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BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

Department Of Energy's Initial Efforts To Implement The Nuclear Waste Policy Act Of 1982

The Nuclear Waste Policy Act of 1982 establishes a comprehensive national program for the safe management, storage, and permanent disposal of highly radioactive materials accumulating at nuclear power plant sites. This report acknowledges progress the Department of Energy (DOE) has made in implementing major initial actions required by the act and discusses difficult challenges facing DOE in (1) meeting statutory schedules for the siting of nuclear waste disposal repositories, (2) assuring adequate program financing, and (3) enhancing management controls over repository planning and execution. Recommendations are made to the Secretary of Energy to reexamine program financing arrangements.



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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

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To the President of the Senate and the
Speaker of the House of Representatives

This report presents the results of our first audit of the Department of Energy's (DOE's) efforts to implement the Nuclear Waste Policy Act of 1982 (42 U.S.C. 10101). The act requires us to report to the Congress the results of an annual audit of the Office of Civilian Radioactive Waste Management (DOE Waste Office)--a new office charged with the responsibility of carrying out the Secretary of Energy's functions under the act. Although the DOE Waste Office was not formally established by the Secretary until October 1983, our first audit covered selected activities of the DOE Waste Office and an interim project office established by the Secretary in January 1983 to implement the act's near-term requirements.

We are sending copies of this report to congressional committees with oversight of DOE's activities; the Director, Office of Management and Budget; the Secretaries of Energy and Treasury; the Chairman of the Nuclear Regulatory Commission; and other interested parties.

Charles A. Bowser
Comptroller General
of the United States



D I G E S T

The Nuclear Waste Policy Act of 1982, enacted in January 1983, established a comprehensive national program for the safe management, storage, and permanent disposal of highly radioactive materials.¹ The act called for the establishment within the Department of Energy (DOE) of the Office of Civilian Radioactive Waste Management (hereafter referred to as the "DOE Waste Office") to develop permanent waste disposal facilities (geologic repositories). The act also requires GAO to report to the Congress the results of an annual audit of the DOE Waste Office.

GAO reviewed DOE's initial efforts to implement the act in three key areas: (1) identifying waste disposal sites (repository siting), (2) financing the waste disposal program through user fees, and (3) establishing an organization to carry out the program.

GAO found that DOE made significant progress in implementing major actions required by the act during 1983. DOE, however, faces a difficult challenge in meeting statutory repository siting deadlines, ensuring adequate financing for the high cost of the program, and enhancing management controls over repository planning and execution. Given the potential for

¹Such materials include the spent nuclear fuel from "commercial" power reactors and high-level radioactive waste resulting from its reprocessing. The act also requires DOE to use one or more of the repositories developed under the act to dispose of high-level radioactive waste resulting from production of nuclear weapons material unless the President finds that a separate repository is required for the disposal of such defense wastes.

earlier collection of millions of dollars in user fees, GAO makes specific recommendations to the Secretary of Energy to reexamine program financing arrangements.

SITING WASTE REPOSITORIES

The act established a step-by-step process for the siting of two geologic repositories. Key statutory milestones/deadlines are shown below.

<u>Statutory milestone</u>	<u>Repository siting statutory deadlines</u>	
	<u>First repository</u>	<u>Second repository</u>
DOE identifies potentially acceptable sites	4/7/83	Not specified
DOE nominates at least 5 sites for further evaluation	Not specified	7/1/89
DOE recommends 3 sites to the President for detailed on-site testing	1/1/85	7/1/89
President recommends 1 site for repository development	3/31/87	3/31/90

The Secretary of Energy, in February 1983, notified the following six states that, for the first repository, DOE had identified locations within their states for further evaluation: Louisiana (1), Mississippi (2), Nevada (1), Texas (2), Utah (2), and Washington (1). The identification of these areas was based on years of investigating three different types of geologic rock formations (basalt, salt, and tuff). (See pp. 12 to 15.)

As part of its efforts to identify sites for a second repository, DOE also notified an additional 17 states that it is gathering and screening data on another type of geologic formation (crystalline rock) within those states. DOE plans to identify potentially acceptable sites for the second repository in the spring of 1986. (See p. 15.)

Completion of siting guidelines

The act required DOE to issue, with the concurrence of the Nuclear Regulatory Commission (NRC), general siting guidelines by July 7, 1983. NRC's concurrence in July 1984 substantially completed the process of developing the siting guidelines and fulfilled a critical program milestone since it allowed DOE to continue with the siting process. DOE will use the guidelines to evaluate the suitability of candidate sites throughout each remaining screening step in the act's siting process. The guidelines, among other things, specify factors that qualify or disqualify any site from development as a repository.

DOE completed the final rulemaking action for incorporating the siting guidelines into the Code of Federal Regulations in December 1984. DOE believes that the importance of full consultation with states, the need for public comment, and the time needed to obtain NRC concurrence on the guidelines have warranted the more than 1-year delay in its development. (See pp. 16 to 20.)

Siting deadlines for the first repository are not expected to be met

DOE does not expect to meet the 1985 and 1987 statutory deadline dates for key decisions in the siting of the first repository.

--Because of "unanticipated complexities" encountered in preparing required environmental evaluations of the potentially acceptable repository sites, DOE will not be in a position to recommend 3 sites to the President for detailed on-site tests until at least mid-1985. (See pp. 20 to 21.) In December 1984, DOE made a preliminary determination to recommend sites in Nevada, Texas, and Washington State. (See p. 10.)

--Because of delays in initiating detailed tests and more recent estimates of the time needed for this testing, DOE estimates that the President would not be in a position to recommend the first repository site until after June 1990. (See pp. 21 to 22.)

FINANCING THE PROGRAM

In July 1984, DOE estimated total program costs over the next 50 years at \$20.9 billion

to \$23.3 billion (in 1983 dollars). Under the act, the "generator or owner" of highly radioactive materials must pay these program costs. To separately account for program receipts and expenditures, the act provided for the establishment of a special trust fund, called the Nuclear Waste Fund. (See pp. 28, 38, and 72.)

Fee payment procedures and disposal contracts set

In April 1983, DOE established payment procedures for collecting two types of fees from commercial generators and owners of spent nuclear fuel. An ongoing fee from utilities was set by the act at an initial rate of 1/10 of a cent per kilowatt-hour of nuclear electricity generated. Under its payment procedures for this fee, DOE expects to collect, on average, about \$80 million every 3 months. (See p. 42.)

DOE also established procedures for collecting a one-time fee from owners of spent nuclear fuel discharged from commercial power reactors in prior years. DOE estimates that these commercial owners owe the Nuclear Waste Fund \$2.3 billion in one-time fees. DOE has given them until June 30, 1985, to select one of three deferred payment options. (See p. 45.)

By June 30, 1983--the deadline imposed by the act for current generators and owners--DOE had entered into an initial 70 contracts with nuclear utilities and other commercial owners of spent fuel. The contracts set forth the specific terms and conditions, as well as the procedures for the collection and payment of fees, under which DOE shall begin to make disposal services available for commercial spent fuel by January 31, 1998--the first repository's scheduled start-up date. In GAO's view, the contracts represent a major step toward placing the financing responsibility for the disposal program on the generators or owners of highly radioactive materials and providing the program an assured source of revenue. (See pp. 29 to 31.)

Increases in the ongoing fee reported likely to be needed

The ongoing fees paid by nuclear utilities are expected to be the major long-term source of

program revenue. Reports issued by DOE and the Congressional Budget Office in the summer of 1984 indicate that increases in the ongoing fee will be needed to account for the effects of inflation, and possibly real cost growth, at some point in the long life of the disposal program. For example, DOE reported that the Nuclear Waste Fund is extremely sensitive to the effects of compound annual inflation. The report noted that the Fund could accumulate deficits through the year 2040 ranging between \$9 billion and \$16 billion at a 5-percent sustained annual inflation rate.

Given the present substantial uncertainty about program cost and revenue projections, DOE has indicated that it will delay any proposal to increase the rate of the ongoing fee until the late 1980's. At that time, DOE expects to have more reliable data on nuclear growth projections and program costs. (See pp. 37 and 38.)

Payment terms need reexamination

GAO believes that, from a sound financial management and equity standpoint, DOE should fully evaluate ways to more promptly collect Nuclear Waste Fund fees from all anticipated repository users. While DOE has established payment procedures to collect fees from commercial generators and owners of spent nuclear fuel, DOE has not yet established fees for the reprocessed high-level wastes (1) produced by DOE defense programs and (2) maintained by New York State. Based on an analysis of DOE's fee collection procedures and/or plans, GAO found that DOE may be able to accelerate millions of dollars in payments from anticipated users of its waste disposal services.

- For utilities generating nuclear electricity, DOE could seek to accelerate payments of ongoing fees by instituting monthly, rather than quarterly, payment periods. (See pp. 42 to 45.)
- For commercial owners of previously discharged spent fuel, DOE could seek to subject deferred payments of one-time fees to commercial, rather than Treasury, interest rates. (See pp. 45 to 49.)
- For defense high-level waste it owns, DOE could seek appropriations to begin payments

in fiscal year 1986 or 1987 if the President does not determine that use of a separate repository for such defense waste is required. (See pp. 49 to 52.)

--For high-level waste maintained by New York State, DOE could seek prompt payments of funds held by the state for the care of such waste under contractual arrangements which pre-date the Nuclear Waste Policy Act. (See pp. 52 to 53.)

Each method of accelerating payment, however, has obstacles or concerns that DOE would need to address. For example, DOE would need to decide what is an appropriate fee to charge for disposing of high-level wastes, seek appropriations to pay fees for disposing of defense high-level wastes, and amend its contractual agreements with utilities and New York State. (See pp. 43, 44, 48, 51, and 53.)

GAO recommendations

Given the potential for accelerating millions of dollars in payments into the Nuclear Waste Fund, GAO recommends that the Secretary of Energy evaluate ways to more promptly collect fees from all generators and owners of highly radioactive materials and to establish fees for disposing of high-level wastes. (See p. 53.)

ESTABLISHING AN ORGANIZATION TO CARRY OUT DOE'S FUNCTIONS

Calendar year 1983 was a difficult transition period for DOE's nuclear waste management program. DOE had to restructure its organizational responsibilities to put the Waste Office in place to carry out the various functions under the act. At the same time, DOE had to begin implementing the act's requirements. DOE formally activated the Waste Office as a permanent headquarters organization in October 1983. Until then, an interim project office was responsible for implementing the act's near-term requirements. In addition, the DOE Waste Office was headed by two different acting directors until the appointment of a permanent director in May 1984. (See pp. 55 to 62.)

GAO found that under DOE's decentralized field management approach the DOE Waste Office lacks

direct authority to control the field staffs that execute the program through a multitude of contractors. In this situation, GAO believes that the DOE Waste Office will need to pay particularly close attention to developing strong management controls over repository planning and execution, given the high cost of repository development, the tight development schedule, and DOE contractual commitments with nuclear-electric utilities.

The DOE Waste Office recognizes the importance of this consideration and has taken actions to strengthen its controls over repository planning and execution. For example, beginning in fiscal year 1985, DOE will have integrated its financial accounting and budgeting system with its project management control system. This should result in the routine collection of more detailed cost data on program subactivities. (See pp. 63 to 66.)

AGENCY COMMENTS

DOE believes that the report presents a fair and balanced assessment of its progress in implementing the act. DOE commented that it is (1) in the process of developing an integrated program management system, (2) exploring alternatives to improve the program's revenue stream, and (3) studying GAO's recommendations and suggestions. The Department of the Treasury strongly supports applying commercial, rather than Treasury, interest rates to deferred payments of one-time fees. (See p. 54, app. VII, and app. VIII.)

DOE and NRC also provided specific comments aimed at enhancing the accuracy and clarity of the report. Where appropriate, the report was revised to recognize their positions on certain matters. (See p. 14.)

Also, GAO discussed its analysis of ways DOE may be able to accelerate payment of fees into the Nuclear Waste Fund with representatives of investor-owned nuclear utilities and the New York State Energy Research and Development Authority. Utility representatives told GAO that utilities would oppose amending their contracts to require payment of fees on a monthly, rather than quarterly, basis. They stated that such an amendment would result in additional cost which would be passed on to utility customers.



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ABBREVIATIONS

CBO	Congressional Budget Office
EIA	Energy Information Administration
EPA	Environmental Protection Agency
GAO	General Accounting Office
NRC	Nuclear Regulatory Commission
NWF	Nuclear Waste Fund
NWPA	Nuclear Waste Policy Act of 1982
OCRWM	Office of Civilian Radioactive Waste Management
OMB	Office of Management and Budget
OTA	Office of Technology Assessment



CHAPTER 1

INTRODUCTION

Highly radioactive materials are accumulating at nuclear power plant sites and other temporary storage areas throughout the United States. These materials, which remain potentially hazardous for hundreds to millions of years, must be isolated from the environment until their radioactivity decays to levels that will pose no significant threat to people or the environment. The lack of a demonstrated capability to permanently dispose of these materials has been a frequently cited obstacle to the continued use of nuclear power as a major energy source.

To provide the necessary disposal facilities and establish a definite federal policy, the Congress enacted the Nuclear Waste Policy Act of 1982 (NWPA). The act represents the culmination of 25 years of legislative effort to establish a comprehensive national program for the safe management, storage, and permanent (geologic) disposal of highly radioactive materials. The act also requires the Comptroller General to annually audit the efforts of the Department of Energy (DOE) to carry out the act. This report presents the results of our first annual audit.

DESCRIPTION AND LOCATION OF HIGHLY RADIOACTIVE MATERIALS REQUIRING GEOLOGIC DISPOSAL

Generally, highly radioactive materials consist of (1) spent nuclear fuel¹ from commercial reactors used for the production of electricity and (2) high-level wastes (either liquid or solid) remaining from the reprocessing² of spent nuclear fuel from commercial reactors, or from the defense reactors used for the production of nuclear weapons material. Both types of material are extremely difficult to dispose of because of their high toxicity and long radioactive life. In addition, they produce heat, which complicates their safe disposal.

Commercial spent fuel is currently stored in water-filled pools at the sites of nuclear power reactors. Inventories of spent fuel are expected to grow rapidly. For example, the Energy Information Administration in September 1983 estimated that the 9,000 metric tons of spent fuel discharged from nuclear power reactors up to the end of calendar year 1982 will double by 1989, triple by 1992, and quadruple by 1996. By 2020, almost 15 times more spent fuel could be discharged than in 1982.

¹Spent nuclear fuel is the used uranium fuel that has been removed from a nuclear reactor.

²Reprocessing is a chemical process to dissolve spent fuel elements to recover unused uranium and plutonium. The chemical solution remaining from this process is high-level liquid waste.

In contrast, high-level wastes are currently stored in hundreds of large tanks, bins, or capsules at the sites of three federal reprocessing installations³ and one state-owned site⁴ in a variety of different physical forms, including liquid and sludge. Before this waste can be transported to a permanent repository, it must be put into a suitable solid form. To begin this process, DOE is constructing a facility that will convert the high-level waste at its Savannah River plant into a solid glass form. This facility is scheduled to begin operation in 1989, and its glass product represents the first high-level waste expected to be in a form ready for geologic disposal.

Federal policies toward disposal vs.
storage of highly radioactive materials

Federal policies have shifted frequently over the years and contributed to deteriorating public confidence in the government's ability to safely manage highly radioactive materials. In the 1950's and 1960's, tank storage was viewed as a possible final approach to managing high-level waste. However, questions arose about the cost and safety of this approach, and the former Atomic Energy Commission looked for alternative technical solutions. In the mid-1960's, the Commission also tried to develop an underground geologic disposal facility at Lyons, Kansas. Plans to develop this facility were abandoned in 1972 following questions concerning the site's ability to safely contain waste. The Commission next proposed storage of high-level waste in retrievable surface storage facilities until geologic disposal received greater public acceptance. Since withdrawal of a proposed congressional authorization for such storage facilities in 1975, federal activity has concentrated primarily on the development of mined geologic repositories with interim storage of spent fuel to be provided by the generators.⁵

In May 1981, DOE selected mined geologic repositories as the preferred means for disposal of highly radioactive materials. This decision was made after DOE had evaluated various alternative

³These three sites are the Hanford Reservation in Washington, the Idaho National Engineering Laboratory in Idaho, and the Savannah River Plant in South Carolina.

⁴Western New York Nuclear Service Center in West Valley, New York. This high-level waste resulted from a commercial reprocessing plant at the site which operated from 1966 to 1972. New York State subsequently assumed responsibility for the wastes.

⁵An exception occurred in 1977 when President Carter proposed government-owned, away-from-reactor spent fuel storage which utilities would pay for, but the Congress did not pass the necessary enabling legislation.

means and issued an environmental impact statement. The materials would be emplaced in stable geologic rock formations 1,100 to 4,000 feet below ground. Without relying on human monitoring and maintenance, such geologic repositories are intended to provide long-term isolation of these materials to prevent radioactivity from entering the environment. In August 1984, the Nuclear Regulatory Commission (NRC) completed a rulemaking proceeding,⁶ which found, among other things, reasonable assurance that safe disposal of highly radioactive materials from nuclear power reactors in a mined geologic repository is technically feasible.

THE NUCLEAR WASTE
POLICY ACT OF 1982

NWPA was passed in the closing days of the 97th Congress and signed into law by the President on January 7, 1983.⁷ In NWPA, the Congress recognized that ". . . Federal efforts during the past 30 years to devise a permanent solution to the problems of civilian radioactive waste disposal have not been adequate."

To provide the facilities for the permanent disposal of both spent nuclear fuel and high-level radioactive wastes, the act established

- a tight schedule for the siting of two geologic repositories and the construction and operation of the first repository,
- special financing arrangements,
- a planning and development process that includes state and public participation, and
- a definite federal policy and responsibility for the permanent disposal of these materials.

NWPA does not distinguish between spent nuclear fuel and high-level radioactive wastes for purposes of developing geologic repositories. It would permit the permanent disposal in geologic repositories of both unprocessed spent fuel and the high-level wastes resulting from reprocessing spent fuel. However, because there are no firm industry plans for commercial reprocessing, spent fuel is the predominant commercial waste form available for disposal in a repository.

⁶This rulemaking was initiated by NRC in October 1979 and has become known as the "Waste Confidence Rulemaking." NRC's final decision was published in the Federal Register on August 31, 1984 (49 Fed. Reg. 34658).

⁷Public Law 97-425, 96 Stat. 2201, 42 U.S.C. 10101 et seq.

A final decision has not yet been made on whether high-level radioactive wastes resulting from DOE reprocessing of spent fuel from defense reactors will be disposed of in a geologic repository developed under NWPA. NWPA requires the President to evaluate this issue by January 1985. Unless the President finds that a defense-only repository is required, NWPA requires DOE to proceed promptly with arrangements to dispose of both commercial and defense materials in the same repository.

Two special trust funds are established by the act: (1) an Interim Storage Fund to be financed by utilities which have been certified by NRC as requiring federal storage assistance prior to the availability of a repository and (2) a Nuclear Waste Fund to be financed by the owners and generators of spent fuel and high-level wastes for the permanent federal disposal of these materials. During 1983, the Interim Storage Fund was inoperative since no utilities have requested federal interim storage assistance. The Nuclear Waste Fund received \$73.6 million in fees from utilities during the fourth quarter of fiscal year 1983.

NWPA authorized DOE to enter into contracts with utilities to provide for federal disposal services. The act required utilities to enter into such a contract with DOE by (1) June 30, 1983, or (2) the date the utility begins generation of such spent fuel, whichever occurs later. In return for payment of fees into the Nuclear Waste Fund, the act requires the contracts to provide for DOE disposal of utility spent fuel beginning not later than January 31, 1998.

DOE believes the act's general contracting authorization gives it the necessary authority to accept spent fuel beginning January 31, 1998, even in the event a repository is not fully operational by that date. In September 1984, the Secretary of Energy noted that DOE plans to incorporate provisions into the contracts which specify the minimum amount of spent fuel DOE will be obligated to accept by January 31, 1998. According to the Secretary of Energy, this should enable utilities to plan for their projected disposal needs with confidence and certainty.

While the development of geologic repositories is the primary focus of NWPA, the act provides, as shown in the table on the next page, for the development of five separate facilities. In July 1984, DOE estimated that it could cost up to \$23.3 billion (in 1983 dollars) to provide the repository facilities and related services. NWPA requires that expenditures for these activities be subject to annual congressional appropriations and triennial authorizations. DOE has decided to prepare and submit to the Congress a triennial budget each year to satisfy both authorization and appropriations requirements.

Facilities Provided for in NWPA

<u>Facility</u>	<u>Activities authorized</u>	<u>Funding source</u>
First repository	Study, siting and design, construction, ^a and operation	Nuclear Waste Fund
Second repository	Study, siting, and design	Nuclear Waste Fund
Test and evaluation facility ^b	Study, siting, and design, construction, operation, and termination	Nuclear Waste Fund
Interim storage facility ^c	Study, acquisition of mobile equipment, siting, construction, and operation	Interim Storage Fund
Monitored retrievable storage ^d	Study, siting, and design	Nuclear Waste Fund

^aConstruction authorization is subject to approval by NRC of a DOE license application.

^bNWPA authorizes, but does not require, DOE to develop a test and evaluation facility to carry out research and provide an integrated demonstration of the deep geologic disposal of highly radioactive material.

^cThe federal government is limited to providing only 1,900 metric tons of interim storage capacity. Such capacity can be provided only if NRC finds that adequate storage capacity cannot reasonably be provided by a utility applying for federal assistance and that the utility is diligently pursuing licensed alternatives to the use of federal storage capacity.

^dThe Secretary must recommend whether or not such a facility will be needed by June 1, 1985. Actual construction and operation of such a facility must be authorized by the Congress after its review of the Secretary's proposal.

Responsibilities of federal agencies under NWPA

DOE has overall responsibility for implementing NWPA through its Office of Civilian Radioactive Waste Management (OCRWM) which was established by the act. OCRWM is specifically responsible for providing the federal facilities and related services, such as transportation, called for by the act. In addition, OCRWM is responsible for administering the two special trust funds.

Appendix I presents a summary of DOE's first triennial budget for OCRWM activities under NWPA.⁸ For fiscal years 1985 to 1987, DOE has requested about \$1.4 billion in appropriations, of which the Congress appropriated \$355.3 million for OCRWM activities in fiscal year 1985. Fees paid into the Nuclear Waste Fund by utilities are expected to account for about 92 percent of OCRWM-budgeted program expenditures in fiscal year 1985.

Although DOE has the lead responsibility for NWPA, several other federal agencies--especially the Environmental Protection Agency (EPA) and NRC--have crucial supporting roles. EPA is responsible for setting standards for protection of the general environment from release of radioactive material beyond the boundaries of a repository site (sec. 121(a)). NRC is responsible for authorizing repository construction (sec. 114(b)) and for setting specific technical requirements and criteria, consistent with the EPA standards, that DOE must meet before NRC authorizes construction (sec. 121(b)).

NRC has many additional responsibilities under NWPA, some of which are noted below. The act requires NRC to approve or disapprove construction of a repository within 3 years of a DOE license application. (NRC may extend the deadline by another year if it reports to DOE and the Congress its reasons for doing so.) NRC is required to concur with certain DOE implementing actions and to review others: namely, the issuance of general guidelines for the siting of repositories (sec. 112(a)) and planning, construction, and operation of a test and evaluation facility (sec. 217(f)).

In addition, NWPA requires NRC and DOE to share responsibilities for some activities. Both DOE and NRC are required to (1) encourage and expedite the effective use of spent fuel storage space at the site of each civilian nuclear power reactor (sec. 132) and (2) cooperate and provide technical assistance on spent fuel storage and disposal to certain foreign governments (sec. 223(b)(1)).

In commenting on a draft of this report, NRC stated that it has other responsibilities mandated by NWPA. NRC suggested we note that after construction authorization NRC has a continuing responsibility to see that, among other things, the repository is constructed according to the approved design, a license to emplace

⁸OCRWM activities are divided into two budget categories: the Nuclear Waste Fund and Civilian Radioactive Waste Research and Development. The latter budget category includes activities, such as research on spent fuel storage technologies, which are financed directly by the government through appropriations. While the Nuclear Waste Fund is financed by utilities, DOE cannot expend the funds until it receives specific congressional approval through the appropriations process.

wastes can be issued without unreasonable risk to public health and safety, the facility can be operated in a manner that protects workers, and the facility can be adequately decommissioned and closed. In addition, NRC noted it is also responsible for licensing and regulating a separate repository for defense high-level wastes in the event the administration determines a separate defense waste repository is required, and it is authorized by the Congress.

Other agencies have important but specifically limited supporting responsibilities. For example:

- DOE is required to consult with the Council on Environmental Quality and Director of the Geological Survey on the issuance of general guidelines for repository siting (sec. 112).
- The Department of the Interior is responsible for determining whether an Indian tribe's possessory or usage rights to lands outside its reservation's boundaries are "affected" by NWPA activities (sec. 2(2)(B)).
- The Department of the Treasury is responsible for annually reporting to the Congress on the financial condition and operations of the Nuclear Waste Fund and Interim Storage Fund (sec. 302 and sec. 136).

Federal/state/Indian relations under NWPA

The Congress stated in NWPA that ". . . State and public participation in the planning and development of repositories is essential in order to promote public confidence in the safety of disposal of such waste and spent fuel" Interwoven throughout NWPA are provisions for states, local government, and Indian tribes, along with the general public, to participate in major DOE decisions. For example, DOE is required to "consult and cooperate" with affected states and Indian tribes in making repository siting decisions, including entering into binding written agreements which establish procedures for resolving their concerns (sec. 117) and providing certain financial and technical assistance (sec. 116 and sec. 118). Perhaps most importantly, a state or Indian tribe may submit to the Congress a notice of disapproval of the selection of a repository site within its boundaries (sec. 116 and sec. 118). The site will be considered disapproved unless the Congress, within 90 days of receipt of the notice of disapproval, passes a joint resolution approving the site.

OBJECTIVES, SCOPE, AND METHODOLOGY

Section 304(d) of NWPA requires the Comptroller General to report to the Congress the results of an annual audit of DOE's

Office of Civilian Radioactive Waste Management. DOE did not formally establish this office until October 1983. In January 1983, however, DOE established an interim project office to carry out DOE's near-term requirements under the act. Thus, our first audit covered the activities of both the interim project office and OCRWM.

Our review focused on DOE's progress in laying the groundwork for successful implementation of the act in the three key areas of

- repository siting (see ch. 2),
- program financing (see ch. 3), and
- program organization and staffing (see ch. 4).

In each of these areas, our objective was to determine the status of DOE's progress in implementing major actions required by NWA during calendar year 1983. Descriptions of the status of most DOE implementing actions were updated to reflect DOE's schedules as of early September 1984 and, in some instances where noted, as of early December 1984. We reviewed DOE and contractor documents, public comments, and testimony from interested parties and interviewed representatives of federal, state, and other organizations. (See app. II.)

In the repository siting area, we focused on two initial DOE implementing actions--identification of states with one or more potentially acceptable repository sites and the issuance of general repository siting guidelines. We reviewed how DOE selected nine potentially acceptable sites in six states to begin the NWA siting process for the first geologic repository and monitored DOE's efforts to prepare and issue final siting guidelines. DOE issued the siting guidelines in final form in December 1984 after receiving NRC's concurrence in July 1984. While we monitored DOE's progress in preparing the guidelines, we did not evaluate the adequacy of DOE and NRC efforts to resolve concerns about the siting guidelines raised by states, Indian tribes, and members of the public. In addition, we identified DOE plans to meet future statutory siting deadlines for the first repository and identified certain matters which might affect timely completion of DOE's repository siting activities. We did not attempt to evaluate how DOE should address these matters but wanted to alert the Congress of those potential repository siting problem areas.

In the program financing area, we focused on initial DOE implementing actions to establish arrangements for the payment of fees into the Nuclear Waste Fund. To determine how the Fund was set up, we reviewed the procedures DOE used to transfer fiscal year 1983 appropriations into the Fund and how DOE plans to account for receipts and expenditures for authorized activities. (See app. IV.) We did not conduct a financial audit of the Fund. DOE was in the process of obtaining a public accounting firm audit during our review. To determine how DOE complied with the act's provisions requiring generators or owners of highly radioactive

materials to pay the costs of geologic disposal, we reviewed (1) the standard contract DOE published in the Federal Register on April 18, 1983, and (2) the procedures DOE established for collection and payment of fees for four categories of generators or owners. For each category, we reviewed DOE's fee collection procedures or plans to determine when and how payments would be made.

In the program organization and staffing area, we focused on DOE's efforts to put in place a separate, permanent organization to carry out NWPA. We reviewed how DOE established OCRWM at headquarters and its relationship to DOE's pre-existing field organization and contractor activities. In addition, we determined how DOE allocated initial staffing authorizations and the status of DOE efforts, as of February 1984, to assign full-time staff to carry out DOE responsibilities under the act. We relied mainly on DOE documents and interviews for this information. We also relied on our past work¹⁰ in evaluating DOE's headquarters/field structure Department-wide for insights into how improvements could be made in the OCRWM/field structure.

Our work was performed in accordance with generally accepted government auditing standards.

Past reports of other legislative agencies

In the preparation of this report, we also relied on information presented in reports prepared by the Office of Technology Assessment (OTA) and the Congressional Budget Office (CBO). Specifically, OTA issued a report¹¹ in April 1982 that addressed the major policy issues which faced the Congress in its deliberations on nuclear waste policy legislation. We found this report particularly useful in providing us a perspective of the broad policy concerns involved in DOE's implementation of the entire act. A CBO report¹² issued in September 1982 was useful for obtaining insights into the key variables affecting the establishment of fees required to finance the waste disposal program. In addition, we relied on a more recent CBO report,¹³ completed in August 1984, for information on the adequacy of the initial fee set by NWPA and now charged nuclear-electricity consumers.

¹⁰A New Headquarters/Field Structure Could Provide a Better Framework for Improving Department of Energy Operations (EMD-81-97, Sept. 3, 1981).

¹¹Managing Commercial High-Level Radioactive Waste, Summary Report, OTA, Apr. 1982.

¹²Financing Radioactive Waste Disposal, CBO, Sept. 1982.

¹³Nuclear Waste Disposal: Achieving Adequate Financing, CBO, Aug. 1984.

Additional scope limitations

Although we gathered information on all aspects of DOE's implementation of NWPA, we did not conduct a comprehensive evaluation of all DOE's implementation efforts. For example, this report does not address DOE's overall strategy and plans for carrying out the act because they are still under development and thus subject to substantial revision. In addition, the report does not address other DOE programmatic activities, such as DOE consideration of the need and timing for constructing a test and evaluation facility or providing federal storage of utility spent nuclear fuel. Depending on DOE implementing actions, these activities will be covered in future reports to the Congress and/or quarterly reports to the Senate Energy and Natural Resources Committee.¹⁴

We limited advance review and comment of this report to the primary federal agencies with administrative responsibilities for matters discussed in the report--DOE, NRC, and the Treasury. (See apps. VII, VIII, and IX.) Major agency comments regarding program financing are summarized at the end of chapter 3. Specific agency comments of a technical or clarifying nature are presented in the text of the report where appropriate. Also, we discussed our analysis of ways DOE may be able to accelerate payment of fees into the Nuclear Waste Fund from nuclear utilities and New York State with representatives of investor-owned nuclear utilities and the New York State Energy Research and Development Authority. Their comments were recognized as appropriate in the report.

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As we were finalizing this report, DOE announced on December 19, 1984, that as part of its efforts to locate an acceptable site for a geologic waste repository, DOE had made a preliminary determination to recommend to the President three sites in Nevada, Texas, and Washington State for detailed on-site tests. The three sites are: Yucca Mountain in Nevada; Deaf Smith in Texas; and the Cold Creek Syncline (Hanford) in Washington. The evaluations which form the basis for DOE's preliminary determination are subject to a 90-day public comment period before being finalized and before the Secretary of Energy makes a formal recommendation to the President. Events leading up to DOE's preliminary determination are discussed in the next chapter. Subsequent events will be discussed in our future reports to the Congress and/or Senate Energy and Natural Resources Committee.

¹⁴In March 1984, the Senate Energy Committee requested that GAO report on a quarterly basis the status of DOE's progress in implementing the NWPA. Our first report to the Committee was issued on October 19, 1984 (GAO/RCED-85-42), and covers selected activities that occurred from July through September 1984.

CHAPTER 2

DOE's EFFORTS TO LOCATE AN ACCEPTABLE

SITE FOR A GEOLOGIC WASTE REPOSITORY

The Nuclear Waste Policy Act of 1982 establishes the federal government's responsibility for the geologic disposal of high-level radioactive waste and spent nuclear fuel in order to protect (1) the public's health and safety and (2) the environment. As first steps toward locating an acceptable first repository site, the act required DOE, in calendar year 1983, to

- identify by April 7, 1983, the states with one or more potentially acceptable repository sites and notify the governor, state legislature, and affected Indian tribes in such states by July 7, 1983 (sec. 116), and
- issue by July 7, 1983, general siting guidelines¹ which are to be used as a basis for recommending repository sites (sec. 112).

In February 1983, DOE formally identified nine candidate sites in six states for a first repository and notified appropriate state officials. It has been studying these locations to evaluate which of them are suitable for permanent waste disposal. In addition, DOE has notified an additional 17 states that it is making preliminary studies of geologic formations within those states for a second repository.

DOE issued the general siting guidelines in final form in December 1984, 17 months after the statutory deadline date. DOE believes that the importance of full consultation with states, the need for public comment, and the time needed to obtain NRC concurrence on the guidelines warranted the delay in its development. The act required DOE to obtain NRC's concurrence on the final guidelines and to consult with other federal agencies and interested governors.

Obtaining NRC's concurrence on the guidelines in July 1984 fulfilled a critical program milestone since it allowed DOE to conduct the required evaluations of potentially acceptable repository sites. When the evaluations are completed, DOE can nominate at least five sites for further study and then recommend three sites to the President for detailed testing. Given the preparatory work done on these evaluations, DOE had expected to meet the January 1, 1985, statutory deadline for recommending three sites. However, OCRWM officials told us early in October 1984 that, due

¹Guidelines that specify the various geologic conditions and other factors that would qualify or disqualify any site from development as a repository.

to unanticipated complexities involved in preparing the required evaluations of the nine sites, DOE will not be in a position to recommend three sites to the President until at least mid-1985. In addition, DOE has acknowledged that the statutory milestone requiring the President to recommend the first repository site to the Congress by March 1987 will not be met until at least June 1990 because of the time needed to conduct a thorough site-testing program.

Moreover, we noted several additional matters that could further affect DOE's ability to timely complete repository siting activities. These relate to concerns by DOE and others about the effects on DOE's schedule of difficulties in obtaining state permits, litigation, and challenges to the quality of siting data.

DOE IDENTIFIED NINE POTENTIALLY ACCEPTABLE SITES FOR THE FIRST REPOSITORY

In February 1983, the Secretary of Energy notified the governors² of six states that DOE was considering nine sites within their states for possible construction of a nuclear waste repository. These sites are listed in the table on the next page.

The identification of these sites was based on years of investigation of geologic formations for the safe disposal of nuclear waste. For example, federal agencies have been studying bedded salt for possible underground waste disposal since the late 1950's. As a result, DOE was in a position to meet the act's time frame of identifying sites by April 7, 1983.

Screening process used to identify nine sites

The screening process DOE used to identify the nine potentially acceptable sites varied. A geologic screening process was used in selecting salt formations. The Nevada and Washington sites were initially identified because of their locations on federal land and DOE's long-term presence at these sites for nuclear weapons work. Further screening was based primarily on evaluations of geologic and hydrologic suitability, according to DOE.

²The legislatures of five states were also notified at this time. However, Nevada's legislature was not notified until March 25, 1983, because DOE had not known the appropriate individuals to contact. Three Indian tribes--the Yakima Indian Nation, the Confederated Tribes of the Umatilla Indian Reservation, and Nez Perce Indian Tribe--were notified following the Interior Department's designation of them as affected Indian tribes.

Potentially Acceptable Sites for
the First Repository

<u>Site</u>	<u>State</u>	<u>Geologic media host rock</u>
1. Yucca Mountain	Nevada	Tuff ^a
2. Cold Creek Syncline	Washington	Basalt ^b
3. Deaf Smith County	Texas	Bedded ^c salt
4. Swisher County	Texas	Bedded salt
5. Davis Canyon	Utah	Bedded salt
6. Lavender Canyon	Utah	Bedded salt
7. Vacherie Dome	Louisiana	Domed salt ^d
8. Cypress Creek Dome	Mississippi	Domed salt
9. Richton Dome	Mississippi	Domed salt

^aTuff is a rock formed from volcanic fragments.

^bBasalt is a fine-grained solid lava.

^cBedded salt is salt deposits laid down in layers or beds.

^dDomed salt is individual pillars of salt formed when deeply buried, bedded salt was forced upward.

The screening process DOE was using to identify salt sites prior to enactment of NWPA generally involved a series of increasingly detailed studies of narrower land areas. The steps in the process consisted of

- (1) a national survey of one or more rock types with potential for waste containment,

- (2) identification of regions (which may include parts of several states) containing potentially suitable rock types,
- (3) recommendation of areas (1,000 or more square miles) and locations (tens of square miles), and
- (4) surveys of the locations narrowing them to sites (less than about 10 square miles).

According to DOE's major contractor for this process,

"At the conclusion of each screening step, the focus of studies narrows to smaller land areas, while the amount of data collected increases The types of information DOE obtained at each step in the site screening process are similar, but the amount and quantity increase as the focus narrows and the data become more specific to the region, area, location, or site. In the national survey and regional studies, data are obtained from published literature and other public sources. At the area, location, and site steps, data are obtained from regional and local experts and institutions."³

A discussion of how DOE's screening process specifically worked in each of the six affected states follows.

--Nevada. Early repository explorations at the Nevada Test Site⁴ concentrated on evaluating the suitability of granite and argillite⁵ formations. DOE had to determine that having repositories in these rocks would not interfere with nuclear weapons testing. In 1978, DOE decided that it could use the southwestern portion of the test site as a repository, but preferred a different type of rock formation. DOE then concentrated its testing on the tuff formations at Yucca Mountain and proposed that site.

³Isolating High-Level Nuclear Waste, Office of Nuclear Waste Isolation, Battelle Memorial Institute, Columbus, Ohio (June 1982).

⁴The Nevada Test Site, established in 1950, contains 1,350 square miles of federally owned land in southern Nevada. The site was established as a remote, secure facility for the conduct of underground nuclear weapons testing.

⁵Argillite is a clayey rock cemented by silica.

- Washington. Basalt has been under study at DOE's Hanford Reservation⁶ since 1968. Initial explorations identified 10 possible repository sites in the central part of the reservation and in 1980 DOE identified one of these sites for further investigation. Site-specific work, including borehole drilling and seismic monitoring, has been ongoing at the Cold Creek Syncline since 1981.
- Texas. Regional studies of the Permian Basin identified two bedded-salt areas in northern Texas for further study. Detailed area studies began in fiscal year 1980. In 1982, DOE identified two northern Texas locations in Deaf Smith and Swisher Counties for further evaluation.
- Utah. In 1977-78, DOE studied the regional geology of Utah's Paradox Basin and then evaluated four bedded-salt areas within this basin. Of these, DOE further evaluated the Gibson Dome and Elk Ridge areas. In 1982, two candidate site locations in the Gibson Dome area, Davis and Lavender canyons, were identified for more intensive study.
- Louisiana and Mississippi. A 1963 U.S. Geological Survey evaluation of 263 salt domes identified 36 domes in eastern Texas, northern Louisiana, and southern Mississippi for additional study. After selecting eight salt domes for area studies, DOE identified the Richton and Cypress Creek Domes in Mississippi and the Vacherie Dome in Louisiana for further study in 1982.

DOE's siting activities for a second repository focusing on 17 states

NWPA authorizes the construction of only one repository but directs the Secretary of Energy to conduct siting and design evaluations for selection of a second repository (sec. 112). The act requires the Secretary to recommend to the President three candidate sites for detailed testing by July 1, 1989.

DOE plans to identify potentially acceptable sites for the second repository in the spring of 1986. As part of its siting efforts for the second repository, DOE completed in 1983 a national survey of geologic literature on crystalline rocks.⁷ This survey was initiated in 1979, in response to recommendations

⁶The Hanford Reservation is a 560-square-mile DOE nuclear research, engineering, and test site. It was established in 1943 and is located in southeastern Washington State.

⁷Crystalline rock is a general term used for igneous and metamorphic rocks. Granite is one type of crystalline rock which DOE is investigating.

by an interagency review group on nuclear waste management, and resulted in the recommendation that further study be conducted to investigate crystalline rock formations in three geographic regions. These regions include parts of 17 states as follows: Northeastern Region (Connecticut, Pennsylvania, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont); North Central Region (Michigan, Minnesota, and Wisconsin); and Southeastern Region (Georgia, Maryland, North Carolina, South Carolina, and Virginia). These states have been notified that DOE is undertaking further screening studies of crystalline rock formations within their boundaries. DOE has not conducted field studies in these states and does not plan to do so until the summer of 1986.

The screening process is currently in the regional phase. This phase involves compiling information from open literature on the geology and the environment of each region. DOE had intended to finalize reports, issued in draft in May 1983, on the regional phase after state review and use them as the basis for recommending areas for field investigations. However, because of comments received on the draft reports and comments submitted by states on the siting guidelines, DOE is in the process of developing a screening methodology to identify specific areas within the three regions in which to conduct field investigations. DOE expects to complete development of this screening methodology in late December 1984 and issue the final regional reports by the spring of 1985.

COMPLETION OF SITING GUIDELINES
FULFILLS A CRITICAL PROGRAM MILESTONE

NWPA required DOE to issue the siting guidelines by July 7, 1983 (sec. 112). These guidelines are to be used by the Secretary as the primary criteria in evaluating the suitability of sites for repositories during the screening process. The act required DOE to obtain the concurrence of NRC on the final guidelines as well as to consult with the Council on Environmental Quality, EPA, the Geological Survey, and interested governors.

In December 1984, DOE completed the final rulemaking action for incorporating the siting guidelines into the Code of Federal Regulations at 10 CFR Part 960. DOE believes that the importance of full consultation with states, the need for public comment, and the time needed to obtain NRC concurrence on the guidelines warranted the more than 1-year delay in its development. Obtaining NRC's concurrence in July 1984, however, fulfilled a critical program milestone since it allowed DOE to conduct the evaluations of the nine potentially acceptable repository sites needed to nominate at least five sites and recommend three sites to the President for detailed testing.

DOE's initial efforts
to develop siting guidelines

On February 7, 1983, DOE published draft siting guidelines. It mailed copies of the proposed guidelines to over 4,000 individuals and organizations. During the public comment period, DOE participated in a program of public consultation, which included receiving written comments, conducting public hearings at five locations throughout the country, presenting briefings to affected and interested states, and consulting the Council on Environmental Quality, EPA, the Geological Survey and other federal agencies. Following this initial consultation period, a DOE task force evaluated and responded to the nearly 2,000 comments received.

DOE's basic approach was to develop general, qualitative guidelines as a basis for comparing sites, rather than specific quantitative criteria or numerical limits that a site must meet to be acceptable. DOE received comments on all aspects of its proposed guidelines, and many comments were highly specific. DOE received the most comments on its technical guidelines on geology and related topics, as well as many general comments on the development of the guidelines and their application.

With respect to comments from federal agencies and states, EPA believed the guidelines would provide a sound framework for site selection but made several suggestions on ranking the guidelines and providing greater detail in technical areas. The Geological Survey was in general agreement with DOE's proposed guidelines and approach. The Council on Environmental Quality requested briefings to discuss revisions to the guidelines but provided no specific suggested changes. Interested states also submitted comments or participated in public hearings. In response to the numerous comments received, DOE reorganized the guidelines to clarify their intent, application, and possible use. In addition, DOE made changes to individual guidelines in response to specific comments.

On May 27, 1983, DOE issued revised draft siting guidelines. The revised draft guidelines were subsequently sent to states and federal agencies and made available to the public for comment. DOE received about 900 comments on this version of the guidelines.

In July 1983, DOE formally notified the congressional committees with departmental jurisdiction that the issuance of final siting guidelines would be delayed. DOE stated that due to the large volume and the complexity of the comments it received on the proposed guidelines, considerably more time would be necessary for DOE to review and adequately consider all the comments. Moreover, DOE stated that its discussions with interested states and federal agencies further demonstrated the need for additional consultation time to address and, if possible, to resolve the questions and concerns noted in their comments.

NRC concurrence process

DOE's proposed guidelines were sent formally to NRC for concurrence on November 22, 1983. According to NRC, its concurrence process was actually initiated shortly after DOE published the first version of the proposed guidelines in February 1983. In April 1983, the NRC staff provided DOE comments on this first version and made arrangements for DOE to provide them for independent review all comments DOE received on the guidelines. Following requests from several states and the Yakima Indian Nation, NRC provided opportunities for those who filed comments with DOE to present to NRC oral and written comments on the November proposed guidelines.

On March 14, 1984, NRC issued a preliminary decision requesting satisfactory resolution of seven conditions prior to concurring in the guidelines.⁸ As the basis for making this decision, the criteria NRC developed specified that the siting guidelines must not

- be in conflict with NRC's regulations for licensing the disposal of high-level waste in geologic repositories,
- contain provisions that might lead DOE to select sites that would not be reasonable alternatives for an environmental impact statement, and
- contain provisions that are in conflict with NRC responsibilities as embodied in NWPA.

On May 14, 1984, after NRC staff and DOE met in six public meetings in an effort to satisfy NRC's concurrence conditions, DOE submitted revised proposed siting guidelines for NRC's consideration. At this time, DOE urged NRC to expedite its concurrence process because, in DOE's view, the final issuance of the guidelines had become a critical milestone in the program. A day later, on May 15, the House Committee on Appropriations expressed concerns about the delays in the NRC concurrence process and directed NRC ". . . to take prompt action to resolve any remaining

⁸These seven conditions required DOE to (1) recognize the NRC's jurisdiction over the resolution of differences between the guidelines and NRC's repository licensing regulations (10 CFR Part 60), (2) commit to obtain NRC concurrence on guideline revisions relating to NRC jurisdiction, (3) make a number of specific revisions to the guidelines to enhance consistency between the guidelines and 10 CFR Part 60, (4) state more clearly that engineered barriers will not be used to compensate for site deficiencies, (5) specify in detail how the guidelines would be applied at each siting stage, (6) indicate, guideline by guideline, the kinds of levels of information necessary to make siting decisions, and (7) add more disqualifying conditions to the guidelines.

issues so that the guidelines can be finalized to avoid any further delays."⁹

On July 3, 1984, NRC formally granted its final concurrence after DOE agreed to make several clarifying revisions to the guidelines requested by Commission members in a June 22, 1984, meeting. NRC found that DOE had satisfactorily resolved NRC's seven concurrence conditions. Any DOE revisions to, or interpretations of, the guidelines are expected to be submitted to NRC for its review and concurrence.

How DOE's guidelines will be applied

Generally, the guidelines are divided into four parts: (a) general provisions, (b) implementation guidelines, (c) guidelines dealing with the repository's construction and operation before it is closed (preclosure), and (d) guidelines governing the long-term behavior of the repository after it is closed (postclosure).

In response to many comments that DOE needed a weighting system to use the guidelines, DOE decided to rank the order of importance of various guidelines. Specifically, DOE determined that the postclosure guidelines governing the repository's behavior after the radioactive materials have been emplaced in it and the repository closed would be of primary significance in its site evaluations. DOE believes that these guidelines are most important to ensure the long-term protection of the public's health and safety and the quality of the environment. The preclosure guidelines dealing with the construction of the repository and its operation before it is closed are to be secondary considerations.

Each of the potentially acceptable sites will first be evaluated against the disqualifying conditions specified in the guidelines. To continue to the nomination stage, DOE must determine that a site is not disqualified based on any of these conditions. To illustrate the highly technical nature of the guidelines and the judgments that will be required in applying them, each of these disqualifying conditions is listed in appendix III.

Throughout the site selection stages applicable to the first or second repository, DOE will evaluate each candidate site against all the guidelines. NWPA (sec. 112) requires that the Secretary try to recommend sites in different geologic media. Accordingly, in its application of the guidelines for site nomination and recommendation, DOE believes it must consider diversity of geohydrologic settings.

⁹Committee report on the 1985 Energy and Water Development Appropriation Bill (H.R. 5653), H.R. Rep. 755, 98th Cong., 2nd Sess. 145 (1984).

DOE considers its identification of nine potentially acceptable sites to be final

Despite criticism from some of the affected states, DOE does not plan to reconsider its initial identification of the nine sites using the final siting guidelines. According to DOE's May 1983 response to comments on the proposed siting guidelines, the Congress did not intend for the initial site selections to be reconsidered using the final guidelines because the act (sec. 116(a)) required DOE to identify states containing "potentially acceptable sites" within 90 days of the act's passage, but allowed 180 days for issuing the siting guidelines. Consequently, DOE believes the site identification required by the act would have been impossible if the Congress had intended that DOE use the final siting guidelines to select sites for the first repository. DOE officials told us that a reconsideration of all possible sites would (1) require 2 or 3 years to complete and (2) probably result in selecting the same sites. DOE plans to carry out the remaining siting activities for the first repository and all screening activities for the second repository in accordance with the final siting guidelines.

FUTURE STATUTORY DEADLINES FOR THE SITING OF THE FIRST REPOSITORY ARE NOT EXPECTED TO BE MET

NWPA set only two future deadline dates for key decisions in the siting of the first repository. DOE does not expect either deadline date to be met, as discussed below.

Statutory deadline for recommending three candidate sites

NWPA specifies that not later than January 1, 1985, the Secretary of Energy shall recommend to the President, for further study through site characterization,¹⁰ three candidate sites for the first repository (sec. 112). If the Secretary were to comply with this date, by the end of 1984, DOE would have to

¹⁰Site characterization refers to activities undertaken in either the laboratory or the field to study the geologic condition of a potential repository site. Such testings include borings, surface excavations, exploratory underground shafts, and in-situ testing to evaluate the suitability of a site for location of a repository.

- complete an environmental assessment¹¹ to accompany each site to be nominated,
- nominate at least five sites that are suitable for site characterization, and
- recommend three sites for site characterization to the President.

DOE could not complete these activities until it received NRC's concurrence in the siting guidelines. Notwithstanding the delays in issuing the siting guidelines, in commenting on a draft of this report, DOE said that it was striving to meet the January 1, 1985, deadline. Since 1983, DOE had been preparing environmental assessments for each of the nine potentially acceptable sites in anticipation of final issuance of the guidelines in the summer of 1984.

In early October 1984, OCRWM officials informed us that DOE was no longer striving to meet the January 1, 1985, statutory deadline because of unanticipated complexities involved in preparing the environmental assessments for all nine sites. As an example of the complexities, DOE noted that each environmental assessment was about 1,500 pages and that OCRWM was trying to ensure that each was consistent in its treatment of specific topics in order to allow proper comparisons to be made. At that time, we were told that December 20, 1984, had been fixed for release of the nine draft environmental assessments for official comments and that a 90-day comment period was set. Accordingly, OCRWM officials do not expect that DOE will be in a position to meet the statutory milestone for recommendation of three candidate sites until at least mid-1985.

Statutory deadline for recommending the first repository site to the Congress

NWPA (sec. 114(a)(2)(A)) requires the President to submit a final recommendation for the first repository site to the Congress by March 31, 1987. If the President determines that an extension is necessary, the act provides for a 1-year extension if the President notifies the Congress by March 31, 1986, of the reasons for the delay.

In 1983, DOE began to acknowledge that the March 1987 statutory deadline would not be met. DOE's latest schedule anticipates that the President will recommend the first repository site

¹¹The environmental assessments required by NWPA (sec. 112(b)(1)(E)) must, among other things, describe how a site was selected, comparatively evaluate the site with other locations, and assess the potential impacts of on-site testing and locating a repository at that site.

by June 1990, although OCRWM officials have more recently advised us that this target date may be pushed back. OCRWM officials attributed the reasons for the expected delay to (1) delays in initiating site characterization and (2) more recent estimates indicating that on-site testing will take longer than earlier anticipated once the characterization phase begins.

The site characterization phase generally entails, for each site,

- issuing site characterization plans which describe the testing program;
- obtaining applicable state and/or local permits for drilling exploratory shafts or boreholes;
- constructing exploratory shafts, mining test areas underground, and installing test equipment; and
- conducting tests at the surface and subsurface of the site to determine its suitability as a repository.

At the time of NWPA's enactment, DOE was planning on recommending to the President three sites for characterization in the summer of 1983. While the act allowed DOE until January 1, 1985, to make this recommendation, DOE believed it would need to make the recommendation earlier if the March 1987 date was to be met. At that time, DOE was estimating that it would take about 3 years to conduct a thorough site characterization program. (More current DOE plans indicate that the site characterization phase could take about 49 months). In addition, potential host states for the repository and other parties expressed concern that DOE was moving too fast at that early stage in the program and was not allowing sufficient time for state consultation and public comment. Subsequently, DOE dropped its emphasis on meeting the March 1987 date and began to provide more time for state consultation and public comment on such matters as the siting guidelines.

ACTIONS THAT COULD FURTHER
AFFECT THE TIMELINESS OF
REPOSITORY SITING ACTIVITIES

DOE faces challenges both prior to and during the site characterization period that could further delay the project's schedule. These potential delays could occur from

- difficulties in obtaining state permits,
- litigation, and
- challenges to the quality of DOE's site characterization work.

Once the President has recommended a final site to the Congress, the act provides for a state's formal disapproval of the recommendation. This process could trigger a delay in licensing approval, site construction work, and completion of an actual repository.

Impact of state permitting actions on DOE's siting activities

State actions could affect completion of site testing by delaying or denying permits for various siting activities. DOE is committed to complying with applicable state and local regulations and is entering into agreements with states to facilitate obtaining necessary permits. However, state or local opposition to the program could delay issuance of these permits. Some states have already taken actions which some DOE officials believe could adversely affect DOE's siting activities. For example, in an effort to ensure that DOE follows their siting regulations and procedures, Texas and Mississippi have passed laws stipulating the manner in which DOE can conduct its siting studies:

--Texas passed a law requiring a state permit before drilling any exploratory shaft.

--Mississippi passed a law requiring that DOE apply for a permit from the state before completing siting work. The law provides that DOE must brief the state on planned field work and that the state review DOE siting plans. In addition, the law provides that DOE cannot locate a repository in an area in which 500 or more people live within a 5-mile radius. Specialists from both DOE and Mississippi believe this law would eliminate virtually the entire state from consideration.

Litigation of various siting activities possible

NWPA established procedures for obtaining judicial review of certain DOE or presidential actions under the act. To expedite any judicial review process, the act (sec. 119) requires that lawsuits be filed within 6 months of the date of the decision or action being contested and gave exclusive jurisdiction over such suits to the U.S. courts of appeals.

Possible legal challenges to various early aspects of DOE's siting process, which could further delay the program, are already a concern to DOE and others. For example:

--Officials from DOE, one of its contractors, and affected states told us that the legality of the final siting guidelines may be challenged in court to ensure that they comply with the act. According to DOE headquarters officials, such a challenge has the

greatest likelihood to delay the project's schedule since other siting activities depend upon approved guidelines.

--An official with the Nevada Department of Minerals told us that litigation may develop regarding the environmental assessments prepared to accompany site nominations. A major issue could be that because the data developed at each site are not identical, DOE cannot rank the sites fairly. Another issue could be the quality of data used in the assessment since the act (sec. 112(c)(2)) allows the President to delay recommendation of a site for characterization if he determines that information provided by DOE is insufficient.

--The deputy manager of Battelle's Office of Nuclear Waste Isolation, a DOE contractor, said that all potential salt repository sites are located on private land. DOE's acquisition of or access to this private land could involve litigation, including condemnation proceedings. According to an OCRWM official, such proceedings may be needed during site characterization to allow DOE to drill boreholes or exploratory shafts on private lands.

Quality of some siting work has been questioned

Because of differences in the data available on each site and differences in the review processes DOE is using to evaluate these data, DOE may be subject to other challenges once its site characterization work is completed. Such challenges have the potential to delay the program's schedule.

DOE siting work differs among sites

DOE recognizes that only after site characterization will complete data be available for site evaluations. Before site characterization, some site data will be less detailed because testing was at various stages when NWPA was passed. Sites where testing has been ongoing for many years, such as the Washington and Nevada sites, will have more detailed data. (See table on the next page.) For example, a conceptual site-specific design for a basalt repository at the Hanford Reservation in Washington was completed in 1983, but similar designs have not been prepared for the other sites. DOE believes that NWPA (sec. 112(b)(1)(E)(ii)) recognizes that data may be insufficient to determine whether a site complies with all of the siting guidelines at the time of site nomination. Accordingly, DOE plans much more rigorous analyses during site characterization to equalize its technical data before a final repository site recommendation is made. However, the adequacy of DOE's site characterization work has already been challenged at one site, which raises the possibility that challenges could occur at other sites.

Activities Undertaken at Nine Candidate Repository Sites
Since Enactment of NWPA

Site	Activity ^a					
	Boreholes	Tectonics studies	Deep hydrology tests	Seismic monitoring	Meteorological studies	Archeological survey
Yucca Mountain, Nevada	X	X	X	X	X	
Cold Creek Syncline, Washington	X	X	X	X		
Deaf Smith County, Texas	X			X		
Swisher County, Texas	X			X		
Davis Canyon, Utah	X					X
Lavender Canyon, Utah	X					X
Vacherie Dome, Louisiana				X		
Cypress Creek Dome, Mississippi						
Richton Dome, Mississippi						

^aThe activities shown in this table are not necessarily directly comparable. For example, DOE has reported that boreholes have been sunk at six sites. However, several of these boreholes have been sunk in the general area of the sites, while at other sites the holes were in the specific location identified for a repository.

Source: GAO summary of data provided by DOE, February 21, 1984, in letter to Chairman, Subcommittee on Energy Conservation and Power, House Committee on Energy and Commerce.

DOE has encountered criticism on its more detailed site characterization work at the Hanford Reservation. The quality of this work was the subject of oversight hearings by the House Interior and Insular Affairs Subcommittee on Energy and Environment (May 26, 1983). Officials from the NRC, Geological Survey, and Washington State told us that, on the basis of their reviews of the 1982 DOE basalt site characterization report,¹² DOE's contractor was too optimistic in analyzing available data.

¹²Because siting work was so advanced at Hanford, some site characterization had been done prior to NWPA. However, the act requires additional data which would be included as part of the site characterization plan under NWPA, should Hanford be recommended as one of the three sites for further evaluation.

Specifically, the contractor was too optimistic regarding the speed with which ground water moves through basalt and the number of fractures in the basalt.

NRC and Geological Survey have recommended additional technical work that the contractor must do to improve the basalt characterization work at Hanford. The contractor has reviewed the recommendations and has initiated further work. DOE told us that completion of this work will not delay the basalt project.

Different peer review processes used
to judge quality of DOE siting work

Throughout its past nuclear waste activities, DOE provided opportunities for peer review and comment. These peer review groups were established to review activities on a program-wide basis and to review activities at certain sites in order to add technical objectivity and credibility to DOE's repository development program. The current waste management program has no consistent peer review process which could subject DOE's technical analyses to future challenges and revisions, especially given states' concerns about DOE's application of the siting guidelines.

DOE officials told us that its field offices responsible for identifying potential sites for the first repository have different peer review processes. For example:

- Because DOE's Basalt Waste Isolation Project Office does not have the technical staff needed to oversee contractor activities, a basalt overview committee (with federal, state, university, and private industry representatives with technical backgrounds in areas such as engineering and rock mechanics) has provided technical review for the Project Office. In addition, the Project Office hires consultants to provide needed technical expertise.
- The director of the Nevada Nuclear Waste Storage Investigation Office said that the Geological Survey reviews and supports all geological work done by that Office. At one time, the Office had a peer review group, but it has not been active for the past year. The Office is trying to reestablish the peer review group.
- The salt site subcontractors conduct their own internal reviews before they send their reports and study results to DOE's prime contractor for the salt studies. The prime contractor then conducts its own internal reviews before submitting documents to DOE. Also, DOE conducts oversight reviews and for the past year has used other reviewers such as the Argonne National Laboratory, Geological Survey, and the Texas Bureau of Geology to review technical documents.

The National Research Council issued a report in 1983 which recommended that DOE institute a more deliberate overall technical review of its waste disposal program.¹³ On November 29, 1983, DOE informed us that it is still considering the extent of future review needed and does not expect to have implemented the Council's recommendation until late 1984. A headquarters-initiated review group is currently evaluating all site projects to assure that each project is acquiring appropriate data. DOE expects that additional peer review groups will result from this work.

Final site recommendation
subject to state disapproval

NWPA (sec. 116 and 118) provides that the governor or legislature of a state where the recommended repository site is proposed to be located, or an affected Indian tribe on whose reservation the repository is proposed to be located, may disapprove of such a designation by submitting a disapproval notice to the Congress. If the Congress, within 90 calendar days of continuous session after receipt of such notice, does not pass a resolution specifically approving this site, the site is deemed disapproved and the President must recommend another site within 1 year. Obviously, such an event would delay construction of the repository, resulting in considerable program delay and additional cost.

Some states being considered for the first repository have taken the position that they do not want to be chosen for the repository's location because of the potential economic, environmental, health, and safety impacts associated with a repository. For example, the Governor of Nevada has testified during local hearings on the siting guidelines that he is absolutely opposed to having a repository in his state. He said that he would exercise his disapproval authority to block the siting of a repository in Nevada. DOE recognizes that a site recommended for a repository could be rejected by affected states, Indian tribes, the President, or the Congress. DOE has stated it will make every effort to conduct site evaluation and selection activities in such a manner as to give no cause for rejection of the site it selects.

¹³A Study of the Isolation System for Geologic Disposal of Radioactive Wastes, National Research Council, Washington, D.C., 1983.

CHAPTER 3

FINANCING THE COST OF THE

GEOLOGIC WASTE DISPOSAL PROGRAM

The Nuclear Waste Policy Act of 1982 places the responsibility for paying the government's cost for geologic disposal of highly radioactive materials on the generator or owner of the material. To ensure that this objective is accomplished, the act called for the immediate establishment of a special trust fund within the U.S. Treasury, called the Nuclear Waste Fund (NWF), to separately account for receipts and expenditures for authorized disposal activities (secs. 302(c) and (d)). The act also provided for DOE, in calendar year 1983, to

- enter into contracts by June 30, 1983, with the nation's nuclear utilities and other commercial owners of highly radioactive materials to establish the terms and conditions under which DOE will make available disposal services (sec. 302(b)(2)) and
- establish procedures by July 7, 1983, for the collection and payment of fees for DOE services (sec. 302(a)(4)).

DOE entered into the contracts and established fee collection procedures by the specified deadline dates. These actions represent a major step toward providing NWF an assured source of revenues and placing the financing responsibility on the generator or owner of highly radioactive materials.

On the other hand, we believe DOE faces a difficult challenge in assuring an adequate source of revenues for the program in the long term. The major source of uncertainty arises from the length of time, about five decades, over which DOE is attempting to project program revenues and costs.

Independent of the uncertainty in long-term program revenues, we believe that, from a sound financial management and equity standpoint, DOE should fully evaluate ways to more promptly collect NWF fees from all anticipated users of DOE's repository services. While DOE has established procedures for the collection and payment of fees for the spent fuel owned by the nation's utilities and other commercial owners, DOE has not done so for the high-level wastes (1) produced by DOE defense programs (which account for about 97.5 percent of the reprocessed high-level wastes in the United States) and (2) maintained by New York State (which accounts for the remaining 2.5 percent). On the basis of our analysis of DOE's fee collection procedures or plans, we found that DOE may be able to accelerate millions of dollars in payments from these anticipated repository users.

DOE ENTERED INTO THE MANDATED CONTRACTS
WITHIN THE REQUIRED TIME FRAME

By June 30, 1983, the deadline imposed by NWPA for current generators and owners, DOE had entered into an initial 70 contracts with nuclear utilities and other commercial owners of spent nuclear fuel. According to DOE these contracts covered all of the nation's then commercial generators and owners of spent nuclear fuel. The contracts set forth the specific terms and conditions, as well as the procedures for collection and payment of fees, under which DOE shall make available disposal services for commercial spent nuclear fuel under the act.

To carry out the act's contracting provisions, DOE drafted a standard contract and published it as a proposed rule in the Federal Register on February 4, 1983 (48 Fed. Reg. 5458). On March 3, 1983, DOE held public hearings on the proposed contract in Washington, D.C. In addition to the oral comments at the public hearings, DOE received written comments from 85 organizations representing electric power associations, nuclear power companies, environmental organizations, consumer protection associations, state and federal agencies, and individual citizens. Based on the comments it received, DOE modified its proposed contract and published the final standard contract in the Federal Register on April 18, 1983 (48 Fed. Reg. 16590). By June 30, 1983, DOE had signed an initial 70 contracts with 56 different organizations, including 46 nuclear utilities (accounting for 60 contracts due to multiple plant operations), 8 owners of industrial test reactors, and 2 nuclear fuel vendors. According to DOE and NRC officials, a nuclear reactor cannot receive an operating license until covered by a DOE contract.

Generally, DOE's standard contract delineates the terms and conditions under which DOE will make available geologic disposal services to the nuclear utilities. Under the contract DOE is responsible for

- beginning to accept title to utility spent nuclear fuel, after commencement of "facility operations,"¹ but not later than January 31, 1998;
- providing shipping casks and all necessary transportation of the spent fuel from its location to a DOE facility;

¹NWPA (sec. 302(a)(5)(A)) required the contracts to provide for DOE title acceptance "following the commencement of operation of a repository." The standard contract, however, uses the term "DOE facility," which is more broadly defined as a repository facility or other storage facility(ies) to which spent fuel may be shipped by DOE prior to its transportation to a repository.

- informing the utilities annually, beginning on April 1, 1991, of DOE's priority for accepting spent fuel at the DOE facility;
- reporting annually, beginning not later than July 1, 1987, on DOE's capacity to receive and accept spent fuel under contract; and
- providing information annually to the utilities on the disposal program, including information on cost projections, project plans, and progress reports.

In return, the nuclear utility must

- pay an ongoing fee to DOE for newly generated electricity from nuclear reactors (electricity generated after April 7, 1983) and a one-time fee for previously discharged spent fuel (for electricity generated prior to April 7, 1983);²
- annually provide DOE information on actual spent fuel discharges and projected discharges for the next 10 years;
- no later than October 1, 1983, provide DOE specific information on its spent nuclear fuel inventory as of April 7, 1983, and fuel assemblies removed prior to this date where there are plans for reuse; and
- arrange and provide for all preparation, packaging, required inspections, and loading activities necessary for transporting the spent fuel to a DOE facility.

²Wisconsin Electric Power Co. (WEPCO) challenged as "unlawful, arbitrary, capricious, and an abuse of discretion" the contract provision under which DOE would calculate the total amount of ongoing fee owed the NWF. The federal District Court for the District of Columbia, citing section 119 of the NWPA, dismissed WEPCO's complaint on grounds that the court lacked jurisdiction to hear the complaint. Wisconsin Electric Power Co. v. Hodel, Civ. Ac. No. 83-2281, slip op. at 6 (D.D.C. July 18, 1984). The court, however, stated that even if it had jurisdiction it would dismiss the complaint because DOE's construction of the statute is a reasonable one.

General Electric Uranium Management Corp., which holds spent nuclear fuel used to generate electricity prior to April 7, 1983, challenged the one-time fee. The court held that it did have jurisdiction over the matter and upheld DOE's determination of that fee. General Electric Uranium Management Corp. v. DOE, 584 F. Supp. 234 (D.D.C. 1984).

During the public comment process on DOE's draft contract, utilities expressed concern in the following areas:

- Ongoing fees should be based on the net amount of electricity sold rather than gross electricity generated. DOE disagreed. DOE believed that the intent of NWPA was to collect fees for all spent fuel resulting from commercial generating capabilities, including the spent fuel from electricity generated that is not sold and which may be used by the utility on site for power generation.
- DOE should take all the spent fuel the utilities may wish to deliver at any specific point in time. DOE believed such a responsibility would be difficult to manage. Instead, DOE reserved the right to prioritize its acceptance of the spent fuel and allowed owners to exchange DOE-approved commitments. DOE also noted that its contract provides for emergency acceptance of the spent fuel.
- No provisions were made for reducing disposal fees if spent fuel is reprocessed or utilities take actions which would result in disposal cost savings. In considering this concern, DOE decided to defer taking a position on this issue until and if reprocessing becomes a reality and the savings to the program of any utility action can be demonstrated.
- There is no provision for an audit by the utilities. In essence, the utilities requested management, economy and efficiency, and financial audit rights over NWF. DOE disagreed that such rights should be granted because it saw no precedent for the private sector to audit the federal government. Further, DOE indicated that such an audit would not be necessary because DOE's Inspector General, GAO, the Office of Management and Budget, and a public accounting firm would provide program oversight.

Despite these and more recent concerns,³ we believe it was a significant accomplishment for DOE to enter into the initial 70 contracts by June 30, 1983. In our opinion, the contracts represent a major step in providing NWF with an assured source of funds and transferring the financing responsibility for the program from the federal government to the owners and generators of highly radioactive materials.

³In September 1984, the Secretary of Energy indicated that DOE plans to incorporate provisions into the contracts that would specify the minimum amounts of spent nuclear fuel DOE would be obligated to accept by January 31, 1998, whether or not a repository is in operation. We did not evaluate the appropriateness of DOE's plans but note that concerns have been raised about whether such plans would make DOE's commitment to the nuclear utility industry the driving factor in the repository program.

UNCERTAINTIES IN DETERMINING THE ADEQUACY OF ONGOING DISPOSAL FEES

Notwithstanding the revenues to be collected by DOE under contracts with commercial entities, we believe that DOE faces a difficult challenge in assuring an adequate source of revenues for the program. Ongoing fees paid by the nation's nuclear utilities, based on the amount of nuclear electricity generated, were set by NWPA at an initial rate of 1 mill (1/10 of a cent) per kilowatt-hour.⁴ NWPA specifically provides procedures for adjusting these fees to ensure full recovery of the government's program costs. Through the end of fiscal year 1984, about \$403 million in such fees was paid into NWF by nuclear-electric utilities.

We found that at this early stage in the program, both revenue and cost estimates were highly uncertain. The major source of the uncertainty arises from the length of time, about five decades, over which DOE is attempting to project program revenues and costs. Recent DOE and Congressional Budget Office (CBO) reports indicate that increases in the fee will be needed to account for inflation, and possibly real cost growth. DOE, however, has indicated that it will delay proposing any increases to the 1-mill fee until the late 1980's when more reliable data are expected to be available. Moreover, we found that an Office of Management and Budget (OMB) restriction could hinder DOE's ability to finance program costs in the short term.

Requirements for offsetting program costs

NWPA requires DOE to annually review the amount of fees collected to determine whether they will provide sufficient revenues to offset program costs (sec. 302(a)(4)). If DOE determines that either insufficient or excess revenues are being collected, the act requires DOE to propose an adjustment in the 1-mill per kilowatt-hour fee. DOE must transmit this proposal to the Congress. DOE has stated that it will report the proposed fee adjustment to the Congress but will delay implementation of the

⁴The 1-mill fee represents only a small part of the overall cost of nuclear electricity. During 1982, the average national cost of generating nuclear electricity was about 32 mills per kilowatt-hour.

new disposal fee until 90 days of continuous session of Congress have elapsed.⁵

NWPA does not specify the time period in which DOE should attempt to recover the government's cost through adjustments in the disposal fee. DOE anticipates it will take over 50 years to site, license, construct, operate, and decommission two repositories. As a matter of policy, it is DOE's objective to avoid increases in the disposal fee in order to maintain fee stability over the anticipated life of the program.

Cost and revenue estimates are highly uncertain

DOE first examined the adequacy of the 1-mill fee in covering the costs of the waste disposal program in a report entitled Report on Financing the Disposal of Commercial Spent Fuel and Processed High-Level Radioactive Waste (DOE/S-00201, July 1983). To provide some insight into the uncertainties and difficulties DOE believes are important in evaluating the adequacy of fees for such a long-term program, the following discusses the nature of the large uncertainties in cost and revenue estimates contained in that report. In the section following this discussion, we present the results of DOE's more recent (July 1984) assessment of fee adequacy.

Cost uncertainties

In its July 1983 report, DOE estimated the total life-cycle cost for two repositories⁶ and other program activities at between \$16 billion and \$28 billion (in constant 1982 dollars).

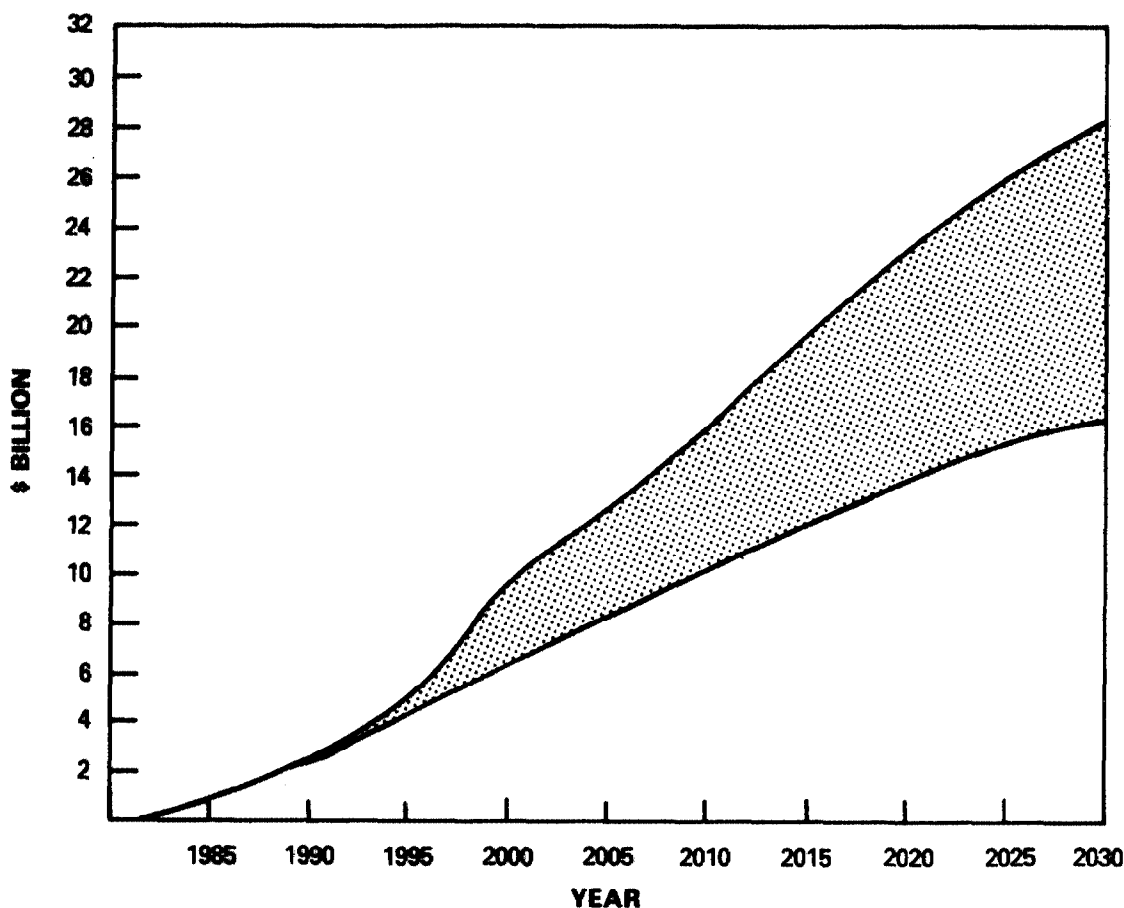
⁵Under the act, a DOE-proposed fee adjustment would become effective within 90 days unless either house of the Congress disapproves the adjustment. In Immigration and Naturalization Service v. Chadha, ___ U.S. ___, 103 S. Ct. 2764 (1983), the Supreme Court ruled that a similar one-house legislative veto was not constitutional. H.R. 4690, introduced on January 31, 1984, contained provisions for amending this requirement of NWPA. Under H.R. 4690, any fee adjustment proposed by DOE would be effective only upon enactment of a joint resolution by the Congress. No action was taken on the bill, however, before the Congress adjourned.

⁶Although NWPA authorizes the construction of one repository, DOE believes a second repository will be authorized by the Congress at a future date. Consequently, DOE cost estimates for the program are based on costs for two separate repositories.

As shown in the figure below, DOE estimated that the range of program costs would become broader in time because of the difficulties in estimating future occurrences. DOE noted that unanticipated cost growth can arise from a number of factors, including lack of information in the early stages of engineering, imprecise program definition, changes in program scope, unanticipated regulatory changes, faulty inflation projections, and inadequate cost control measures.

RANGE OF CUMULATIVE ESTIMATED WASTE MANAGEMENT PROGRAM COSTS

(Constant 1982 Dollars)



Source: Department of Energy

The table below shows how small differences in inflation would drastically increase DOE estimates of total program costs. Assuming a 3-percent annual rate of inflation, DOE estimated the cost of the program at between \$35 billion and \$64 billion. A 5-percent annual rate of inflation increased the estimated costs to a range of \$61 billion to \$114 billion.

Total Program Cost Estimates

	<u>Lower limit^a</u>	<u>Reference case^b</u>	<u>Higher limit^c</u>
	----- (in billions of dollars) -----		
Fiscal year 1982 dollars	\$16	\$18 to \$20	\$ 28
With 3-percent annual inflation	35	43	64
With 5-percent annual inflation	61	77	114

^aThe lower limit cost estimate represents a modification of the reference case cost estimate using optimistic assumptions on waste packaging, mining, transportation distance, and other factors.

^bThe reference case cost estimate represents the best available information on the scope of the program with regard to repository design, number of repositories, geologic medium, and type of waste to be disposed.

^cThe higher limit cost estimate represents a modification of the reference case cost estimate using conservative assumptions on waste packaging, mining, transportation distance, monitored retrievable storage, and other factors.

Source: Summarized by GAO from DOE data.

DOE concluded that projected revenues at a fee of 1 mill per kilowatt-hour would be sufficient to cover its best estimate of program costs under the reference case (\$18 billion to \$20 billion) if the annual rate of inflation does not exceed 3 percent. In reaching this conclusion, DOE cautioned that the potential for cost increases is very high for projects of this magnitude and the costs of technology-intensive programs often exceed initial estimates by a large amount.

The potential for cost increases was also addressed in a September 1982 Congressional Budget Office report entitled

Financing Radioactive Waste Disposal. CBO found that the potential for cost overruns is the most important factor affecting a determination of fee adequacy. According to CBO, the early cost estimates for this new and untested program can escalate rapidly. CBO noted that the history of comparable projects suggests that cost overruns as high as 160 percent are plausible. While CBO stressed that a cost overrun of this magnitude is not a certainty, CBO also cautioned that it cannot be ruled out.

Revenue uncertainties

Besides cost, the amount of revenues is very uncertain. In this regard, the anticipated growth of nuclear power is the most important consideration. Using data published by the Energy Information Administration (EIA) in March 1982, DOE projected revenues in its July 1983 report based on 165 gigawatts⁷ of installed nuclear capacity in the year 2000, rising to 285 gigawatts in 2020. In less than 2 years, however, EIA in September 1983 lowered its long-term estimates of installed nuclear capacity by about 21 percent for 2000 (from 165 to 130 gigawatts) and by about 19 percent for 2020 (from 285 to 230 gigawatts).⁸

Reflecting the decline in nuclear power growth, DOE's short-term projections of NWF revenues, as reported to the Congress, have also decreased significantly, as the following table shows.

⁷One gigawatt is equal to 1,000 megawatts, or roughly the maximum power of one nuclear power plant.

⁸EIA makes four projections of nuclear power growth. These projections include base (no growth), low-, mid-, and high-growth scenarios. Since DOE's preliminary study is based on a mid-case scenario, only these data are shown.

DOE Revenue Projections

<u>Fiscal Year</u>	Projection in DOE's fiscal year 1984 <u>budget request^a</u>	Projection in DOE's fiscal year 1985 <u>budget request^b</u>	Annual amount of <u>decline</u>
----- (in millions of dollars) -----			
1983	\$ 98	\$ 74 ^c	\$ 24
1984	448	311	137
1985	482	378	104
1986	531	435	96
1987	591	504	87

^aBased on the ongoing fee of 1 mill per kilowatt-hour.

^bBased on small assumed increases in the ongoing fee beginning in fiscal year 1985, as discussed later in this chapter, and EIA's short-term projections of nuclear electricity generation as of December 23, 1983.

^cActual amount.

Cumulatively, DOE's revenue projections for the period 1983 through 1987 declined by about 20 percent, or a total of \$448 million between its fiscal year 1984 and 1985 budget requests.

Increases in the ongoing disposal fee reported likely to be needed

DOE and CBO have both completed more recent reports⁹ which indicate that the 1-mill fee will likely need to be increased to account for the effects of inflation, and possibly real cost growth, at some point during the long life of the disposal program.

DOE's latest report (July 1984) found that NWF is extremely sensitive to the effects of compound annual inflation. Indexing the fee to adjust for inflation would, according to the report, prevent NWF deficits if DOE's "high-cost" program estimates represent the upper limits of program cost uncertainty. As shown in

⁹Nuclear Waste Fund Fee Adequacy: An Assessment, DOE, July 1984; and Nuclear Waste Disposal: Achieving Adequate Financing, CBO, August 1984.

the following table, based on six combinations of electricity generation and program cost cases it analyzed, DOE found that NWF would accumulate deficits through the year 2040 in three cases with 2-percent annual inflation, five cases with 3-percent inflation, and all cases with inflation over 3 percent.

Final Nuclear Waste Fund Balances Through the Year 2040
(Billions of 1983 dollars)

Electricity generation cases	Program cost category	Annual rate of inflation (in percent)			
		<u>0</u>	<u>2</u>	<u>3</u>	<u>5</u>
Mid-reference	Low	\$26	\$ 7	\$ 1	\$ -9
	High	20	1	-6	-15
Low	Low	15	2	-4	-11
	High	10	-4	-9	-16
Firm-base	Low	6	-2	-6	-11
	High	2	-7	-10	-15

Source: Nuclear Waste Fund Fee Adequacy: An Assessment, DOE (July 1984).

DOE's findings on the likely need to increase the 1-mill fee to account for inflation are generally supported by CBO's August 1984 report. Moreover, CBO found that indexing the fee to offset inflation would provide some insurance against growth in actual program costs. For example, CBO noted that if the fee is increased annually by the rate of inflation beginning in 1984, resulting revenues could finance from 30 percent to 78 percent more outlays than current cost predictions, thus protecting against cost overruns.

In its July 1984 report and in its comments on a draft of this report, DOE acknowledges the need to exercise maximum cost control over the program. The report's updated estimate of total program cost was \$20.9 billion to \$23.3 billion (in 1983 dollars). DOE views cost uncertainty as the dominant financial hazard confronting the program and is, according to the report, introducing rigorous measures to assure fiduciary responsibility and accountability.

In its July 1984 report, DOE also indicated that it will delay any proposal to increase the 1-mill fee to account for inflation or real cost growth until the late 1980's given the present substantial uncertainty about both program cost and revenue projections. At that time, DOE expects more reliable data to be available on nuclear growth projections and program costs as the program evolves from its present conceptual design phase to the engineering phase.

Limitation on the use
of borrowing authority

Adding to DOE difficulties in assuring an adequate source of program revenues is an Office of Management and Budget restriction which in effect prevents DOE from using the NWF's borrowing authority to finance short-term revenue shortfalls. Section 302(e)(5) of NWPA provides DOE authority to borrow funds from the Treasury, as may be agreed to by DOE and Treasury, "If at any time the moneys available in the Waste Fund are insufficient to enable the Secretary to discharge his responsibilities" Our review of the legislative history of this provision found there was some congressional expectation that DOE would need to use this borrowing authority in the early years of the program. An August 20, 1982, congressional committee report expressed this expectation in the following way:

"It is anticipated that receipts of the Waste Fund will be insufficient to finance the activities required in at least the first several years of operation. Borrowing authority is therefore provided to the Secretary, as agreed to by the Secretary of the Treasury. Such borrowed funds are required to be repaid with interest when the Fund becomes self-supporting."¹⁰

During the administration's review of DOE's fiscal year 1985 budget request for NWF, OMB limited DOE's budget authority for NWF expenditures to NWF's projected annual revenue receipts. Thus, as long as this limitation is in effect, DOE is precluded from using NWF's borrowing authority to cover program costs when expenditures in any given fiscal year are projected to exceed revenues. According to DOE's budget request, the administration's objective is to keep NWF self-supporting.

OMB's restriction limits the options available to DOE to finance program costs. Based on a fee of 1 mill per kilowatt-hour, DOE had estimated a revenue shortfall of \$78.8 million in fiscal year 1987. Given OMB's restriction on borrowing, DOE noted in its fiscal year 1985 budget request that to cover this revenue shortfall it may be necessary to increase the waste disposal fee charged the nation's nuclear utilities to 1.047 mills for fiscal years 1985 and 1986 and to 1.094 mills in fiscal year 1987. In March 1984, however, DOE announced that such increases may not be necessary because some utilities had indicated an intent to deposit in NWF in June 1985 one-time fees for the disposal of existing spent nuclear fuel. (See discussion on p. 46.) Accordingly, if these one-time fees become available in June 1985, DOE believes that the OMB restriction will not have an adverse impact

¹⁰House Committee on Energy and Commerce report on the Nuclear Waste Policy Act of 1982 (H.R. 6598), H.R. Rep. No. 785, Part I, 97th Cong., 2nd Sess. 38 (1982).

on NWF activities and the need for short-term increases in the 1-mill fee can be avoided.

DOE SHOULD FULLY EVALUATE
WAYS TO MORE PROMPTLY COLLECT
NUCLEAR WASTE FUND FEES

Although NWF may avoid revenue shortfalls in the short term, we believe DOE needs to reexamine the payment terms that should be established for all generators and owners to ensure equitable treatment and sound financial management practice in recovering the government's program costs. Accordingly, we believe that DOE, in exercising its discretionary authority to establish NWF fee collection procedures, should fully evaluate ways to more promptly collect fees from all generators and owners of highly radioactive materials in the United States.

Under Section 111 of NWSA, the Congress established the policy that the government's cost of carrying out activities for the disposal of highly radioactive material should be paid by its generators or owners. The act's implementing provisions call for these costs to begin accruing April 7, 1983, even though DOE is not required by the act to begin taking title to the highly radioactive material until the first geologic repository begins operation. NWF was created expressly for the purpose of serving as the vehicle for deposit of such payments. The act set the initial fee to be paid by utilities generating nuclear electricity after April 7, 1983, and provided DOE general guidance for setting fees to be paid by owners of previously generated commercial spent fuel and owners of reprocessed high-level radioactive waste (i.e., DOE defense programs and New York State). Moreover, the act gave DOE the flexibility to determine when and how the fees should be collected to ensure full recovery of the government's costs.

Because of the time value of money, we and the Department of Treasury generally urge all federal agencies as a matter of sound financial management practice to make every effort to collect payments owed the government in a timely manner.¹¹ We believe that DOE, as custodian of NWF, should apply this financial management principle in exercising its discretionary authority to establish NWF fee collection procedures. Based on our analysis of present NWF fee collection procedures or plans (see pp. 41 to 53), we found that DOE may be able to accelerate the depositing of millions of dollars into NWF.

¹¹Our guidance is contained in Title 2 (Section 15) of the General Accounting Office's Policy and Procedures Manual for Guidance of Federal Agencies (Accounting Principles and Standards). Treasury's guidance is contained in the Treasury Fiscal Requirements Manual (Section 8020).

From a program management standpoint, such an acceleration in NWF deposits would give DOE more opportunities to balance the potentially competing NWF management objectives which we noted in the previous sections, namely,

- assuring that NWF has sufficient revenues available to enable DOE to discharge its responsibilities under the act (a statutory requirement),
- maintaining fee stability over the long life of the program by avoiding increases in the ongoing waste disposal fee (a DOE policy objective), and
- keeping NWF self-supporting by avoiding the use of borrowing authority (an OMB policy objective).¹²

In addition, such an acceleration in NWF deposits would allow DOE to accelerate retiring NWF's debt to the government. NWPA allows DOE to request the Treasury to invest balances in NWF which are in excess of current needs and use the interest revenues to offset future program costs. According to DOE and Treasury officials, before DOE can invest it must retire NWF's outstanding debt or have cash balances in NWF greater than such debt. In establishing NWF, DOE transferred into it a total of \$258.5 million in unexpended DOE fiscal year 1983 appropriations. (See app. IV.) NWPA requires that these funds, with interest, be repaid to the government. During fiscal year 1983, the interest expense on this debt was about \$3 million. DOE's budget projects this interest expense to be about \$7 million in fiscal year 1987. By eliminating this financing cost and helping to keep NWF self-supporting, accelerated deposits could in the long run be less costly to the ultimate payers--primarily consumers of nuclear electricity and U.S. taxpayers.

Ways to accelerate payments

To determine if and how DOE could more promptly collect payments to NWF, we reviewed DOE's fee collection procedures or plans for the four general categories of generators or owners of highly radioactive materials. The categories are

- utilities generating nuclear electricity after April 7, 1983;
- commercial owners of previously discharged spent fuel;
- DOE-owned defense high-level waste; and
- New York State-maintained high-level waste.

¹²We did not evaluate the appropriateness of the DOE and OMB policy objectives.

Since NWPA's enactment, DOE has collected payments from just the nation's nuclear-electric utilities. Overall, we found that there are actions DOE may be able to take to accelerate payments from all categories, as summarized in the table on page 43 and discussed in the following sections. Each action, however, has implementing obstacles or concerns that DOE would need to fully address. For example, actions we identified for the first two categories related to the disposal of commercial spent nuclear fuel would require DOE to amend its disposal services contracts, and actions for the last two related to the disposal of reprocessed high-level waste would require DOE to develop a firm basis for establishing the amount of fees to collect.

Utilities generating nuclear electricity after April 7, 1983

Current fee collection procedures

Section 302(a)(2) of NWPA requires DOE to collect ongoing fees from utilities generating nuclear electricity on or after April 7, 1983, based on a set fee of 1 mill per kilowatt-hour. DOE's standard contract requires the utilities to make automatic payments for the actual amount of nuclear electricity each utility generates on a quarterly basis. All payments must be made by wire transfer within 30 days after the utilities' assigned quarter.¹³ DOE expects to collect, on average, about \$80 million per quarter in such fees.

DOE's standard contract does not contain any rationale for the quarterly payment terms, and involved DOE officials were not able to provide us a documented rationale for its selection. According to the Acting Director of the responsible DOE division, it was his understanding that the quarterly payment terms were selected because DOE (1) had limited time to establish collection procedures, (2) did not have an automated system developed, (3) did not know specifically what would be involved in collecting the fees, and (4) wanted to minimize the administrative burden on a limited staff.

Accelerating payment

One way for DOE to accelerate ongoing fee payments would be to use monthly billing procedures. Under present billing procedures, fees for electricity generated in a given quarter need not be paid to DOE until 30 days after the end of the quarter. If,

¹³Under DOE's contract, generators of electricity were permitted to select a payment quarter after paying fees for April to June 1983 and a one-time adjustment fee for electricity generated from July 1, 1983, to the start of the assigned payment quarter.

Ways to Accelerate Payments To the Nuclear Waste Fund

GAO illustrative examples of effects
of accelerated payments

Current fee collection procedure/plans				GAO illustrative examples of effects of accelerated payments		
Category of generator or owner	DOE fee basis	DOE estimate of fees due	Payment Due Date(s)	Way to accelerate payment	Potential additional interest revenues to NWF	Implementation obstacles/concerns
Generators of nuclear electricity after April 7, 1983	One mill per kilowatt-hour of electricity generated	\$80 million quarterly	Within 30 days after each assigned quarter	Use of monthly billing procedures	\$2.7 to 8 million annually ^a	Would require amending contracts Potential additional cost to utilities
Commercial owners of previously generated spent fuel	Charge per kilogram of spent fuel	\$2.3 billion on a one-time basis	Owners have three options: 1) Payment over 40 quarters with interest based on 10-year Treasury note rate 2) Payment prior to DOE accepting spent fuel with interest from April 7, 1983, based on Treasury bill rate 3) Payment in 1985 without interest	Require deferrals be subject to commercial interest rates	Options: 1) \$20.7 million annually for 10 years ^b 2) \$46 million annually to 15 years ^c 3) \$305.9 million annually for 2 years ^d	Would require amending contracts Potential additional cost to owners
DOE-owned defense high-level waste	Not established	None available	None established	Begin payments in fiscal year 1986 if President determines use of repositories developed under NWA will be made	Cannot be estimated with available information	Need to establish firm fee basis Would require appropriations
New York State-maintained high-level waste	Amounts held by New York State for the "perpetual care" of the wastes	\$5.5 million	At time of delivery to repository, estimated 1998	Require amount held by New York State to be promptly deposited in NWF	\$550 thousand annually ^e	Need to establish firm fee basis Would require amending agreement with New York

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^aBased on GAO computations using a 10-percent interest rate to reflect the time value of money.

^bAssumes over the 40-quarter period, the average fee outstanding will be \$1.15 billion (\$2.3 billion divided by 2) times 1.8 percent (difference between average yields of utility bonds which was 13.3 percent and the yield of Treasury notes which was 11.5 percent on November 30, 1983).

^c\$2.3 billion times 2 percent (difference between the prime interest rate which was 11 percent as of November 30, 1983, and the yields on Treasury bills on that same date which was about 9 percent).

^d\$2.3 billion times 13.3 percent, the average yield of utility bonds on November 30, 1983.

^e\$5.5 million times 10 percent.

instead, DOE used estimated monthly billing procedures¹⁴ and collected the fees at the start of each month, it would be collecting the fees an average of 3 months sooner. For example, estimated charges for electricity generated in January would be collected January 1, rather than April 30, or 4 months sooner; similarly, February charges would be collected 3 months sooner; and March, 2 months sooner. Considering the time value of money, the collection of \$80 million in fees an average of 3 months sooner would be worth, at a 10-percent annual interest rate, an additional \$8 million annually to NWF.

If a longer payment period is allowed, the benefits to NWF will be less. For example, if DOE required payment of the fees 30-days after the end of each month, as is the practice utilities use to charge residential customers for electricity, it would on average collect the revenues 1 month sooner. Assuming the same amount of monthly collections and rate of interest, collecting the fees at this time would be worth an additional \$2.7 million annually to NWF.

We identified two primary implementing obstacles to or concerns about the use of monthly billing procedures. First, it would require DOE to amend its contracts with the utilities through a new rulemaking procedure because the standard contract now provides for automatic payments without a DOE invoice on a quarterly basis. Second, considering the time value of money, monthly payments would add to utilities' costs because they would have to pay sooner. Given this second point, DOE may have difficulty getting utilities to agree to amend the payment provisions of their contracts. In discussing this matter with representatives of investor-owned nuclear-electric utilities, we were told that the utilities would oppose such an amendment given the additional cost which would be passed on to utility customers. Nonetheless, DOE could seek to negotiate with the utilities such an amendment at an opportune time in the future. DOE's standard contract with the utilities recognizes that its provisions were developed in light of uncertainties necessarily associated with such long-term contracts. Accordingly, it contains a provision for amending the contracts that allows DOE to initiate renegotiation of contract terms.

¹⁴If the estimated value of goods or services a federal agency provides an individual or organization outside the government is \$50,000 or more, the Department of Treasury Fiscal Requirements Manual (section 8020.10) urges the agency to prepare estimated bills for not less than 75 percent of the estimated value of the goods or services. In July 1983 the Energy Information Administration estimated that the average monthly amounts owed the NWF during fiscal year 1984 for the utility generating the most electricity would be nearly \$2.5 million and \$22,000 for the utility generating the least.

How much of an administrative burden it would be to collect fees on a monthly basis (either at the start of the month using estimated monthly billing procedures or 30 days after the end of each month) is unclear. In commenting on a draft of this report, DOE suggested we note that an additional administrative burden for utilities and DOE would result from collecting fees at the start of the month due to the need to reconcile estimated and actual fee payments. On the other hand, another DOE comment suggested we acknowledge a November 1983 OCRWM analysis that, in part, notes that alteration of the existing payments schedule to reflect monthly collections would pose minimal administrative hardships on DOE because its processing system is rapidly being computerized and will be able to accommodate a wide variety of changes, including a shift to monthly fee collections. That analysis also noted that while utilities would be faced with increased costs in making a fee schedule change, they already provide comprehensive reactor operating statistics to NRC on a monthly basis.

Commercial owners of previously discharged spent fuel

Current fee collection procedures

Section 302(a)(3) of NWPA requires DOE to collect a "one-time" fee from owners of spent fuel discharged from commercial power reactors before April 7, 1983. While this fee must be equivalent to the 1-mill per kilowatt-hour fee for newly generated electricity, the act requires DOE to establish the one-time fee based on the weight of the "heavy metal" in the spent fuel. DOE's standard contract established a complex four-tier pricing schedule whereby the one-time fee ranges from \$80 to \$184 per kilogram of spent fuel. DOE estimates that commercial owners of previously discharged spent fuel, mostly utilities, owe NWF a total of \$2.3 billion in one-time fees.

DOE has not collected any of these fees. Under DOE's standard contract, utilities have 2 years from the date of their contract with DOE to select one of three deferred payment options:

- Option 1: Payment over 40 quarters (10 years) consisting of fee plus interest on the outstanding fee balance. Compound interest from April 7, 1983, to first payment will be based on the 13-week Treasury bill rate in effect for each quarter. Beginning with the first payment, interest will then be calculated using a 10-year Treasury note rate that is in effect on the date of the first payment. A lump-sum or partial lump-sum payment is permitted anytime before the end of the 40-quarter period without interest penalty.
- Option 2: Lump-sum payment anytime before delivering the spent fuel to the federal government. Interest

will be computed from April 7, 1983, and compounded quarterly to the date of payment based on the 13-week Treasury bill rate in effect for each assigned quarter.

Option 3: Full payment before June 30, 1985, or 2 years after the contract is signed, whichever comes later. No interest will be charged under this option.

DOE does not expect to know what payment options will actually be selected until June 1985. DOE believes that until then it is not possible to predict with any certainty when the \$2.3 billion and any related interest revenues would be paid. Accordingly, DOE's fiscal year 1985 budget request does not include any collections of the one-time fee in its NWF revenue projections for fiscal years 1983 through 1987. (See p. 37.)

To obtain a preliminary indication of what options might be selected in June 1985, DOE in February 1984 asked utilities for an expression of their intent. Accounting for the \$2.3 billion owed NWF, the results of DOE's survey showed that of 43 utilities responding, 4 indicated a preference for option 1 (\$306 million); 8 for option 2 (\$231 million); 16 for option 3 (\$722 million); and 15 utilities did not indicate a preference (\$1,045 million). OCRWM budget officials stress that the results of this informal survey are not binding on the utilities. As of September 1984, DOE was in the process of once again contacting the utilities and public utility commissions to gain a better indication of their intentions.

Under DOE's standard contract, utilities will have no further financial obligation to DOE for the disposal of previously discharged spent fuel upon payment of the one-time fee and any interest and penalties on unpaid or underpaid amounts. In contrast to the 1-mill per kilowatt-hour fee for newly generated electricity, which is subject to annual adjustments, the one-time fee is not subject to adjustment.

Accelerating payment

In commenting on a draft of this report, DOE stated that it prefers payment option 3 and will encourage utilities to employ this option, although its funding strategy will be flexible enough to accommodate any mix of options finally selected by the utilities. DOE told us that the entire purpose of the interest-free option 3 was to encourage accelerated payments and, based on preliminary input from the utilities, significant lump-sum payments will result by June 30, 1985.

In considering DOE's comments on this section, and after further review of DOE's criteria for deferred payments, we noted

that DOE's adoption of an interest-free option appears inconsistent with the criteria. DOE's criteria for deferred payments contained in its Accounting and Procedures Handbook state that "all deferred payments are subject to interest charges." The accounting criteria also indicate that deferred payment should be used only on a case-by-case basis. It specifically states:

"Deferral of payments is to [be] avoided. Companies undergoing extreme hardship due to disaster or events of a similar nature may be considered for deferral of payments only upon request by the companies. Field Office Managers and the Director, Washington Financial Services Division, should evaluate each request for deferral of payments and obtain adequate justification before approving such requests. The best interest of the Government should be of prime consideration."

Allowing deferred payment options and not collecting interest on one of the payment options appears inconsistent with DOE's criteria, especially given the fact that some utilities had already collected fees from their ratepayers for the disposal of spent fuel in anticipation of NWPA or the enactment of comparable legislation.¹⁵ We recognize, however, that the act provided DOE little time (180 days from enactment) to establish procedures for the collection and payment of the one-time fees. While the payment obligation for the one-time fee became effective on April 7, 1983, and DOE had finalized the payment procedures and the methodology for calculating the fee on April 18, 1983, DOE needed more time to determine and verify the actual fees each utility owed and to provide utilities the time to make arrangements to collect and pay the fees.

To provide additional economic incentive for utilities to make full payment promptly, in a draft of this report we suggested that DOE consider seeking an amendment to its contract which would apply a rate of interest to deferred payments commensurate with the cost of commercial borrowings, such as the yields on outstanding utility bonds, rather than an interest charge based on yields of Treasury securities, which are generally less than commercial securities of the same maturity.¹⁶ If the utilities still choose to defer payment and pay a higher interest rate, we noted that NWF will benefit from the increased interest revenues. To illustrate this effect, we estimated that NWF would realize the additional

¹⁵For example, according to its 1983 annual report to stockholders, one utility had already collected from its customers the full amount--about \$113 million--of its one-time fee liability to the Nuclear Waste Fund.

¹⁶The interest rates on Treasury securities are generally lower than commercial securities of the same maturity because there is less risk associated with the federal government's borrowings.

amounts of interest revenues shown in the following table, if the interest rate was based on commercial rates such as the prime rate and average yields of utility bonds (11 and 13.3 percent, respectively, on November 30, 1983) rather than yields of Treasury bills and notes (9 and 11.5 percent, respectively, on November 30, 1983), assuming all utilities chose the same option.

Illustrative Effect of the Use
of Commercial Interest Rates^a

<u>Option</u>	<u>Additional interest revenues</u>
1. Payment for 40 quarters	\$20.7 million annually for 10 years ^b
2. Lump-sum payment prior to delivery of waste to DOE in 1998	\$46 million annually up to 15 years ^c
3. Lump-sum payment by 1985	\$305.9 million annually for 2 years ^d

^aAssumes all utilities choose the same option.

^bAssumes over the 40-quarter period, the average fee outstanding will be \$1.15 billion (\$2.3 billion divided by 2) times 1.8 percent (13.3 percent minus 11.5 percent).

^c\$2.3 billion times 2 percent (difference between the prime interest rate which was 11 percent as of November 30, 1983, and the yield on Treasury bills on that same date which was about 9 percent).

^d\$2.3 billion times 13.3 percent.

At this juncture--utilities have until June 30, 1985, to select one of the three payment options--it may be too late for DOE to attempt to retroactively apply commercial interest rates to all three options. DOE could, however, at least explore the feasibility and benefits to NWF of prospectively applying commercial rates to the payment options.

In commenting on the use of commercial, rather than Treasury, interest rates, DOE said that a specific rulemaking to amend the contracts, and possibly a change in the act, would be required before commercial rates could be applied. While we agree that a specific rulemaking would be required to amend the contracts, DOE did not explain why the act would need to be changed. NWPA does not address how or when DOE should collect the one-time fee; rather NWPA delegated to DOE the authority to establish procedures

for the collection and payment of fees. DOE set the deferred payment options and current interest rates using its discretionary authority to establish fee collection procedures. Neither Treasury nor DOE has regulations that specify what interest charges are to be applied to deferred payments. Accordingly, we believe DOE could, under its discretionary authority to establish fee collection procedures, apply commercial interest rates.

In reviewing the interest rate issue, we sought the Treasury Department's views. In February 1984, Treasury responded that it did not believe that applying Treasury interest rates to deferred payments of disposal fees provided for in the DOE contract is appropriate. Treasury's reasoning was:

"As a fundamental principle of overall Administration credit program policy, Federal credit should only be extended in situations where credit is not otherwise available on reasonable terms, and the credit is necessary to achieve important national objectives. That is, the Government should act only as a lender of last resort. Since yields on Treasury securities are lower than private commercial rates of interest, there is a built-in incentive for the generators of the waste to look solely to the Government for financing, which would be contrary to the lender of last resort principle. Moreover, this result would appear to be contrary to the objective of shifting the financing of the program from the Government to the generators of the waste."

In addition, Treasury said that it follows

". . . that using a rate based on the cost of commercial borrowing would be preferable to using current market yields on outstanding Treasury securities. Moreover, requiring the generators to demonstrate that credit is not otherwise available on reasonable terms in order to be eligible for Federal credit at commercial rates would be consistent with overall Federal credit program policy and the objective of shifting the financing of the program to the generators."

DOE-owned defense high-level waste

Current fee collection procedures

As of January 7, 1985, unless the President has found that development of a separate repository for defense high-level waste¹⁷ is required, NWPA (sec. 8) requires the Secretary of Energy to "proceed promptly with arrangement" for use of a commercial repository, including ". . . the allocation of costs of

¹⁷This waste is owned by DOE and stored at three federal installations located in Idaho, South Carolina, and Washington.

developing, constructing, and operating" the repository. DOE is currently evaluating for the President whether the commercial repository should also be used for defense high-level wastes. In August 1984, DOE distributed for comment a draft of its evaluation,¹⁸ which recommends the use of a single repository for the disposal of commercial and defense wastes.

Section 8 of NWPA also requires the federal government to pay into NWF the costs resulting from disposal of defense high-level wastes in any repository developed under the act for commercial users. DOE has not yet established a firm basis for determining the amount of fees the government should pay to cover such costs. Furthermore, it is unclear when DOE would begin making payment to NWF for defense high-level wastes if the President decides the defense waste should be placed in a commercial repository. DOE's fiscal year 1985 budget request for NWF states that if DOE

" . . . decides to recommend disposal of the defense waste in a commercial repository, the Federal government would pay for disposal of the waste in the repository. This use of the repository would generate additional revenues for the Fund by allocating some of the costs of the repository to the defense waste generators."

The budget request is silent, however, on when the government would begin paying for this waste disposal. An earlier DOE report, prepared in June 1983 by DOE's Assistant Secretary for Defense Programs and transmitted to the Congress by the President, indicates that at that time DOE was not planning to make any payments until 1998 or when defense waste was accepted for disposal in the commercial repository. It contained the following cost estimates for disposal fees and transportation to a repository.

Estimated Annual Cost for Disposal
of Defense High-Level Waste in a
Geologic Repository

<u>1984</u>	<u>1996</u>	<u>2001</u>	<u>2006</u>	<u>2011</u>	
to	to	to	to	to	
<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>Total</u>

------(in millions of 1984 dollars)-----

Amount for transportation and disposal in geologic repository	0.0	\$13.0	\$21.7	\$29.7	\$35.0	\$497.0
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Source: Defense Waste Management Plan, DOE (DP-0015, June 1983).

¹⁸An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste, DOE (DP-0020 (Draft), July 1984).

Accelerating payments

We believe that DOE could be prepared to request, in its fiscal 1986 or 1987 budget, appropriations to pay fees to NWF for the disposal of defense high-level waste. As previously noted, NWPA requires DOE to "proceed promptly with arrangement" for allocating costs of the repository between defense and commercial waste after DOE conducts the required presidential evaluation due not later than January 7, 1985. Given that the full costs of repository development are currently being borne by the nation's nuclear-electric utilities under contract, it may be more difficult for DOE to get utilities to agree to amendments in their contracts which would require or encourage them to make prompt payments if the federal government was not prepared to pay a fair share of the costs of repository development for the waste it owns.

Before DOE requests appropriations for disposal of defense waste, DOE would need to decide what is an appropriate fee to charge the federal government for repository development costs. According to a July 1984 report prepared for DOE's Assistant Secretary for Defense Programs, disposing of defense wastes in the commercial repository would add between \$758 million and \$1.49 billion in construction and operating costs.¹⁹ These estimates, however, do not include the costs for development and evaluation activities for the commercial repository, such as siting evaluations, technology development, and construction authorization, which the report states are estimated to cost about \$4.5 billion in 1984 dollars. The report notes that while these development and evaluation costs for the commercial repository will not change if defense waste is disposed of in the repository, a portion of those costs would have to be allocated to the defense waste and a final allocation mechanism has not been agreed upon.

While several methods of cost allocation are under consideration, DOE anticipates that the fee ultimately charged for

¹⁹These construction and operating cost estimates assume, among other things, that an additional disposal area for defense waste is constructed at the commercial repository site that will accommodate up to 20,000 packages of defense waste. The lower cost estimate further assumes the repository is constructed in a salt formation and requires no special packaging of the defense wastes; the higher cost estimate assumes the repository is constructed in "hard rock" (i.e., basalt, granite, or tuff) and the defense waste requires special packaging.

the disposal of defense high-level waste will be equivalent to the fees charged for disposal of civilian waste.²⁰

High-level waste maintained
by New York State

Current fee collection plans

DOE plans to use an NWSA repository to dispose of the high-level wastes located at the Western New York Nuclear Service Center in West Valley, New York.²¹ Disposal of West Valley waste in a federal repository is governed by statutory and contractual obligations which pre-date NWSA. These obligations stem from provisions in the West Valley Demonstration Project Act (42 U.S.C. 2021a note) and a subsequent cooperative agreement²² between DOE and the New York State Energy Research and Development Authority for implementing the act. According to DOE and New York Energy Authority officials, these obligations require that (1) DOE solidify, package in containers, and transport the solidified West Valley waste to an appropriate federal repository for permanent disposal and (2) the New York Energy Authority pay DOE the funds it holds for maintenance of West Valley wastes upon DOE delivery of the solidified wastes to a federal repository. Notwithstanding these obligations, the cooperative agreement makes clear that

²⁰Section 302(b)(4) of NWSA states that: "(4) No high-level radioactive waste . . . owned by any department of the United States . . . may be disposed of by the Secretary in any repository constructed under this Act unless such department transfers to the Secretary, for deposit in the Nuclear Waste Fund, amounts equivalent to the fees that would be paid to the Secretary under the contracts referred to in this section if such waste or spent fuel were generated by any other person." (Emphasis added.) DOE's Office of General Counsel explained to us that when this section is read in conjunction with "the statutory purpose of full cost recovery" as enunciated by sections 8(b)(2) and 111(b)(4), "it is anticipated that the fee charged under section 8(b)(2) for the disposal of defense high-level waste will be equivalent to the fees charged under sections 302(a)(4) and 302(b)(4) for the disposal of civilian waste, since in each case the applicable fee must ensure the recovery of all costs resulting from the disposal of the wastes covered by that fee."

²¹These wastes resulted from a commercial reprocessing plant at West Valley, New York, which operated from 1966 until 1972. New York State subsequently assumed responsibility for the wastes.

²²Cooperative Agreement between U.S. DOE and New York State Energy Research and Development Authority on the Western New York Nuclear Service Center at West Valley, New York, as amended on September 18, 1981.

"Nothing in the Act or this Agreement obligates the Department or the Federal government to pay the disposal costs, if any, for the solidified wastes."

Noting that New York State had about \$5.5 million in 1982 set aside in a fund for the "perpetual care" of the West Valley waste, DOE urged the New York Energy Authority in June 1983 to "prudently manage" the money in this fund. At that time DOE envisioned that the \$5.5 million, considering compound interest, would sufficiently cover New York's obligation to pay the disposal costs of the West Valley waste by the time the first repository is scheduled to become operational in 1998.

Accelerating payment

Because all other anticipated users of DOE's repository services are required to deposit fees into the Nuclear Waste Fund to pay for the costs of repository development, we believe DOE could seek prompt payments from New York State for the West Valley wastes. This would require an amendment to the cooperative agreement between DOE and New York State. While we did not evaluate whether the amounts in New York State's perpetual care fund would be adequate to recover a fair share of DOE's costs, we noted that a September 1983 study by a DOE contractor, using the fee schedule in DOE's standard contract for previously discharged commercial spent fuel (see p. 45), estimated the disposal cost for the commercial spent fuel reprocessed at West Valley at about \$34 million. This represents about one-fourth of the total spent fuel reprocessed at West Valley. (The contractor's study did not estimate the disposal cost for the remainder of the reprocessed spent fuel which was provided by the former Atomic Energy Commission.) As of March 31, 1984, the amounts in the perpetual care fund totaled about \$6.6 million, according to a New York Energy Authority official.

Given that DOE has not decided what is an appropriate fee to charge the federal government for defense high-level wastes (see p. 51), we believe that if DOE seeks prompt payment from New York State it should do so after it decides what is an appropriate fee to charge for the disposal of all high-level wastes. Defense wastes account for about 98 percent of the total high-level wastes in the United States. (West Valley wastes account for the balance.) Otherwise, DOE could end up charging New York State and the federal government different fees for disposal of essentially the same wastes.

RECOMMENDATIONS TO THE SECRETARY OF ENERGY

In recognition of sound financial management practice, we recommend that the Secretary of Energy, in exercising his discretionary authority as custodian of the Nuclear Waste Fund, fully evaluate ways to more promptly collect fees from all generators

and owners of highly radioactive materials in the United States. This evaluation should, at a minimum, consider the possible ways to more promptly collect fees discussed in this chapter.

In addition, the Secretary of Energy should decide what is an appropriate fee to charge the federal government and New York State for the disposal of high-level wastes.

AGENCY COMMENTS

DOE and the Department of the Treasury commented on a draft of this chapter. DOE commented that OCRWM is exploring alternatives to improve the program's revenue stream and that our recommendations were under study. More specifically, DOE told us that selection of alternatives involving fees for the disposal of commercial spent nuclear fuel would consider (1) the burden placed upon utilities relative to the benefits derived and (2) program revenue requirements in view of anticipated receipts from the "ongoing" and "one-time" fees. DOE did not, however, address what actions, if any, it would take on our specific recommendations, involving establishing fees for the disposal of reprocessed high-level wastes. (See app. VII.)

Treasury strongly supports subjecting the deferred payments for the one-time fees to commercial, rather than Treasury, interest rates. It had no objections to the other specific ways DOE might be able to accelerate fee payment which we recommended DOE evaluate fully. (See app. VIII.)

DOE also provided us specific comments aimed at enhancing the accuracy and clarity of the report. Where appropriate we incorporated these comments and our evaluation in the text of the report. In addition, we updated the report to include information on events, such as DOE and CBO recent reports on fee adequacy, which were not discussed in the draft report sent to the agencies for comment. None of these changes materially affected our recommendations.

CHAPTER 4

ESTABLISHING A SEPARATE ORGANIZATION

TO CARRY OUT DOE'S FUNCTIONS

The two previous chapters discussed DOE's efforts to lay the groundwork to successfully implement the act in two key functional areas--repository siting and program financing. To carry out the various functions assigned to the Secretary of Energy under the act, NWPA (sec. 304) called for the immediate establishment within DOE of a separate, high-level office referred to as the Office of Civilian Radioactive Waste Management. DOE formally activated OCRWM as a permanent headquarters organization on October 3, 1983. Until then, an interim project office was responsible for implementing the act's near-term requirements. In May 1984, the Senate confirmed the appointment of the first permanent director to head OCRWM.

While DOE has put OCRWM in place to direct the overall program, we found that OCRWM lacks direct authority to assign, control, and evaluate the field staff who execute the program through a multitude of contractors. For fiscal year 1984--the first year a separate personnel authorization ceiling was established for NWPA implementation activities--about half of the authorized staff resources were assigned to three DOE field offices. Given the high cost of repository development, the tight NWPA development schedule, and DOE contractual commitments with the nation's nuclear-electric utilities, we believe that OCRWM will need to pay particularly close attention to developing strong management controls over repository planning and execution under DOE's decentralized field management approach.

OCRWM recognizes the importance of this consideration and has taken actions to strengthen such controls. Moreover, the Secretary of Energy has appointed a 12-member special federal advisory panel to undertake a study required by the act of alternative approaches to managing repository construction and operation.

DOE HAS PUT IN PLACE THE OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

Calendar year 1983 was a difficult transition period for the DOE nuclear waste management program. With responsibility for immediate implementation of NWPA upon enactment on January 7, 1983, DOE had to restructure its organizational responsibilities to carry out the act. Previously, related responsibilities were directed by several different divisions within the Office of Assistant Secretary for Nuclear Energy and carried out by a decentralized network of field project offices. The following sections discuss major DOE actions to put in place a permanent organization under the difficult circumstances of having to implement the act's requirements and reorganize at the same time.

Interim headquarters organization

In January 1983, DOE established an interim organization called the Nuclear Waste Policy Act Project Office for the sole purpose of implementing the near-term requirements of the NWPA. The office was to operate only until OCRWM was formally activated by DOE. The Project Office's main objective was to meet the extensive actions required to be accomplished in the first 180 days following the act's enactment.

DOE staffed the interim organization rather quickly by temporarily assigning about 93 employees from other units. The director was detailed from DOE's Savannah River Operations Office; 45 staff members came from DOE's Office of Policy, Planning and Analysis; 44 came from the Office of Assistant Secretary for Nuclear Energy (the Office responsible for repository siting and development before NWPA); and 4 were detailed from other units.

The Office of Civilian Radioactive Waste Management

The interim organization basically remained the same until October 3, 1983, when DOE formally activated OCRWM. As shown in the organizational chart on p. 57, until June 13, 1984, OCRWM consisted of three major program sub-offices--the Office of Management, Office of Geological Repository Deployment, Office of Storage and Systems Development--and a separate staff office dedicated to institutional relations. Each of the program sub-offices was divided into divisions relating to specific functional areas such as repository siting and finance.

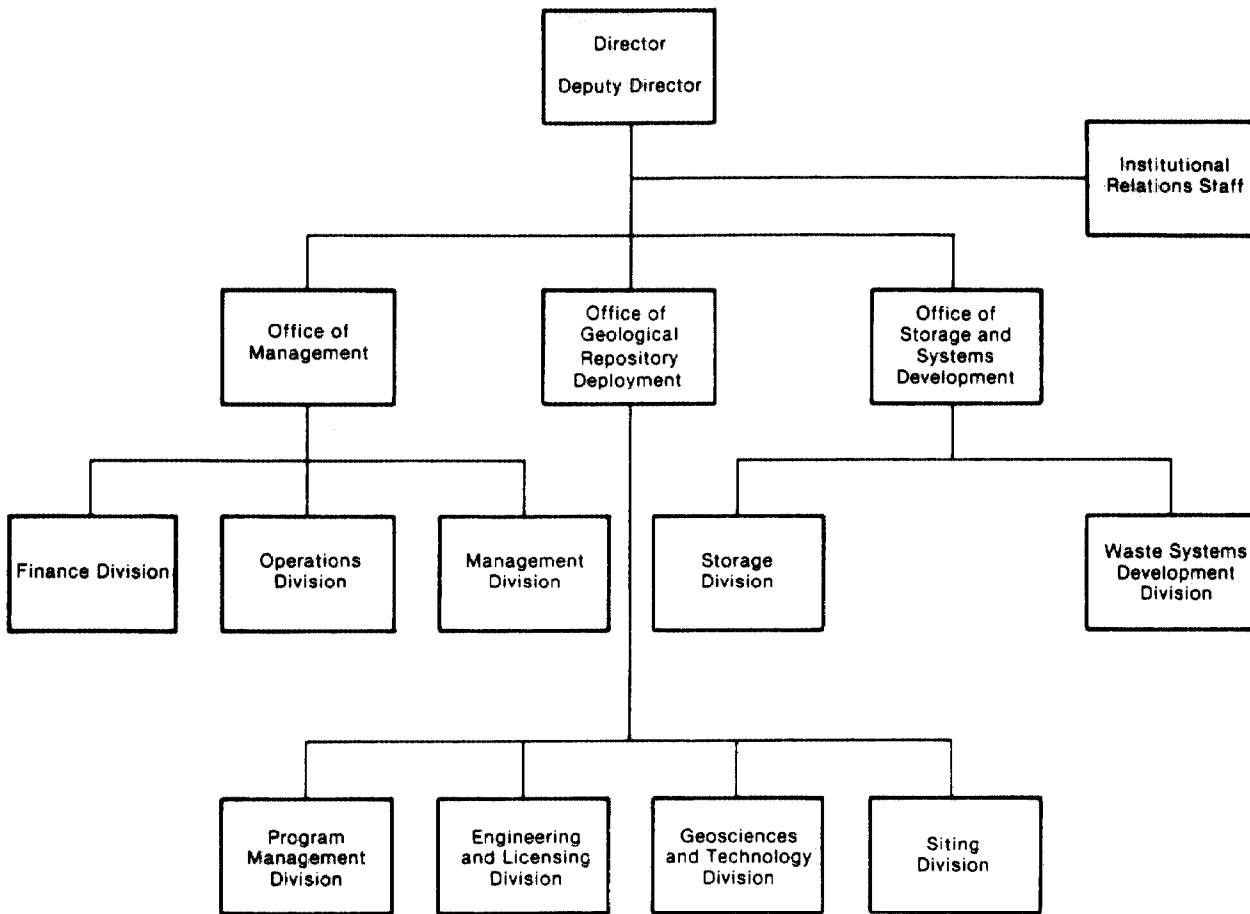
Following the appointment of a permanent OCRWM director (see discussion on p. 61), a further reorganization of OCRWM became effective on June 13, 1984. As shown in the organizational chart on p. 58, while the three major program sub-offices were continued, the reorganization established a new staff office--the Office of Policy, Integration, and Outreach--which replaced the institutional relations staff. In addition, certain divisional functions were realigned and certain organizational titles were revised. According to the OCRWM Director's request for approval, these organizational changes were made to reflect current management requirements and program emphasis.

Appendix V provides a description of the roles and responsibilities of the three OCRWM program sub-offices and the Office of Policy, Integration, and Outreach, as approved by the Secretary of Energy. The descriptions reflect several minor changes in responsibilities and office names which became effective in October 1984.

DOE field organization

While not a direct OCRWM organizational component, as shown in the chart on p. 59, DOE has delegated responsibility for the

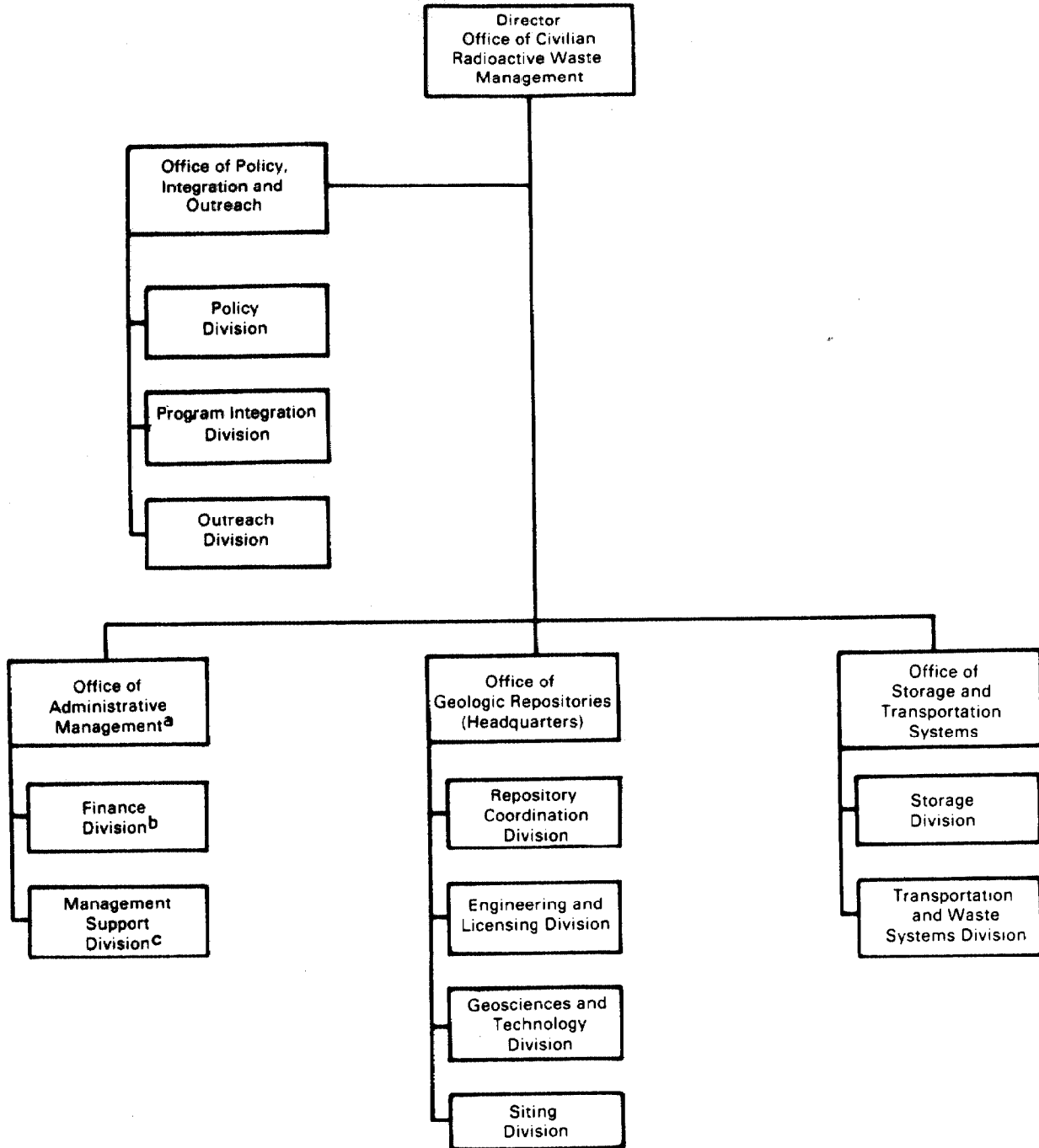
DOE
OFFICE OF CIVILIAN RADIOACTIVE
WASTE MANAGEMENT
(Oct. 3, 1983 to June 13, 1984)



Source: Department of Energy

**Department of Energy
Office of Civilian Radioactive
Waste Management**

(Effective June 13, 1984)



Source: Department of Energy

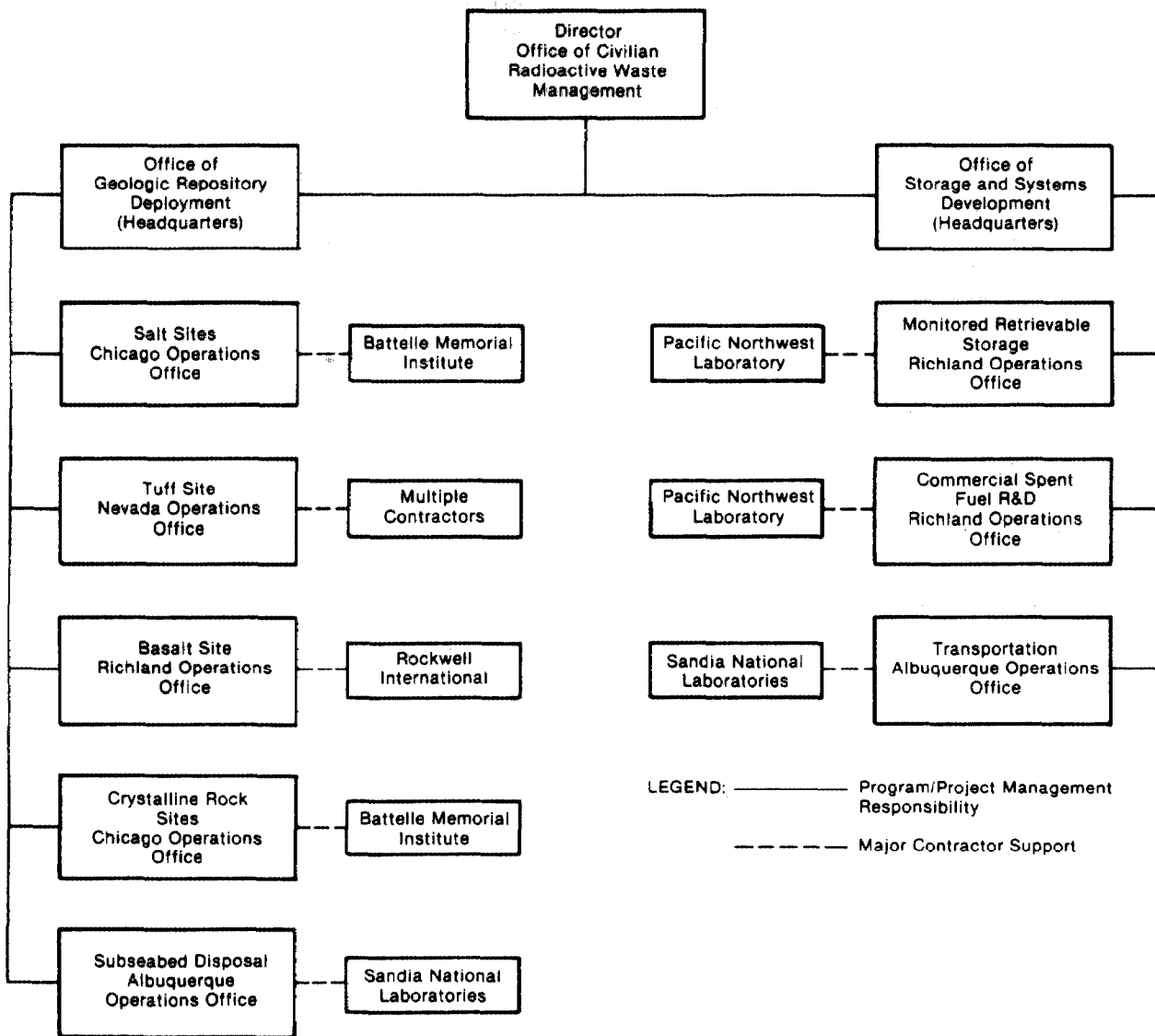
^aRenamed as the Office of Resource Management in October 1984.

^bRenamed as the Finance and Cost Analysis Division in October 1984.

^cRenamed as the Management Systems and Support Division in October 1984.

**FIELD OFFICE AND CONTRACTOR MANAGEMENT
RESPONSIBILITY FOR MAJOR PROJECTS**

OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT



Source: Department of Energy

day-to-day management of eight major projects required by NWPA to four DOE field operations offices. These offices, in turn, rely heavily on support from national laboratories and other major contractors to conduct specific activities. Basically, these delegations continue DOE's longstanding practice of assigning to its field offices responsibility for program execution under headquarters direction.

ALLOCATION OF INITIAL STAFFING AUTHORIZATIONS

Fiscal year 1984 was the first year a personnel authorization had been separately established for DOE's NWPA implementation activities. In the following sections we (1) discuss the allocation of the personnel authorization among OCRWM and the field operations offices, (2) present a snapshot, as of February 19, 1984, of DOE's efforts to assign full-time staff to those offices, and (3) discuss events leading to the assignment of OCRWM's first permanent director in May 1984.

Members of Congress (as well as others) have been concerned about the need for DOE to have permanent staff dedicated solely to carrying out the act, including the appointment of a permanent director. As early as May 1983 the House Committee on Appropriations expressed this concern in the following way:

" . . . continued progress in carrying out the requirements of this Act will require a permanent staff dedicated solely to the nuclear waste act program, and the timely appointment of a permanent office director."¹

Allocation of personnel authorization

Due to government-wide restraints on federal civilian employment, DOE can assign in any given fiscal year only a limited number of its overall allocated personnel resources to carry out NWPA. For fiscal year 1984, the personnel ceiling was 191 staff-years.² Of this amount, DOE allocated

- 104 staffyears, or 54 percent, among four field operations offices--Chicago (51), Richland, (32), Nevada (20), and Idaho (1)--and
- 87 staffyears, or 46 percent, to the OCRWM headquarters organization.

¹Committee report on the 1984 Energy and Water Development Appropriations Bill (H.R. 3132), H.R. Rep. 217, 97th Cong., 1st Sess. 102 (1983).

²Total employment in most civilian agencies is tightly controlled by the Office of Management and Budget on a full-time equivalent (work-year) basis.

To avoid overuse of staffing resources, the heads of OCRWM and each field operations office are responsible for ensuring that the total time spent by all assigned employees, including those working less than full time, on NWPA implementation activities does not exceed the program's respective personnel allocations. On the basis of these allocations, each office is responsible for its own position management and staffing utilization. Accordingly, not all of the 191 staffyears translate into actual positions for full-time staff dedicated solely to NWPA implementation activities. Some of these resources are used to support OCRWM or a field project office but are not directly assigned to either. For example, the Nevada Operations Office in February 1984 estimated that in support of its repository project, 10 of its 20 allocated staffyears would be used by four other units within the operations office--Manager's office (1.4 staffyears), Assistant Manager for Administration (2.9), Assistant Manager for Operations (2.6), and Assistant Manager for Engineering and Safety (3.1).

Status of permanent staffing

The table on p. 62 presents the status of DOE efforts to staff OCRWM and major field project offices with full-time employees as of February 19, 1984. As shown,

- 144 full-time staff members had been assigned (71 in OCRWM and 73 in the field) and
- vacant positions totaled 57 (29 in OCRWM and 28 in the field).

According to the director of OCRWM's Management Support Division, it was taking from 1 to 6 months to fill each vacancy, depending on whether the position was filled by lateral transfer of an existing federal employee or an outside hire.

Assignment of a permanent director

One key position that was apparently difficult to fill was the OCRWM director's position. Since its activation in October 1983, OCRWM has been headed by two different acting directors. NWPA requires the director³ to be appointed by the President, by and with the advice and consent of the Senate. In February 1984, DOE presented for formal consideration by the President a candidate to assume the permanent directorship. According to a DOE response to a congressional inquiry, while DOE had considered a number of candidates since January 1983, most were not interested in the position. A presidential nominee for the position was announced on May 7, 1984, and confirmed by the Senate on May 24, 1984.

³NWPA set the compensation of the Director, OCRWM, at a rate payable for level IV of the Executive Schedule, which is equivalent to the salary of an Assistant Secretary position in DOE.

DOE Staff Dedicated Solely to Carrying Out NWPA
(As of February 19, 1984)

	<u>Number of full-time employees^a</u>		
	<u>Positions authorized</u>	<u>Total assigned^b</u>	<u>Vacant</u>
Office of Civilian Radioactive Waste Management:			
Office of the Director	4	2	2
Institutional Relations staff	9	8	1
Office of Management	30	23	7
Office of Geologic Repository Deployment	42	28	14
Office of Storage and Systems Development	<u>15</u>	<u>10</u>	<u>5</u>
Total	100	71	29
Field project offices:			
Projects under Chicago			
Operations Office	58	40	18
Crystalline Rock Repository Project Office			
Salt Repository Project Office			
Projects under Nevada			
Operations Office	14	6	8
Nevada Nuclear Waste Storage Investigations			
Projects under Richland			
Operations Office	28	26	2
Basalt Waste Isolation Project			
Monitored Retrievable Storage			
Idaho Operations Office	<u>1</u>	<u>1</u>	<u>0</u>
Total	101	73	28
Total	<u>201</u>	<u>144</u>	<u>57</u>

^aIncludes Senior Executive Service, professional, and secretarial/clerical staff working full time in the listed offices. Does not include support staff in other DOE headquarters offices or field operations offices which may be working full time or part time on NWPA activities.

^bIncludes 15 temporarily detailed full-time staff in the OCRWM.

Source: GAO summary of data provided by the Director, Management Support Division, Office of Administrative Management, OCRWM.

STRONG MANAGEMENT CONTROLS OVER REPOSITORY
PLANNING AND EXECUTION ARE IMPORTANT

DOE's basic operational approach calls for headquarters program offices to be responsible for program policy and its field offices for program execution. Under this decentralized management approach, DOE has generally divided responsibilities for repository siting and development as follows:

- The headquarters OCRWM is responsible for developing and providing the various field offices overall program policy direction and controlling and establishing overall program schedules and budgets.
- The field offices are responsible for managing all project activities, including the work of national laboratories and major contractors.
- National laboratories and other major contractors are responsible for conducting most project activities, including preparing and implementing quality assurance plans.

Utility representatives have questioned whether this decentralized management approach is the most cost-effective way for DOE to assure the availability of the first geologic repository by the planned 1998 date. Stating that they have been providing money to the Nuclear Waste Fund at a rate of about \$25 million each month, their primary concern is whether DOE will fulfill its responsibilities. To assure effective and efficient control of the repository program, they have called for a strong, centrally controlled project office with substantial control over DOE's field activities.

DOE's heavy reliance on contractors

While we did not attempt to evaluate in this year's review the adequacy of DOE's existing planning and control mechanisms, we noted that DOE relies heavily on systems of key contractors for repository project planning and control. According to information DOE provided a congressional committee, contractors carry out about 90 to 95 percent of the repository siting and development activities and the ratio of contractor employees to DOE in-house employees was about 20 to 1.

To obtain another perspective on the extent of DOE's reliance on contractors, we acquired a listing of all contracts DOE funded during fiscal year 1983 for the three projects in the first repository program. On the basis of this information,⁴ we found that DOE had committed about \$228 million through 210 prime contracts or subcontracts for these projects, as shown below. (This amount

⁴Appendix VI provides a more detailed summary. We did not attempt to verify DOE's data because our only purpose in acquiring the data was to obtain a perspective on the amount of funds contractors control.

represents almost 90 percent of the \$254 million in appropriations available to the repository program in fiscal year 1983.)

	<u>Prime contracts</u>		<u>Subcontracts</u>		<u>Total obligations</u>
	<u>Number</u>	<u>Amount obligated</u>	<u>Number</u>	<u>Amount obligated</u>	
		(in millions)		(in millions)	
Salt repository project	18	\$ 70.5	42	\$36.5	\$107.0
Tuff repository project	12	53.2	45	9.9	63.1
Basalt repository project	5	40.8	88	17.0	57.8
Total	<u>35</u>	<u>\$164.5</u>	<u>175</u>	<u>\$63.4</u>	<u>\$227.9</u>

OCRWM field reporting relationship

As previously noted, DOE field staff, rather than the headquarters OCRWM, has primary responsibility for day-to-day management of project activities. While key field staff members may report directly to OCRWM managers on project implementation activities, these employees are assigned, controlled, and evaluated by managers in their respective field operations offices. Accordingly, OCRWM managers do not have the authority to directly control the field staff who implement their requirements through a multitude of contractors. OCRWM managers, however, do have input into the allocation of total program resources. DOE told us that OCRWM, in coordination with the Assistant Secretary for Management and Administration, approves the allocation of resources--both staffing and dollars--to field operations office for implementing NWPA.

Under NWPA, the head of OCRWM is directly responsible to the Secretary of Energy for carrying out DOE's functions under the act. Other than this requirement, NWPA does not address reporting relationships or specify a structural alignment between OCRWM and the field staffs that are responsible for the day-to-day management of major NWPA projects. As we noted in a previous report,⁵ the Secretary of Energy has considerable discretionary authority to determine how DOE's field staff should support headquarters organizations, such as OCRWM.

Because OCRWM lacks the direct authority to assign, control, and evaluate the field resources assigned to its mission, it may be difficult to maintain the dedicated staff resources that would be accountable for specific program efforts. In our opinion, such

⁵A New Headquarters/Field Structure Could Provide a Better Framework for Improving Department of Energy Operations (EMD-81-97, Sept. 3, 1981).

accountability is important to ensure the successful and cost-effective development of geologic repositories given DOE's decentralized management approach and the many characteristics, summarized below, which set DOE's geologic repository activities apart from most federal activities.

- These activities have specific, clear objectives--that is, operation of the first geologic repository by January 31, 1998, and siting of the second not later than March 31, 1991.
- DOE has made contractual commitments with the nation's utilities to begin accepting title to commercial spent fuel (or high-level wastes if reprocessing becomes available).
- Repository siting and development activities are high-risk undertakings with "first-of-a-kind" technical and institutional components.
- NWPAs requires that anticipated users of the repository pay fees to cover the government's expenditures in financing these activities.

DOE recognizes that successful and cost-effective development of geologic repositories will require close management attention to systematic planning and control. DOE is in the initial stages of designing a program-wide planning and control system as a means to measure actual performance in accomplishing planned technical, cost, and schedule objectives. In addition, since passage of NWPAs, DOE has taken several actions to strengthen its controls over repository planning and execution. For example:

- DOE awarded a technical support contract estimated to cost \$36.1 million over 5 years,⁶ to assist headquarters in coordinating, overseeing, and managing the repository program.
- The new divisions within the Office of Geologic Repository Deployment were created to provide better technical coordination among the repository projects as well as more direct headquarters management involvement.
- The Office of Policy, Integration, and Outreach was created to provide central staff support to the OCRWM Director in policy formulation, program planning, and general oversight of program execution actions, including assuring integration of headquarters and field activities and observing quality assurance in program execution.
- Beginning with fiscal year 1985, DOE will have integrated its financial accounting and budgeting system with its project management control system over costs, schedules,

⁶The contract consists of a base year with four 1-year options.

and technical performance. This should result in the routine collection of detailed cost data on 10 separate repository subactivities.

Moreover, the Secretary of Energy, in December 1983, appointed a 12-member special federal advisory panel to study alternative approaches to managing repository construction and operation. NWPA (sec. 303) directed the Secretary to undertake a study, which would include the feasibility of establishing a private corporation to manage all civilian radioactive waste management facilities, and submit it to the Congress by January 7, 1984. Other management approaches the panel has studied include creating a separate federal agency or establishing a federally chartered private corporation. The panel is scheduled to submit its report to the Secretary in January 1985. DOE intends to make the panel's report and the Secretary's response available for public review.

THE CIVILIAN RADIOACTIVE WASTE MANAGEMENTPROGRAM: APPROPRIATIONS ANDBUDGET REQUESTS (FYs 1983-87)

	Prior appropriations (FY 1983/1984)	FY 1985 budget request ^a		
		<u>FY 1985</u>	<u>FY 1986</u>	<u>FY 1987</u>
-----000 omitted-----				
<u>Nuclear Waste Fund</u>				
Repository deployment:				
First repository	\$439,097	\$247,100	\$427,100	\$403,200
Second repository	28,592	28,700	50,600	75,600
Monitored retrievable storage	15,499	8,500	1,500	1,500
Program management and technical support	47,266	40,069	41,000	41,300
Debt service (interest)	<u>7,767</u>	<u>3,300</u>	<u>5,200</u>	<u>7,000</u>
Total	\$538,221	\$327,669 ^b	\$525,400	\$528,600
<u>Civilian Radioactive Waste R&D</u>				
Spent fuel storage R&D	11,389	13,200	-	-
Alternative disposal concepts	10,700	12,000	-	-
Generic methods and supporting studies	19,475	2,174	-	-
Program direction	<u>260</u>	<u>266</u>	-	-
Total	\$ 41,824	\$ 27,640 ^c	-	-
Total	<u>\$580,045</u>	<u>\$355,309</u>	-	-

^aNWPA requires the Secretary of Energy to submit a triennial budget for the Nuclear Waste Fund but not for the Civilian Radioactive Waste R&D Program.

^bThe Congress appropriated this amount for the Nuclear Waste Fund on July 16, 1984 (Public Law 98-360).

^cThis amount, appropriated by the Congress on July 16, 1984 (Public Law 98-360), is subject to general reductions.

ORGANIZATIONS CONTACTED DURING THIS REVIEWDepartment of Energy

Headquarters, Washington, D.C., and Germantown, Maryland
Basalt Waste Isolation Project Office, Richland, Washington
Nevada Nuclear Waste Storage Investigation Office, Las Vegas,
Nevada
Office of Nuclear Waste Isolation, Columbus, Ohio
Crystalline Rock Project Office, Argonne, Illinois

Department of Energy contractors

Rockwell International, Richland, Washington
Battelle Memorial Institute, Columbus, Ohio

Federal agencies

Environmental Protection Agency, Criteria and Standards
Division, Washington, D.C.
Nuclear Regulatory Commission, Division of Waste Management,
Washington, D.C.
U.S. Geological Survey, Reston, Virginia
Department of Treasury, Washington, D.C.
Congressional Budget Office, Washington, D.C.
Office of Technology Assessment, Washington, D.C.

Affected states

Louisiana, Department of Natural Resources, Baton Rouge
Mississippi, Department of Energy and Transportation, Jackson
Nevada, Department of Minerals, Carson City
Texas, Nuclear Waste Programs Office, Austin
Utah, Office of Planning and Budget, Salt Lake City
Washington, Department of Ecology, Olympia

Other organizations

National Governors Association, Washington, D.C.
Edison Electric Institute, Washington, D.C.
National Research Council, Washington, D.C.

SUMMARY OF CONDITIONS WHICH WOULD DISQUALIFY A SITE
FROM SELECTION AS A REPOSITORY LOCATION

I. Postclosure Disqualifying Conditions

1. Geohydrology: A site shall be disqualified if the pre-waste-emplacement ground-water travel time from the disturbed zone to the accessible environment is expected to be less than 1,000 years along any pathway of likely and significant radionuclide travel.
2. Erosion: A site shall be disqualified if site conditions do not allow all portions of the underground facility to be situated at least 200 meters below the directly overlying ground surface.
3. Dissolution: A site shall be disqualified if it is likely that, during the first 10,000 years after closure, active dissolution as predicted on the basis of the geologic record, would result in a loss of waste isolation.
4. Tectonics: A site shall be disqualified if, based on the geologic record during the Quaternary Period, the nature and rates of fault movement or other ground motion are expected to be such that a loss of waste isolation is likely to occur.
5. Natural resources: A site shall be disqualified if
 - (a) Previous exploration, mining, or extraction activities for resources of commercial importance at the site have created significant pathways between the projected underground facility and the accessible environment; or
 - (b) Ongoing or likely future activities to recover presently valuable natural mineral resources outside the controlled area would be expected to lead to an inadvertent loss of waste isolation.

II. Preclosure Disqualifying Conditions

1. Population density and distribution: A site shall be disqualified if:
 - (a) Any surface facility of a repository would be located in a highly populated area; or
 - (b) Any surface facility of a repository would be located adjacent to an area 1 mile by 1 mile having a population of not less than 1,000 individuals as enumerated by the most recent U.S. census; or

- (c) The DOE could not develop an emergency preparedness program which meets the requirements specified in DOE order 5500.3 (Reactor and Non-Reactor Facility Emergency Planning, Preparedness, and Response Program for Department of Energy Operations) and related guides or, when issued by the NRC, in 10 CFR 60, Subpart I, "Emergency Planning Criteria."
2. Offsite installations and operations: A site shall be disqualified if atomic energy defense activities in proximity to the site are expected to conflict irreconcilably with repository siting, construction, operation, closure, or decommissioning.
3. Environmental quality: Any of the following conditions shall disqualify a site:
- (a) During repository siting, construction, operation, closure, or decommissioning the quality of the environment in the affected area could not be adequately protected or projected environmental impacts in the affected area could not be mitigated to an acceptable degree taking into account programmatic, technical, social, economic, and environmental factors.
 - (b) Any part of the restricted area or repository support facilities would be located within the boundaries of a component of the National Park System, the National Wildlife Refuge System, the National Wilderness Preservation System, or the National Wild and Scenic Rivers System.
 - (c) The presence of the restricted area or the repository support facilities would conflict irreconcilably with the previously designated resource-preservation use of a component of the National Park System, the National Wildlife Refuge System, the National Wilderness Preservation System, [or] the National Wild and Scenic Rivers System, or National Forest Lands, or any comparably significant State protected resource that was dedicated to resource preservation at the time of the enactment of the Act.
4. Socioeconomic impacts: A site shall be disqualified if repository construction, operation, or closure would significantly degrade the quality, or significantly reduce the quantity of water from major sources of offsite supplies presently suitable for human consumption or crop irrigation and such impacts cannot be compensated for, or mitigated by, reasonable measures.

5. Rock characteristics: A site shall be disqualified if the rock characteristics are such that the activities associated with repository construction, operation, or closure are predicted to cause significant risk to the health and safety of personnel, taking into account mitigating measures that use reasonably available technology.
6. Hydrology: A site shall be disqualified if, based on expected ground-water conditions, it is likely that engineering measures that are beyond reasonably available technology will be required for exploratory-shaft construction or for repository construction, operation, or closure.
7. Tectonics: A site shall be disqualified if, based on the expected nature and rates of fault movement or other ground motion, it is likely that engineering measures that are beyond reasonably available technology will be required for exploratory-shaft construction or for repository construction, operation, or closure.

Source: DOE final siting guidelines, 49 Fed. Reg. 47714 (1984)
(to be codified at 10 C.F.R. §960)

ESTABLISHING THE NUCLEAR WASTE FUND

Before the Nuclear Waste Policy Act of 1982 (NWPAct), DOE had in place several programs to develop geologic repositories for disposal of civilian high-level radioactive waste. DOE funded these programs through its Energy Supply Research and Development Appropriation account. With the enactment of NWPAct on January 7, 1983, the responsibility for financing the programs was transferred from the federal government to the generators and owners of the high-level waste. Under section 302(d), DOE is authorized to make expenditures for a wide range of activities from the Nuclear Waste Fund (NWF) once such expenditures are approved by the Congress through appropriations.

In anticipation of NWPAct, DOE separated project-specific¹ repository activities in its fiscal year 1983 budget from other related activities so that these activities could be easily transferred upon NWPAct enactment. In separating the activities, DOE assumed that only project-specific activities would be transferred and non-project-specific² activities would remain a federal responsibility that would continue to be financed by the Energy Supply Research and Development Appropriation account. In the fiscal year 1983 budget, DOE requested \$185 million for project-specific repository activities and \$80 million for other non-project-specific commercial waste management activities.

Because NWPAct authorized some non-project-specific costs to be incurred by NWF, DOE had to identify which non-project-specific activities in the fiscal year 1983 budget (such as grants to states, monitored retrievable storage, transportation, treatment and packaging of waste, and administrative cost) should be transferred to NWF. The transfer of the applicable unexpended funds was accomplished in a two-step process. First, DOE identified NWF activities and allowed them to operate through April 30, 1983, with previously allotted appropriated funds. The unallotted balance of \$89.9 million was transferred to NWF on February 9, 1983. DOE had these funds because it was operating under a continuing resolution and had used only a fraction of the annual amount. As the next step, DOE instructed its field offices to determine and transfer the actual amount of unexpended funds from the Energy Supply Research and Development Appropriation account as of

¹Project-specific activities are those leading to site selection, design, licensing, construction, and operation of a specific repository.

²Non-project-specific activities are those activities not dedicated to a specific repository. They include such activities as technology development, waste packaging, and materials characterization.

December 31, 1982.³ DOE headquarters officials then verified the transfers by assuring that NWF's activities had zero balances under the Energy Supply, Research and Development Appropriation. Subsequently, DOE transferred \$154.6 million to NWF on April 21, 1983, and \$9.3 million on July 20, 1983. In commenting on our report, DOE noted that an additional \$4.7 million was transferred in fiscal year 1984. In total, DOE transferred \$258.5 million from the Energy Supply Research and Development Appropriation account to NWF.

Within DOE, the Office of Civilian Radioactive Waste Management (OCRWM) is primarily responsible for budgeting NWF's expenditures, which will be submitted to the Congress as part of DOE's overall budget. Generally, congressional control levels, as contained in the appropriation bills and accompanying committee reports, will determine the allocation of funds appropriated by the Congress. Once allotted, the obligations of funds will be based on a document called the Approved Financial Program (AFP) that is prepared in accordance with DOE's Budget Manual. Field offices and contractors must submit requests for proposals to change the AFP, which must be approved by OCRWM. If approved, a tentative change to the AFP is implemented and transmitted to the field office. Changes to the AFP must also be submitted to DOE's Office of the Controller for review and, if approved, communicated to the field.

Accounting for NWF will be accomplished through DOE's Office of the Controller. Within this office, the Office of Financial Policy will determine accounting policy while the Office of Headquarters Accounting Operations performs the actual accounting for the collection of fees and for contract disbursements, payroll, travel, allocation of overhead and other indirect costs, and depreciation initiated at headquarters. Accounting will be done on an accrual basis.

NWF is part of DOE's large and complex accounting system called the Financial Information System (FIS). The FIS includes more than 20 major accounting systems that consolidate data from more than 50 integrated contractor accounting systems. More than 80 entities throughout the country, including major contractors and field offices under NWF, account and report summary data directly or indirectly through the FIS.

³DOE used December 31, 1982, rather than January 1983 because its accounting system is designed to show costs on a monthly basis.

OVERVIEW OF ASSIGNED RESPONSIBILITIES WITHIN THE
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

This appendix presents an overview of the specific assignment of responsibilities within the Office of Civilian Radioactive Waste Management (OCRWM). The descriptions were excerpted from functional statements for each organizational component of OCRWM which became effective in October 1984.

OFFICE OF THE DIRECTOR

"The Office of the Director, OCRWM, is the DOE component charged with implementation of the Nuclear Waste Policy Act, P.L. 97-425. Its mission is to provide for the development of repositories for the disposal of high-level radioactive waste and spent nuclear fuel, including the development of interim storage capabilities prior to the availability of a repository for permanent disposal, in a manner that fully protects the public health and safety and is in accordance with the NWPA of 1982."

"The Office discharges its responsibilities through an Office of Policy, Integration, and Outreach and three offices, headed by Associate Directors, as follows:

- Office of Resource Management,
- Office of Geologic Repositories, and
- Office of Storage and Transportation Systems."

OFFICE OF POLICY, INTEGRATION, AND OUTREACH

"The Office of Policy, Integration, and Outreach has primary responsibilities within OCRWM for providing central staff support to the Director, OCRWM in policy formulation, program planning and general oversight of program execution actions. Evaluates program accomplishments and assures integration of Headquarters and field activities. In addition, the Office independently monitors program interaction with external interests to observe effectiveness and quality of policy implementation. The Office also coordinates communications, public relations and institutional relations policy development and implementation for the Office of Civilian Radioactive Waste Management. The Office is organized as follows:

- Policy Division,
- Program Integration Division, and
- Outreach Division."

Policy Division

"The Policy Division is responsible within OCRWM for program policy formulation and policy guidance at Headquarters and field project offices. The Division is also responsible for the coordination, preparation and submission of the Congressionally mandated Mission Plan, Annual Report, and other special cross-cutting reports. In addition, the Division assesses program accomplishments and identifies issues with the potential for having an adverse impact on the OCRWM program."

Program Integration Division

"The Program Integration Division is responsible for program planning and general oversight of program execution actions; assures clear understanding through observation and evaluation of interrelationships of program goals and accountability; and provides quality assurance for OCRWM. The Division is also responsible for informing Director, OCRWM, of quality of performance and accomplishments of OCRWM staff."

Outreach Division

"The Outreach Division is responsible for the development, analysis, coordination and integration of OCRWM institutional and external relations policy. The Division also provides for a communications mechanism for the dissemination of program information. Stays cognizant of current program and plans to anticipate public information needs."

OFFICE OF RESOURCE MANAGEMENT

"The Office of Resource Management has primary responsibility within OCRWM for development, implementation, and maintenance of an OCRWM-wide program management system (PMS) and for the proper management and administration of the Nuclear Waste Fund and Interim Storage Fund. Fund management responsibilities include activities related to fee collection and payment procedures, establishment of methods for review and the actual performance of an annual review to determine fee adequacy, management of contracts for disposal and interim storage services, preparation and execution of OCRWM budgets, fund control and accounting activities, management of information and data systems, preparation of management studies of alternative means of financing, and provision of management support services to OCRWM. The Office also has responsibility for contract management and procurement support activities. The Office is organized as follows:

- Finance and Cost Analysis Division, and
- Management Support Division."

Finance and Cost Analysis Division

"The Finance and Cost Analysis Division is responsible within OCRWM for the management of all fee adequacy and total system life-cycle cost analyses, and all budgeting, accounting and auditing activities related to the Civilian Radioactive Waste Management Program, and specifically for the administration of the Nuclear Waste Fund, Interim Storage Fund and all other accounts associated with the program."

Management Systems and Support Division

"The Management Systems and Support Division is responsible within OCRWM for all management systems, management planning and management support activities that cut across programmatic areas and issues. It develops, implements, and maintains an OCRWM-wide program management system (PMS), and coordinates the development of all resource requirements, other than the formulation of budgets. The Division also provides centralized management support services in the areas of organization planning; staffing; management information systems; mail, correspondence and classified documents control; and general administration. The Division is also responsible for contract management and procurement support activities."

OFFICE OF GEOLOGIC REPOSITORIES

"The Office of Geologic Repositories has primary responsibility within OCRWM for site screening and characterization of both existing and potential geologic repository sites; preliminary and final site selection; design and construction of exploratory shafts; evaluation of regulatory requirements; design, development, licensing, construction, operation and decommissioning of mined geologic repositories; design, development, siting, licensing, construction and operation of a test-and-evaluation facility (TEF); management of RD&D activities for both repositories and other means of permanent disposal; and management and coordination of safety, quality assurance and standards activities for the geologic repository deployment sub-program. In carrying out its functions, the Office interacts, develops agreements, and coordinates its activities with State and local governments, Indian tribal councils, other Federal agencies, and DOE field offices. The Office is organized as follows:

- Repository Coordination Division;
- Engineering and Licensing Division;
- Geosciences and Technology Division, and
- Siting Division."

Repository Coordination Division

"The Repository Coordination Division provides program policy guidance, oversight, coordination, and control of field project

office activities for the geologic repository sub-program. It is responsible for day-to-day contact and interaction with the project offices in the proper allocation of resources, management and tracking of activities, program plans, strategies and schedules. The Division also prepares geologic repository portions of required reports and plans and coordinates international activities related to the geologic repository deployment sub-program."

Engineering and Licensing Division

"The Engineering and Licensing Division provides management, coordination and review of engineering, design, construction and operation activities for the geologic repository deployment sub-program. The Division also manages and coordinates systems engineering, performance and cost studies and maintains liaison with the Office of the Assistant Secretary for Defense Programs and the Associate Director for Storage and Transportation Systems."

Geosciences and Technology Division

"The Geosciences and Technology Division provides oversight, coordination, and management for site characterization plans, geohydrologic, geochemical, rock properties and site tectonics testing and assessments. The Division also coordinates the at-depth testing program, maintains liaison with USGS [U.S. Geological Survey], manages evaluations of alternative disposal options and is responsible for repository system performance assessments."

Siting Division

"The Siting Division manages the development and application of site screening guidelines, coordinates preparation of all required documents, interfaces with States, local governments and Indian tribes and participates in socioeconomic impact mitigation planning. The Division also provides liaison with other Federal agencies in the siting process and manages a consultation and cooperation and licensing record and document system."

OFFICE OF STORAGE AND TRANSPORTATION SYSTEMS

"The Office of Storage and Transportation Systems has primary responsibility within OCRWM for the implementation of subtitles B and C, Title I, and Sections 218 and 220, Title II, P.L. 97-425, and other activities related to the interim or long-term storage of SNF [spent nuclear fuel] and HLW [high-level waste], including waste packaging, handling and transportation technologies. Major projects include provision of any needed Federal interim storage facilities and preparation of a Congressionally mandated proposal for the construction of one or more Monitored Retrievable Storage (MRS) facilities for long-term storage of HLW and SNF as a backup capability for mined geologic repositories, SNF storage and disposal, international cooperation programs and development of packaging and transportation systems. The Office also encourages and

expedites, through a joint demonstration program and R&D efforts, civilian at-reactor storage of SNF, and assists in licensing various SNF storage options."

"The Office is responsible for providing storage to a limit of 1,900 metric tons upon NRC determination of the need for Federal storage facilities. Development of this capability entails planning studies, site identification, facility design and development, licensing interactions, and consultations with field offices, State and local governments, Indian tribes, and other interested parties. The Office is responsible for planning and submitting to Congress a proposal with site-specific designs for MRS facilities. Upon congressional approval to construct one or more MRS facilities, the Office is responsible for proceeding with site selection, licensing, preparation of an environmental impact statement, and facility construction and operation. The Office also plans, coordinates and administers, up to the point of acceptance by the repository, DOE's responsibilities for waste package, storage and transportation activities for civilian nuclear wastes. The Office is organized as follows:

--Storage Division, and

--Transportation and Waste Systems Division."

Storage Division

"The Storage Division plans, coordinates and oversees all activities relating to the provision of any Monitored Retrievable Storage (MRS) and Federal Interim Storage (FIS) facilities for high-level radioactive waste and spent nuclear fuel, as mandated by Subtitles B and C, Title I, and Section 220, Title II, P.L. 97-425."

Transportation and Waste Systems Division

"The Transportation and Waste Systems Division coordinates and manages implementation of DOE responsibilities for the transportation of spent nuclear fuel under Section 137, Title I, and the spent fuel R&D activities mandated by Section 218, Title II of P.L. 97-425."

SUMMARY OF CONTRACT FUNDING
FOR FIELD REPOSITORY PROJECTS
DURING FISCAL YEAR 1983

	<u>Amount</u> <u>obligated</u>	<u>Subcontracts</u> <u>Number</u>	<u>Amount</u> <u>obligated</u>	<u>Total</u> <u>obligations</u>
	-(000 omitted)-		----- (000 omitted) ----	
<u>SALT REPOSITORY</u>				
<u>PROJECT OFFICE</u>				
Primary project contractor:				
Battelle Memorial Institute	\$ 57,795	38	\$ 36,268	\$ 94,063
National laboratories:				
Argonne	990			990
Brookhaven	250			250
Los Alamos	130			130
Sandia	350			350
Lawrence Berkeley	353			353
Lawrence Livermore	490			490
Oak Ridge	325	1	63	388
Pacific Northwest	2,538			2,538
Other prime contracts:				
Corps of Engineers Decision Planning Corp.	238			238
Grand Junctions Operations, Bendix Field Engineering	500			500
Hanford Engineering Development Laboratory	929	1	50	979
Maxima Corp.	60			60
Parson-Redpath	33			33
Texas Bureau of Economic Geology	2,200			2,200
U.S. Geological Survey	2,300	2	77	2,377
Science Applications	825			825
	167			167
Total	\$ <u>70,473</u>	<u>42</u>	\$ <u>36,458</u>	\$ <u>106,931</u>

	<u>Amount obligated</u>	<u>Number</u>	<u>Subcontracts Amount obligated</u>	<u>Total obligations</u>
	-(000 omitted)-		----- (000 omitted) -----	
<u>NEVADA NUCLEAR WASTE STORAGE INVESTI- GATIONS (TUFF)</u>				
Primary project contractor: None				
National laboratories:				
Lawrence Livermore	\$ 6,428	9	\$ 1,172	\$ 7,600
Los Alamos	6,798	3	202	7,000
Sandia	11,177	24	5,723	16,900
Other prime contractors:				
EG&G, Idaho, Inc.	75			75
Fenix and Scissor	1,688	5	1,905	3,593
Holmes and Narver	1,525			1,525
Pan American Services	61			61
Reynolds Electric and Engineering, Inc.	16,786	3	851	17,637
Science Applications	2,800			2,800
Wackenhut Services, Inc.	184			184
U.S. Geological Survey	5,510	1	70	5,580
University of Nevada	156			156
Total	\$ <u>53,188</u>	<u>45</u>	\$ <u>9,923</u>	\$ <u>63,111</u>

BASALT WASTE
ISOLATION PROJECT

Primary project contractor: Rockwell Hanford Operations				
	24,844	77	14,076	38,920
National laboratories:				
Pacific Northwest	1,700			1,700

	<u>Amount obligated</u>	<u>Subcontracts</u>		<u>Total obligations</u>
		<u>Number</u>	<u>Amount obligated</u>	
	-(000 omitted)-		-----	(000 omitted)----
Other prime contractors:				
Morrison Knudsen	\$ 8,909	4	\$ 2,481	\$ 11,390
Raymond Kaiser Engineers	4,000			4,000
Westinghouse Hanford Company	1,396	7	404	1,800
Total	<u>\$ 40,849</u>	<u>88</u>	<u>\$ 16,961</u>	<u>\$ 57,810</u>
Total	<u>\$164,510</u>	<u>175</u>	<u>\$ 63,342</u>	<u>\$227,852</u>



Department of Energy
Washington, D.C. 20585

SEP 20 1984

Mr. J. Dexter Peach
Director, Resources, Community and
Economic Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Peach:

The Department of Energy (DOE) appreciates the opportunity to review and comment on the General Accounting Office (GAO) draft report entitled, "Department of Energy's Initial Efforts to Implement the Nuclear Waste Policy Act of 1982" (GAO/RCED-84-181).

The Department believes that the report presents a fair and balanced assessment of DOE's progress in implementing the Act. It contains a series of helpful suggestions and recommendations which are already under study by DOE's Office of Civilian Radioactive Waste Management. In particular, that Office is in the process of developing an integrated program management system and is exploring alternatives to improve the program's revenue stream.

A careful review of the GAO draft report has not surfaced any substantive comments that warrant consideration for inclusion in the final report. A series of non-substantive and editorial comments, that serve the sole purpose of enhancing the accuracy and clarity of the document, are being transmitted separately to Mr. William McGee of your staff. DOE hopes that these comments will be helpful to GAO in the preparation of the final report.

Sincerely,

A handwritten signature in cursive script, appearing to read "M. H. Dolan".

Martha Hesse Dolan
Assistant Secretary
Management and Administration

GAO Note: Based on additional specific materials and comments provided by DOE, the report was revised where appropriate, to recognize more current events, DOE's views on certain matters, and incorporate DOE's non-substantive and editorial comments.



DEPARTMENT OF THE TREASURY

WASHINGTON, D.C. 20220

ASSISTANT SECRETARY

September 18, 1984

Dear Mr. Anderson:

This is in response to your request for the Department's views on the draft GAO report titled the "Department of Energy's Initial Efforts to Implement the Nuclear Waste Policy Act of 1982" (Code 301606).

Under the Nuclear Waste Policy Act of 1982, the Department of Energy (DOE) is required to develop permanent nuclear waste disposal facilities ("geologic repositories"). The cost of constructing and maintaining these repositories is to be covered by fees paid by the generators and owners of highly radioactive wastes who will use such disposal facilities. The Act also requires that GAO annually audit DOE's efforts to develop the repositories. The results of GAO's first such audit are presented in the draft report.

GAO recommends in the draft report that the Secretary of Energy fully evaluate ways to collect fees more promptly from all anticipated repository users. Based on an analysis of DOE's fee collection procedures or plans, GAO identifies several ways in which DOE might be able to accelerate the payment of such fees by certain expected repository users. Specifically, DOE could seek (1) to accelerate payments by utilities generating nuclear electricity by instituting monthly, rather than quarterly, payment periods; (2) to require that deferred payments be subject to commercial, rather than Treasury, interest rates; (3) to obtain appropriations to begin payments in fiscal year 1986 for the disposal of defense high-level waste owned by DOE, if the President does not decide that a separate repository for such defense waste is required; and (4) to require amounts held by New York State for the "perpetual care" of the high-level waste owned by that State be promptly deposited in the Nuclear Waste Fund.

In my enclosed February 9, 1984 letter to Mr. McGee, I presented the Department's views concerning the interest rates which the Department of Energy proposes to apply to deferred payments of fees under its standard contract for the disposal of spent nuclear fuel and/or high-level radioactive wastes under the Nuclear Waste Policy Act of 1982. As indicated in that letter, using a rate based on the cost of commercial borrowing to determine interest on deferred payments of the disposal fees would be preferable to using current market yields on outstanding Treasury securities. We, therefore, strongly support GAO's recommendation that DOE require that the deferred payments be subject to commercial, rather than Treasury, interest rates.

- 2 -

We have no objection to the other recommendations that GAO makes to the Secretary of Energy in the draft report concerning ways to accelerate the payment of the disposal fees by certain expected repository users.

I hope that this information is helpful.

Sincerely,



Thomas J. Healey
Assistant Secretary
(Domestic Finance)

Mr. William J. Anderson
Director
General Government Division
U.S. General Accounting Office
Washington, D.C. 20548

Enclosure (GAO Note)

GAO Note: Enclosure is not included because the substance of Treasury's letter to GAO is already presented in chapter 3.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SEP 24 1984

Mr. J. Dexter Peach, Director
Resources, Community and Economic
Development Division
U.S. General Accounting Office
441 G. Street NW
Washington DC 20548

Dear Mr. Peach:

Enclosed are several comments from the NRC staff on the draft of the proposed General Accounting Office report, Department Of Energy's Initial Efforts To Implement The Nuclear Waste Policy Act Of 1982 (Code 301606). Overall we agree with the conclusion that the Department of Energy (DOE) has made significant progress in implementing major actions required by the Act during 1983.

If we can be of further assistance please contact Robert E. Browning, Director, Division of Waste Management, 427-4069.

Sincerely,

A handwritten signature in dark ink, appearing to read "William J. Dircks".

William J. Dircks
Executive Director for Operations

Enclosure: (GAO Note)
Staff Comments

GAO Note: Where appropriate we revised the report to note
NRC's specific comments.

(301606)





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