energy plans to transport spent nuclear fuel or high-level radioactive waste to a facility authorized under the NWPA. This training will cover the procedures required to safely transport these materials, as well as procedures for dealing with emergency response situations.

After considering comments received on three prior notices, reviewing input from stakeholders in various forums, and conducting extensive research, the Federal Register (FR) published another Notice of Revised Proposed Policy and Procedures on April 30, 1998 (63 FR 23753). This notice details the policy and procedures by which OCRWM currently intends to implement Section 180(c) of the NWPA. The policy and procedures will remain in draft form until program progress or legislation provides definitive guidance as to when shipments will commence. At that time, OCRWM will finalize the policy and procedures or consider promulgating regulations on implementing Section 180(c).

2.1.3.3 Financial Assistance Costs

Table 2-3 shows the anticipated financial assistance profile for the time period covered by the OCRWM Program Business Plan.

Table 2-3. Financial Assistance
(in millions of 1998 dollars)

Year	Financial Assistance
2002	1
2003	1
2004	1
2005	1
2006	9
2007	5
2008	11
2009	11
2010	11
2011	12
2012	12

Further information on the cost in Table 2-3 can be found in the Total System Life Cycle Cost [Reference 5, pages 33–35].

These cost estimates reflect DOE's best estimates, given the scope of the work identified and planned schedule of required activities. Future budget requests for the program have yet to be established, and, in any event, will be determined through the annual executive and congressional budget process.

2.2 PROGRAM COST

The cost history and projection for the potential repository are presented in Tables 2-4 through 2-6. Table 2-4 provides a history of past Program activities by year-of-expenditure dollars. Table 2-5 provides an estimate of future cost in constant 1998 dollars, as discussed in the Total System Life Cycle Cost [5]; and Table 2-6 provides an incremental comparison (in constant 1998 dollars) of the Viability Assessment as a subset of the Total System Life Cycle Cost.

**Table 2-4. Program Cost History¹ (Nuclear Waste Fund and Defense Appropriations)
(in thousands of dollars)**

PROJECT	FY83	FY84	FY85	FY86	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	TOTAL
NUCLEAR WASTE FUND (OCRWM)																	
FIRST REPOSITORY																	
Basalt Project	42,959	60,307	69,848	104,487	128,179	61,707	8,656	4,592	1,368	909	475	221	71	3	0	0	483,783
Yucca Mountain Project ²	50,375	65,285	63,527	89,981	103,172	140,857	180,189	180,564	181,148	189,437	229,053	279,713	377,469	249,298	274,625	341,300	2,995,995
Salt Project	64,079	83,838	87,843	98,017	115,070	54,220	9,486	1,468	412	(193)	525	(257)	282	(155)	27	(238)	514,423
RTP/Technical Support	0	0	0	0	37,404	47,667	38,072	17,855	5,743	11,335	481	108	533	(2)	0	0	159,196
SECOND REPOSITORY	8,376	17,094	22,370	26,028	6,988	375	58	0	0	0	0	0	(3)	5	0	0	81,291
ATI PROJECT																	
MRS	3,723	10,436	15,339	5,925	1,384	1,364	1,566	2,109	5,459	21,336	15,385	3,698	8,152	114	0	0	95,990
Engineering Development ³	0	0	179	3,097	10,557	7,991	5,323	10,255	9,055	6,398	4,290	12,065	9,709	15,381	947	328	95,573
Transportation System	0	1,541	2,226	5,768	10,835	15,582	25,901	21,628	19,792	16,635	15,149	15,167	10,736	5,665	3,317	2,114	172,056
Waste Acceptance ⁴	0	0	0	0	0	0	0	0	0	0	6,630	3,721	4,748	4,195	675	738	20,708
Project Integration ⁵	0	0	0	0	0	0	0	0	0	0	0	0	1,785	3,611	1,033	1,752	8,181
Spent Fuel Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	2,331	3,318	1,588	7,237
PROGRAM INTEGRATION																	
Quality Assurance	0	0	0	0	0	136	471	1,588	2,911	3,179	10,593	12,628	11,744	18,297	15,478	10,670	87,696
Program Management and Integration ⁶	8,651	36,382	54,350	64,824	54,909	51,850	60,830	57,978	71,225	66,417	59,347	50,855	51,331	34,845	31,037	33,314	788,147
Human Resources and Administration	147	1,108	574	584	686	275	283	7,661	5,287	10,795	28,433	27,096	31,065	10,825	9,344	10,240	144,401
TOTAL (OCRWM)	178,311	275,992	316,255	398,711	469,185	382,025	330,836	305,698	302,400	326,248	370,360	405,015	507,622	344,413	339,801	401,806	5,654,677
NON-OCRWM⁷																	
NRC Fees	0	0	0	0	0	19,932	18,674	22,870	19,650	19,962	21,100	22,000	22,000	11,000	15,000	15,000	207,188
NWTRB	0	0	0	0	0	0	0	2,000	0	3,294	2,060	2,160	2,664	2,531	2,600	2,600	19,909
NWN	0	0	0	0	0	0	0	5,959	0	0	0	1,000	1,000	0	0	0	7,959
TOTAL (NON-OCRWM)	0	0	0	0	0	19,932	18,674	30,829	19,650	23,256	23,160	25,160	25,664	13,531	17,600	17,600	235,056

Note: Each cost entry is rounded to the nearest thousand. Minor discrepancies may occur in the totals due to rounding.

¹ All OCRWM cost categories are OCRWM baselined projects, except for First Repository, Program Integration, and the subdivisions of the ATI Project. OCRWM costs are from end-of-year Financial Information System reports.

Non-OCRWM costs before FY90 are NRC-reported costs; after FY89, the costs are appropriations.

² Includes \$100M, \$120M, \$129.43M, \$200M, and \$190M in funding from Defense Nuclear Waste Appropriation in FY93, FY94, FY95, FY96, FY97, and FY98, respectively.

³ Engineering development costs include MPC development from FY93 through FY98.

⁴ Waste acceptance costs prior to FY93 were included in program management and integration.

⁵ MRS project support costs are in program management and integration in FY93, FY94, and FY96 and in ATI project integration in FY95.

⁶ Includes debt service from FY83 to FY85 of \$3.316M, \$4.472M, and \$2.512M, respectively. Does not include FY88 and FY89 NRC fees cost of \$38,606,205 recorded in the Financial Information System in FY89.

⁷ All costs are appropriations, except for NRC fees in FY88 and FY89. The costs for FY88 and FY89 are actual costs reported by NRC.

ATI = acceptance, transportation, and integration

FY = fiscal year

MPC = multipurpose canister

MRS = monitored retrievable storage

NRC = Nuclear Regulatory Commission

NWN = Nuclear Waste Negotiator

NWTRB = Nuclear Waste Technical Review Board

OCRWM = Office of Civilian Radioactive Waste Management

RTP = Repository Technology Program

These cost estimates reflect DOE's best estimates, given the scope of the work identified and planned schedule of required activities. Future budget requests for the program have yet to be established, and, in any event, will be determined through the annual executive and congressional budget process.

**Table 2-5. 1998 Total System Life Cycle Cost Estimate Summary
(in millions of 1998 dollars)**

Cost Element	WBS/Cost Account	Historical (1983-1998)	Future Cost Without Contingency	Contingency Cost	Total Cost	Contingency Percentages
Monitored Geologic Repository Costs	1.2	4,910	20,620	3,590	29,120	0-40
Development and Evaluation (1983-2002) Costs		4,910	990	0	5,900	0
Single Repository (MGR) (Yucca Mountain Site)	1.2	3,210	990	0	4,200	0
Other First Repository Characterization	N/A	1,590	0	0	1,590	0
Second Repository	2	110	0	0	110	0
Surface Facilities		0	5,480	1,100	6,580	14-40
Licensing		0	120	30	150	24
Preemplacement Construction		0	900	280	1,180	31
Emplacement Operations		0	3,790	530	4,320	14
Monitoring Operations		0	570	230	800	40
Closure and Decommissioning		0	100	30	130	30
Subsurface Facilities		0	5,310	710	6,020	0-17
Licensing		0	90	0	90	0
Preemplacement Construction		0	860	120	980	14
Emplacement Operations		0	3,230	430	3,660	13
Monitoring Operations		0	950	130	1,080	14
Closure and Decommissioning		0	180	30	210	17
Waste Package Fabrication		0	4,980	970	5,950	0-20
Licensing		0	40	0	40	0
Preemplacement Construction		0	50	0	50	0
Emplacement Operations		0	4,870	970	5,840	20
Monitoring Operations		0	20	0	20	0
Closure and Decommissioning		0	0	0	0	0
Performance Confirmation		0	1,780	540	2,320	0-30
Licensing		0	100	30	130	30
Preemplacement Construction		0	190	50	240	26
Emplacement Operations		0	810	270	1,080	33
Monitoring Operations		0	680	190	870	28
Closure and Decommissioning		0	0	0	0	0
Regulatory, Infrastructure, and Mgmt Services		0	2,080	270	2,350	9-22
Licensing		0	320	30	350	9
Preemplacement Construction		0	460	40	500	9
Emplacement Operations		0	880	110	990	13
Monitoring Operations		0	370	80	450	22
Closure and Decommissioning		0	50	10	60	20
Waste Acceptance, Storage, and Transportation	3	480	5,100	810	6,390	0-20
Development and Evaluation (1983-2005) Costs		480	50	0	530	0-10
Storage (No Interim Storage Fund Facility)		200	0	0	200	0
Transportation		210	30	0	240	0
Waste Acceptance		20	10	0	30	0
Multipurpose Canister Project		40	0	0	40	0
Program Management and Integration		10	10	0	20	0
Mobilization and Acquisition (2005-2010)		0	120	20	140	0-20
National Transportation		0	100	20	120	20
Waste Acceptance		0	10	0	10	0
Program Management and Administration		0	10	0	10	0
Operations (2010-2042)		0	4,930	790	5,720	16-17
National Transportation		0	4,880	780	5,660	16
Waste Acceptance		0	50	10	60	20
Nevada Transportation	1.2	0	520	270	790	13-60
Engineering and Construction		0	440	260	700	60
Operations		0	80	10	90	13
Program Integration	9	1,480	2,290	220	3,990	0-12
Program Management and Administration	9.1	1,210	1,900	220	3,330	12
Quality Assurance	9.2	90	520	60	670	12
Program Management and Integration	9.3	960	1,140	130	2,230	11
Human Resources and Administration		160	240	30	430	13
Non-OCRWM Nuclear Waste Fund Costs		270	390	0	660	0
Nuclear Regulatory Commission Costs	N/A	240	360	0	600	0
Nuclear Waste Technical Review Board	N/A	20	30	0	50	0
Nuclear Waste Negotiator	N/A	10	0	0	10	0
Institutional Costs		210	2,590	600	3,400	0-32
Payments Equal to Taxes	1.2.10	40	1,700	540	2,280	32
Benefits	1.2.10	0	470	0	470	0
180(c) Assistance	3	0	390	60	450	15
Financial Assistance	1.2.10	170	30	0	200	0
TOTAL CRWMS COST		7,080	31,120	5,490	43,690	

CRWMS = Civilian Radioactive Waste Management System OCRWM = Office of Civilian Radioactive Waste Management
MGR = Monitored Geologic Repository WBS = work breakdown structure

These cost estimates reflect DOE's best estimates, given the scope of the work identified and planned schedule of required activities. Future budget requests for the program have yet to be established, and, in any event, will be determined through the annual executive and congressional budget process.

**Table 2-6. Comparison of the Viability Assessment Cost Estimate
With the Total System Life Cycle Cost Estimate
(in millions of 1998 dollars)**

Cost Element	VA Cost	TSLCC Increment	TSLCC Total
Historical Costs (1983–1998)	0	7,080	7,080
Repository Future Costs	19,700	4,510	24,210
Development and Evaluation ¹	990	0	990
Surface	5,430	1,150	6,580
Subsurface	5,000	1,020	6,020
Waste Package Fabrication	4,060	1,890	5,950
Performance Confirmation	2,060	260	2,320
Regulatory, Infrastructure, Management Support	2,160	190	2,350
ATI Future Costs	0	5,910	5,910
Nevada Transportation	0	790	790
Program Integration Future Costs¹	30	2,480	2,510
Institutional Future Costs	60	3,130	3,190
Payments Equal to Taxes ¹	30	2,210	2,240
Benefits	0	470	470
180(c) Assistance	0	450	450
Financial Assistance ¹	30	0	30
Total²	19,790	23,900	43,690

Note: The 1998 historical cost is an estimate. These cost estimates reflect DOE's best estimates, given the scope of the work identified and planned schedule of required activities. Future budget requests for the program have yet to be established, and, in any event, will be determined through the annual executive and congressional budget process.

¹ Viability Assessment Volume 4 costs of \$1,080 million in constant 1998 dollars (\$1,138 million year of expenditure) have been divided into these four categories.

² The Viability Assessment Volume 5 total cost estimate is \$18,716 million in constant 1998 dollars.

ATI = Acceptance, Transportation, and Integration

TSLCC = total system life cycle cost

VA = Viability Assessment

3.0 ACCOMPLISHMENTS AND FUTURE MILESTONES

The Fiscal Year 1997 Energy and Water Development Appropriations Act directed the Secretary of Energy to complete and provide to the President and Congress a Viability Assessment of the Yucca Mountain site. The Viability Assessment was completed and submitted to Congress in December 1998.

The Viability Assessment is a compilation of over 15 years of intensive, scientific, and technical work at the Yucca Mountain site. It is a synthesis of information and data regarding the Yucca Mountain site's ability to contain spent nuclear fuel and high-level radioactive waste. The Viability Assessment describes the Yucca Mountain site, presents the repository and waste package designs and costs, and details the results of a quantitative Total System Performance Assessment that describes how the site's engineered and natural barriers work together as a system. The Viability Assessment also contains a plan and costs associated with submission of a License Application to the Nuclear Regulatory Commission, as well as costs to construct and operate a repository at the Yucca Mountain site.

The Viability Assessment provides the foundation for the Program's current and planned activities at Yucca Mountain, including determining whether the Yucca Mountain site is suitable as a repository, developing documentation needed for a Secretarial decision (as appropriate) on the Site Recommendation to the President (Fiscal Year 2001), and activities associated with the federal government's waste acceptance obligations.

The OCRWM Program is continuing the transition that began in Fiscal Year 1999. This transition involves shifting Program emphasis from the collection of basic data to activities that support the remaining key near-term objectives articulated in the NWPA (i.e., preparation of materials to support a Site Recommendation Report to the President and submission of a License Application to the Nuclear Regulatory Commission). These activities were described, in large part, in Volume 4 of the Viability Assessment [Reference 3]. The work generally includes further refinement of repository and waste package designs, continued evaluation of repository behavior through Total System Performance Assessment, refinement of the conceptual and numerical models used in evaluating repository performance, and continued scientific investigations to reduce key uncertainties about the Yucca Mountain site.

Following issuance of the draft Environmental Impact Statement for the Yucca Mountain site in Fiscal Year 1999, the OCRWM Program, through the Yucca Mountain Site Characterization Office, will focus principally on completing the final Environmental Impact Statement and on technical and scientific investigation activities and repository and waste package design activities. These activities will serve to support a decision on whether to recommend the Site to the President in Fiscal Year 2001 and continue preparing a License Application for submission to the Nuclear Regulatory Commission in Fiscal Year 2002. Activities proposed to be undertaken at the Yucca Mountain site are fully consistent with the description of the remaining work contained in the Viability Assessment.

The Office of Acceptance, Transportation, and Integration will continue to focus on the development of implementation plans for achieving the legal and physical transfer of spent

nuclear fuel from reactor sites and DOE-operated sites (e.g., Hanford, Idaho, Rocky Flats, Savannah River) once a Federal facility becomes available. DOE also will continue to develop acquisition plans for waste acceptance and transportation services utilizing private sector entities. This approach offers a market stimulus for commercial development of the equipment and management capabilities required for waste acceptance and transportation of the spent nuclear fuel and high-level radioactive waste [References 6 and 7].

Significant Program milestones and accomplishments over a 20-year period are presented in Figure 3-1.

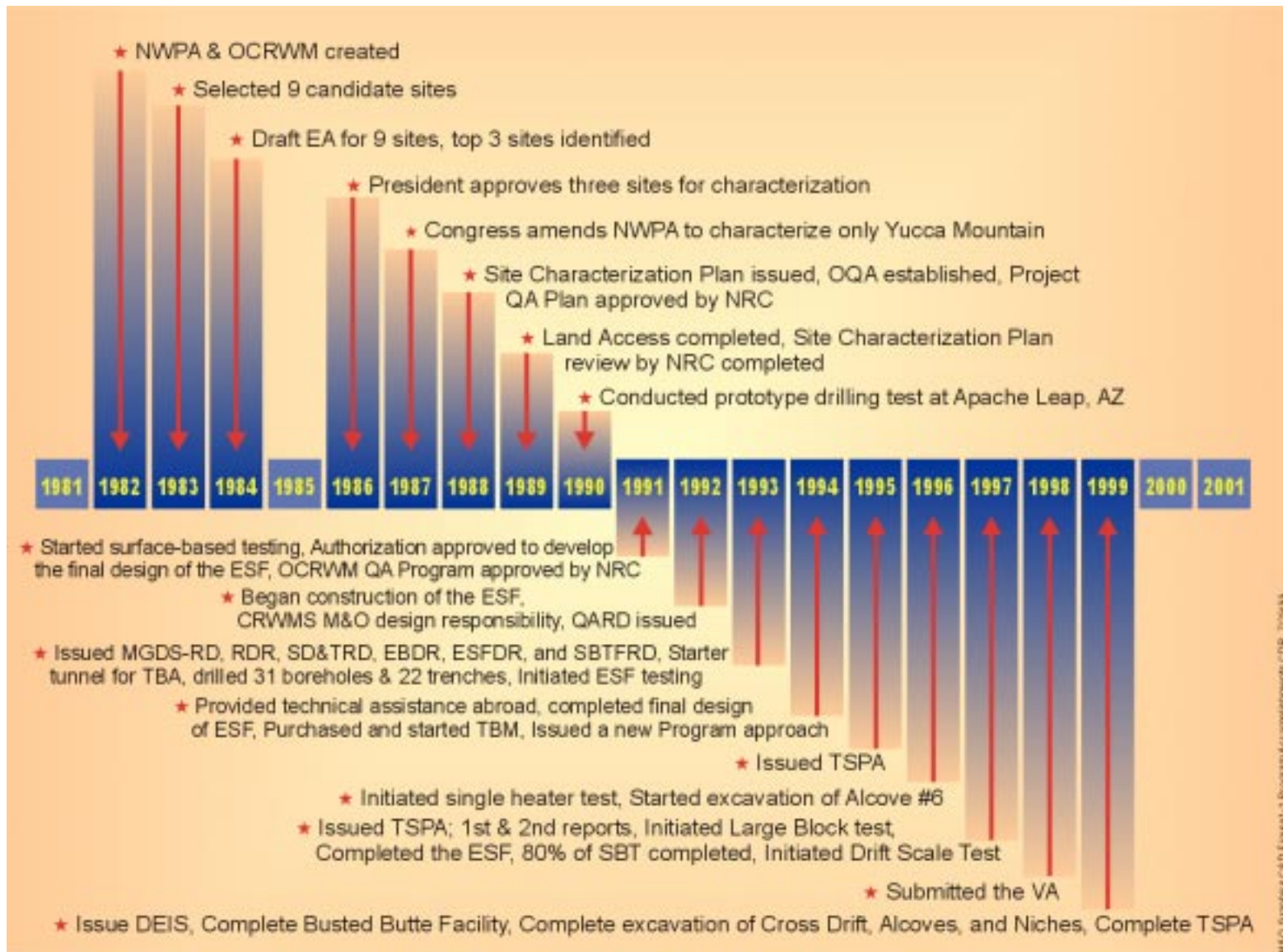


Figure 3-1. Program Milestones and Accomplishments

4.0 CONTRACT METHODOLOGY

Between 2000 and 2010, various new activities will be contracted and some current activities may continue. Contractors possessing different areas of expertise than those currently on board may be required to support new activities. The site characterization phase at the Yucca Mountain site is coming to a close, and if the site is found suitable and is approved and licensed, the OCRWM Program activities at Yucca Mountain will shift from a focus on science and design to a focus on construction and operations. The OCRWM Program Business Plan will address this changing focus. Primary activities at Yucca Mountain from now through 2010 will include design activities; licensing activities; Total System Performance Assessment; procurement; construction and fabrication; testing and site data; operations and maintenance; environment, safety, and health; training; and project services.

The Office of Acceptance, Transportation, and Integration will concentrate its efforts on planning for transportation services and activities and continued development of Standard Contracts to allow finalization of the schedules and procedures that will affect the transfer of spent nuclear fuel to the federal government. The Program Management Center will continue to conduct such major activities as coordinating Program-wide strategic and contingency planning, including developing revisions to OCRWM's Program Plan; developing and submitting OCRWM's annual reports to Congress; developing and submitting the Program's audited financial statements; conducting and publishing fee adequacy analyses; submitting annual budgets; and conducting financial audits of all Program participant organizations.

The government is committed to developing more innovative and competitive approaches to the procurement process. Each of the four major activities described in Section 2.1.1 may be contracted separately or combined in appropriate combinations, such as design/construction or construction/operations. The existing M&O contract could be extended in part or in total. Alternatively, a multiphase, long-term contract could be executed. This contract would evolve over time to cover the major Program activities.

The following sections discuss possible acquisition scenarios and potential issues that may be encountered during acquisition planning.

4.1 CONTRACT APPROACH

The current M&O contract expires in February 2001, and OCRWM is considering implementing alternative contracting methodologies. The Office of Management and Budget has asserted that competition and use of a performance-based service contract pilot for DOE is their preferred method for meeting the continuing Program requirements for contractor support. Given the government's policy and the inherent benefits of competition within the marketplace, competition will be the preferred acquisition method used for the major contracted activities discussed in this Program Business Plan. Due to the complexities of this major national program, any contractor will be required to have exceptional capabilities in management, planning, and integration. In addition, the OCRWM Program has developed an integrated safety management process based on surveys and benchmarks from other DOE and industry practices. Safety Management Plans are an integral part of planning work and are integrated into work

performance. All personnel and organizations working for the OCRWM Program must accept and implement the integrated safety management culture and blend it into their lowest-level work instructions.

In reviewing the work to be accomplished, a possible initial acquisition strategy may include acquiring a contractor with such core competencies as successful licensing experience and successful nuclear project/operations management capabilities. The primary activity could include design/licensing and construction preparation. The contract period of performance could run for five years with a five-year option. It is anticipated that the design/licensing contractor could have or would acquire a major subcontractor experienced in large nuclear and/or civil construction projects for construction or construction management support. The construction or construction management subcontract could overlap portions of the period of performance for the design/licensing contractor and would have the flexibility of beginning at any point in time and being reassigned to DOE or a DOE-designated contractor. The design/licensing-contracted activities could be initiated in the fall of 2000 with a transition period that would extend to February 11, 2001. By the beginning of transition in late Fiscal Year 2000, drafts of all technical documentation for Site Recommendation and License Application should be completed. Transition in late Fiscal Year 2000 would allow the design/licensing contractor to become familiar with the draft technical documentation, participate in near- and long-term planning activities, and review the design. In the near future, it may be necessary to have a major construction or construction management subcontractor provide constructibility reviews, initiate procurement of long-lead construction items, and develop integration and implementation plans for a significant construction activity in March 2005. DOE will determine at a later date whether the design/licensing contractor will subcontract for the construction or construction management contract or whether it will be a DOE prime contract.

A second major contracted activity could be initiated as early as 2006 or as late as 2008. As with the design/licensing-contracted activity, this could be a five-year contract with up to a five-year option. The primary focus of this contract would be on repository operations and, beginning in 2010, regulatory compliance. The operating contractor could be in place as early as 2006 to assist DOE (the licensee applicant) in developing preoperability testing procedures; conducting preoperability testing of structures, systems, and components important to safety; assisting in finalizing technical specifications and operation procedures; and establishing a personnel training and certification program.

A third major contracting activity could focus on transportation. As presented in the drafts request for proposal [Reference 6], the time frame for this procurement ties in with the anticipated schedule discussed above.

There are many smaller activities going on during this period, such as performance assessment, performance confirmation, testing at the site, and site services. It is anticipated that the first major contracted activity initiated will include all of these types of activities. Additionally, it is anticipated that the responsible contractor will acquire these activities using the most prudent, cost-effective approach. While Bechtel Nevada (the Nevada Operations Office management and operating contractor) currently performs many site services, it may be more prudent by Fiscal Year 2003 to acquire these services from other independent contractors. Contractual decisions will be made with a focus on serving the best interest of the government. For example, it is

anticipated that most of the construction activities and site services can be performed utilizing firm-fixed-price contracts.

While there are several options available for combining the major contracted activities, the above scenario was developed based on the fact that DOE will be the licensee and a limited number of federal staff will be available to oversee and direct contractor activities.

4.2 STATEMENTS FOR CONSIDERATION

This section presents areas that OCRWM will continue to evaluate as the Program continues to mature. The path forward will require careful consideration of multiple variables, some of which will not be fully known until DOE is in the licensing process.

4.2.1 Design

If there is a change in architect-engineering firms for the repository prior to submittal of the License Application and subsequent receipt of a Construction Authorization, a number of considerations must be addressed to minimize potentially deleterious effects on the Yucca Mountain Site Characterization Project and its schedule.

In the 1980s, a number of qualified architect-engineering firms were engaged in domestic nuclear work. However, by the early 1990s, large domestic nuclear projects had been completed. Most of the domestic architect-engineering nuclear work has been associated with nuclear plant modifications under 10 CFR 50.59, which is a very limited scope. A few architect-engineering firms have some experience in designing, licensing, and constructing at-reactor storage facilities. A small number of architect-engineering firms have maintained their large nuclear facility expertise by designing and constructing nuclear plants overseas. Thus, it is possible that much expertise in designing, licensing, and constructing large domestic nuclear facilities has been lost as personnel and companies have moved on to other business areas. Including “years of experience” requirements in the request for proposal may minimize potential performance liabilities in this area.

The new architect-engineering firm must understand the importance of reviewing, approving, and (if necessary) revising all quality-affecting calculations performed previously by former architect-engineering firms. Additionally, the new architect-engineering firm may want to change the inherited design developed by the previous architect-engineering firm. This would, of course, result in additional (and possibly unnecessary) costs and project delays. There appears to be some risks involved in changing the architect-engineering firms currently performing the design, and it may be appropriate to have all firms in the competitive range of a procurement perform a “due diligence” review of the current design activities.

One method for evaluating the architect-engineering firms would be to include a requirement in the request for proposal that bidders falling within the competitive range of the procurement submit a design review limited to the area of fatal flaws. This could require the offeror to become familiar with the current design prior to contract award, rather than “learn as you go” after contract award. The request for proposal could also require that the offeror identify future work to be done based on the results of its design review. This approach may minimize the

likelihood of the new architect-engineering firm identifying changes “needed” in the existing design after contract award, especially if performance awards are tied to the efficacy of such a preaward design review. The quality assurance portion of the design review cannot be performed until after contract award.

4.2.2 Contract Characteristics

The Office of Management and Budget has recommended that OCRWM consider using the recompetition of the current management and operating contract as a pilot for performance-based contracting. The Fiscal Year 1999 passback from the Office of Management and Budget included the following statement:

“The management and operating contract for the Yucca Mountain Program will expire in Fiscal Year 2001. The Department should consider including this management and operating contract as a pilot for demonstrating performance-based contracting, see Management passback section.”

OCRWM currently is working with several offices within DOE to aid in developing its detailed acquisition approach and contracts that will result from completion of the OCRWM Program Business Plan. Performance-based contracting, as well as other contracting methods, have been considered.

4.2.3 Mix of Contractors

A wide variety of contractor skills and expertise may be required for the design, licensing, construction, and operation of the repository. The need will span architect-engineering; nuclear and nonnuclear contracting managers; and construction, licensing, and nuclear facility operations firms to complete the segments of work required to build and operate a repository. In addition to these firms, there is a need for infrastructure management firms to provide power and other utilities, motor pool services, equipment maintenance, roads and grounds maintenance, medical and safety systems support, and other site support functions. It may be that a single contractor or team of contractors can provide all of these functions. Additionally, there is a need for a mix of support and technical services, including information technology, operations, quality assurance audits and inspections, and advisory and assistance services. The challenge for developing the final acquisition plan is twofold—to determine the appropriate mix and integration of work scopes and to identify the time phases for bringing the contracts/contractors on line.

4.2.4 Contract Philosophy

There are several different possible views of the most beneficial use of contract types and attributes. Basically, there are two contract types—cost and fixed price—with several attributes, such as award fee, performance-based, firm-fixed price, and cost-incentive contracts. In addition, there are opportunities for privatization where the commercial marketplace assumes responsibility for selling a service or commodity to the government and recovering its investment in the selling price. DOE is considering privatization for the regional servicing contractors to transport spent nuclear fuel and high-level radioactive waste.

4.2.5 Site Support and Security Services

The Nevada Operations Office management and operating contractor provides many site services. Due to the limited work currently being performed at the site by the OCRWM Program, this appears to be an efficient way for the government to operate. As site activities for the OCRWM Program begin to increase during on-site construction and infrastructure development, it may be appropriate to analyze the necessary site services to determine whether the OCRWM Program would be better served by having its own integrated site services/security function. This level of critical services may need to be under direct OCRWM management and control to more efficiently support the complex parallel construction activities. Additionally, construction activities may be less subject to disruptions if these types of services are directly integrated into the Program operations.

4.2.6 Construction Manager

Since the majority of the work is performed simultaneously and sequentially by different contractors, a significant effort is required to schedule, stage, and coordinate Program activities.

In the past, DOE has managed this function with one of two contract entities—a construction manager or a management integrator contractor. The magnitude of the OCRWM Program requires a special management approach.

4.2.7 Major Decisions

The OCRWM Program recently completed the Viability Assessment, which described the status of and planning for the Yucca Mountain Site Characterization Project as of the date of publication. As with any major project, evolving circumstances must be evaluated and determinations must be made to move the project forward. DOE will determine the appropriate course of action for the following circumstances, as necessary, to achieve the Yucca Mountain Site Characterization Project mission.

- Contractor Strategy—Determine which types of contracts are needed and when to award them.
- Multiple Underground Contractors—Determine whether staging and scheduling issues outweigh the efficiencies gained by using multiple contractors.
- Buy a Tunnel Versus Government-Furnished Equipment—Determine whether providing tunnel boring machines and other major equipment as government-furnished equipment provides benefits over buying the end product and allowing the contractor to use its own equipment.
- Use of the Nevada Test Site Low-Level Radioactive Waste Facility—Determine whether using the existing low-level radioactive waste disposal facility at the Nevada Test Site is more beneficial over constructing another facility for exclusive repository use.

- Nevada Transportation—Determine the most advantageous transportation method to use for waste transport within the state of Nevada. Both heavy-haul and rail provide benefits and have certain limitations. DOE will work with state and local governments to evaluate and determine whether to use heavy-haul trucks or rail for transporting waste.

4.2.8 Contracting/Subcontracting/Privatization Opportunities

As the OCRWM Program progresses toward emplacement of waste in 2010, there are abundant contracting/subcontracting opportunities. Some of the services identified under Site Support and Security Services are prime opportunities for contracting/subcontracting with local entities or privatization activities in which the contractor would furnish the land, facilities, and equipment to provide the service. Portions of the construction and operations services can be contracted directly or subcontracted, including waste package fabrication, which could be a privatization opportunity conducted off site versus on site. Facilities to provide housing, food, and other services for construction and operations employees at the site could be located immediately off site, which would facilitate additional privatization opportunities. A portion of the incentives for the primary contractors could be provided for the subcontracting/privatization activities they conduct, including contracting with small, small disadvantaged, and women-owned businesses.

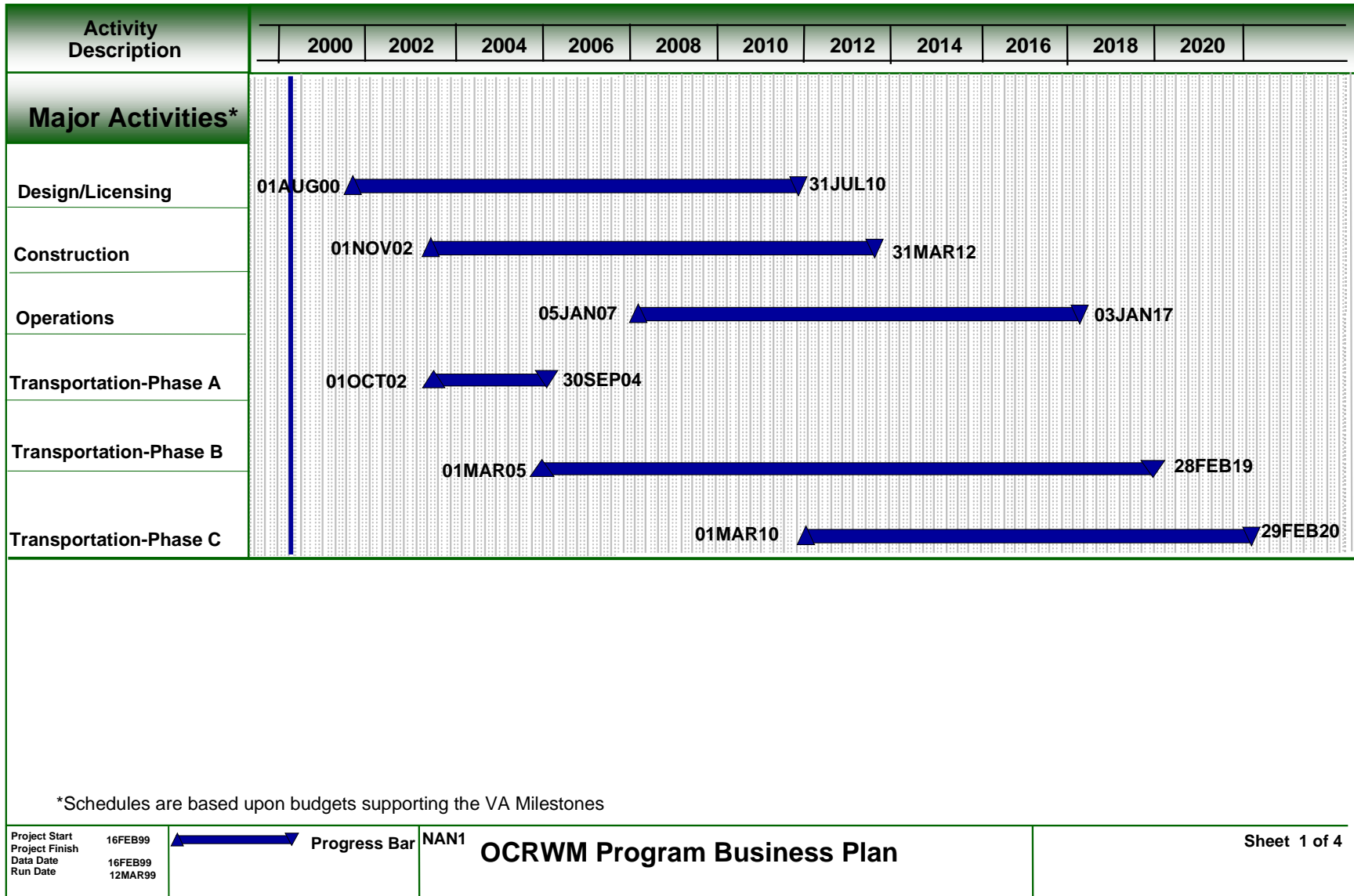
5.0 CONCLUSIONS

As stated in Section 1.1, the OCRWM Program Business Plan is a living document with major focus on near-term activities. Experience gained in the near term will be factored into subsequent, longer-term contracting strategies.

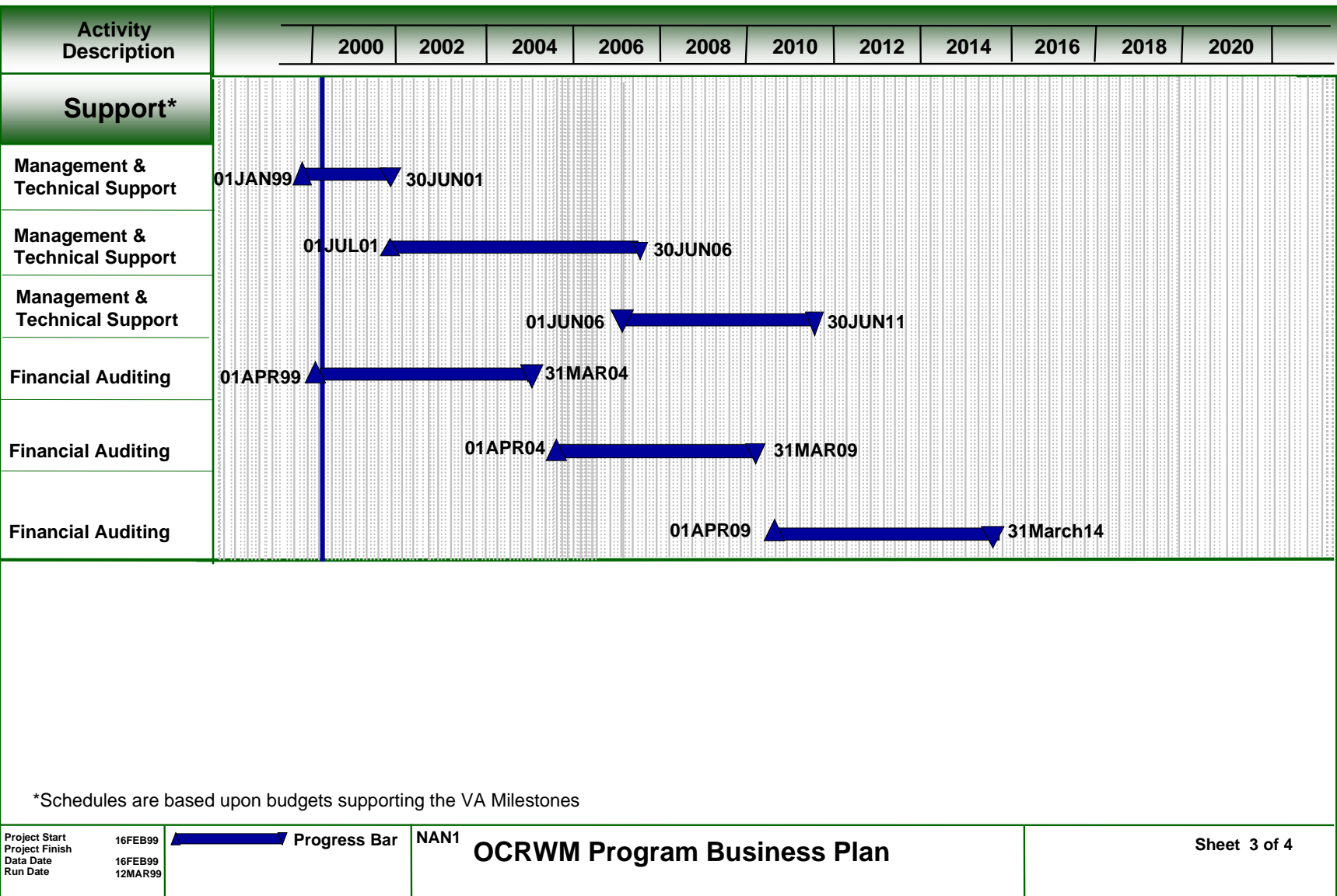
OCRWM will review and analyze all activities currently being performed, as well as critical additional activities for the design/licensing phase. Decisions on specific types of contracts, as well as the scope of work for contracted activities, will be made based on the analyses. The design concerns discussed in Section 4.2.1 will be considered to ensure no deleterious effects on the Program's near-term schedules. Procurement-sensitive acquisition plans will be issued for each subsequent procurement action.

Based on current DOE policy and appropriation language, OCRWM will compete the current management and operating contract.

6.0 SCHEDULES



Activity Description	Year																								
	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018	2020														
Support*																									
Jason (EIS Support)													01JAN99												30SEP01
Quality Assurance													01JAN99												24APR01
Quality Assurance															25APR01										25APR06
Quality Assurance																	25APR06								24APR11
Administrative Support													01JAN99												30NOV00
Administrative Support															29NOV00										25NOV05
Administrative Support																	01DEC05								30NOV10
Quality Management													01JAN99												05DEC00
Quality Management															06DEC00										05DEC05
Quality Management																	06DEC05								05DEC10
ADP Services															23MAY99										24MAY04A
ADP Services																	23MAY04								22MAY09
ADP Services																				23MAY09					22MAY14
*Schedules are based upon budgets supporting the VA Milestones																									
Project Start	16FEB99	Progress Bar		NAN1							Sheet 2 of 4														
Project Finish	16FEB99																								
Data Date	16FEB99																								
Run Date	12MAR99																								
OCRWM Program Business Plan																									



Activity Description	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018	2020	
Financial Assistance Awards*												
NWPA "180(c)" Grants												
Cooperative Agreement												
<p>*Schedules are based upon budgets supporting the VA Milestones</p>												
Project Start Project Finish Data Date Run Date	16FEB99 16FEB99 12MAR99			Progress Bar		NAN1		OCRWM Program Business Plan				Sheet 4 of 4

7.0 REFERENCES

- [1] U.S. Department of Energy, Office of Civilian Radioactive Waste Management, Program Plan, Revision 2, DOE/RW-0504, July 1998.
- [2] U.S. Department of Energy, Office of Civilian Radioactive Waste Management, Viability Assessment of a Repository at Yucca Mountain, Overview, DOE/RW-0508, December 1998.
- [3] U.S. Department of Energy, Office of Civilian Radioactive Waste Management, Viability Assessment of a Repository at Yucca Mountain, Volume 4: License Application Plan and Costs, DOE/RW-0508, December 1998.
- [4] U.S. Department of Energy, Office of Civilian Radioactive Waste Management, Viability Assessment of a Repository at Yucca Mountain, Volume 5: Costs to Construct and Operate the Repository, DOE/RW-0508, December 1998.
- [5] U.S. Department of Energy, Office of Civilian Radioactive Waste Management, Analysis of the Total System Life Cycle Cost of the Civilian Radioactive Waste Management Program, DOE/RW-0510, December 1998.
- [6] U.S. Department of Energy, Draft Request for Proposal No. DE-RP01-98RW00320, September 1998 (Available on the Office of Civilian Radioactive Waste Management Home Page at <http://www.rw.doe.gov>).
- [7] U.S. Department of Energy, Office of Civilian Radioactive Waste Management, Nuclear Waste Disposal/Executive Budget Summary, Fiscal Year 2000 Congressional Budget, January 1999.