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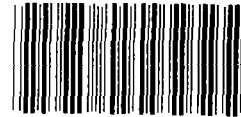
GAO

Fact Sheet for Congressional Requesters

November 1987

NUCLEAR WASTE

Quarterly Report on DOE's Nuclear Waste Program as of September 30, 1987



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United States
General Accounting Office
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Resources, Community, and
Economic Development Division

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November 19, 1987

The Honorable J. Bennett Johnston
Chairman, Committee on Energy
and Natural Resources
United States Senate

The Honorable James A. McClure
Ranking Minority Member
Committee on Energy and Natural Resources
United States Senate

On March 26, 1984, you requested that we provide quarterly status reports on the Department of Energy's (DOE) implementation of its nuclear waste program. The Nuclear Waste Policy Act of 1982 (Public Law 97-425) established a national program and policy for safely storing, transporting, and disposing of nuclear waste. As part of this program, the act requires DOE to develop, schedule, site, and construct a geologic repository for the permanent disposal of high-level radioactive nuclear waste. In May 1986 DOE recommended and the President approved three candidate repository sites for detailed testing (site characterization)--Yucca Mountain, Nevada; Deaf Smith County, Texas; and Hanford, Washington.

The act also requires DOE to carry out siting and development activities for a second repository; however, DOE must obtain congressional authorization before constructing such a facility. The act also established within DOE the Office of Civilian Radioactive Waste Management to carry out the act's provisions and established the Nuclear Waste Fund to finance the program.

This fact sheet provides the status of DOE's nuclear waste program activities for the quarter ending September 30, 1987.

During this quarter DOE's primary efforts focused on preparing draft site characterization plans for each candidate first repository site. The objective of these plans is to detail the steps DOE would take to obtain

geologic and environmental data for each site. DOE intended to issue the plans separately for Yucca Mountain and Hanford in September or October 1987 and the Deaf Smith plan in early 1988; however, DOE revised the release dates partly in response to affected states' and Indian tribes' concerns about not having enough time to review and comment on the plans and partly because it decided to issue all three plans simultaneously.

DOE now intends to simultaneously release all three plans as consultation drafts in January 1988 and hold consultation workshops with state, Indian tribe, and Nuclear Regulatory Commission representatives through March 1988. DOE also intends to release environmental and socioeconomic monitoring and mitigation plans concurrently with the site characterization plans so that a total picture of detailed testing activities will be available. After the workshops, DOE intends to revise the plans on a schedule to be determined by the results of the consultation workshops. Subsequently, there will be a 90-day period for public review of the revised plans, as well as a 6-month period for review and preparation of a site characterization analysis by the Nuclear Regulatory Commission.

During this quarter officials from the state of Washington and Indian tribes expressed concern that DOE's study process may not provide for early identification, examination, and resolution of potential disqualifying conditions at the Hanford site. In the past, officials from the states of Nevada and Texas have pointed out several technical issues that need to be resolved during site characterization. DOE's siting guidelines provide that a site can be disqualified at any time; however, the draft site characterization plans will not contain key decision points at which DOE will formally consider whether it should disqualify a candidate site. DOE believes that the site characterization process implicitly requires that certain issues be resolved before continuing detailed testing.

State of Washington and Yakima Indian Nation representatives told us that they believe DOE's program milestones are optimistic. Officials at DOE's Yucca Mountain and Deaf Smith project offices believe that, with adequate funding and no significant technical setbacks, current site characterization milestones can be met. One

official, however, expressed concern that certain unpredictable factors, such as the adequacy and timeliness of funding, could adversely affect work progress. For example, DOE backed up the date for starting exploratory shaft drilling at Hanford by 6 months because, among other things, it needed more time to obtain certain drilling permits from Washington. DOE plans to start drilling exploratory shafts at the Hanford site in the second quarter of 1989, at the Yucca Mountain site in the last quarter of 1988, and at the Deaf Smith site in the last quarter of 1989.

Because the Congress did not act on DOE's request to explicitly approve the Secretary of Energy's May 1986 decision to delay site-specific work for a second repository and begin in 1995 a national survey of potential second repository sites, the Secretary announced on October 1, 1987, that work on the second repository would be resumed. For the most part, this work will consist of DOE reviewing comments on 20 areas that it had identified as having potentially acceptable second repository sites.

During this quarter and in October 1987, hearings were held on several bills aimed at redirecting or significantly changing the nuclear waste management program. Section 2 of this fact sheet provides a brief summary of the bills and DOE's position on proposed legislative changes.

The Nuclear Waste Fund received about \$140 million in fees and investment income during the quarter, and DOE obligated about \$72 million for program activities. The fund balance as of September 30, 1987, was about \$1.5 billion.

To determine the status of the activities discussed in this fact sheet, we interviewed DOE officials who are responsible for planning and managing the waste program, responding to litigation, and managing the program's financial activities. We also relied on information we provided in a fact sheet on DOE's site characterization activities.¹ Specifically, we

¹Nuclear Waste: Status of DOE's Nuclear Waste Site Characterization Activities (GAO/RCED-87-103FS, March 20, 1987).

used information obtained prior to this quarter from states and DOE officials regarding some technical issues that have been raised regarding the site characterization process. We also obtained information from project office officials of the three candidate sites in Nevada, Texas, and Washington, respectively. We reviewed DOE program documents, correspondence, studies, related legal documents, and financial data. We did not verify DOE's financial system data because this verification could not be accomplished within the time frame of this review and because this information is audited annually by a private certified public accounting firm.

We discussed the facts presented with cognizant DOE officials and incorporated their views where appropriate. DOE officials told us that the fact sheet accurately reflects the program's status for the quarter ending September 30, 1987.

We are sending copies of the fact sheet to the Chairmen of the Senate Committee on Governmental Affairs, the House Committee on Government Operations, and the House Committee on Energy and Commerce; the Secretary of Energy; the Chairman, Nuclear Regulatory Commission; and other interested parties. If you have further questions, please contact me at (202) 275-1441.

Major contributors are listed in appendix II.



Keith O. Fultz
Associate Director

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ABBREVIATIONS

DOE Department of Energy
EPA Environmental Protection Agency
GAO General Accounting Office
MRS monitored retrievable storage
NRC Nuclear Regulatory Commission
NWPA Nuclear Waste Policy Act
OCRWM Office of Civilian Radioactive Waste Management
SCP site characterization plan

SECTION 1

OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

ACTIVITIES DIRECTED TOWARD LEGISLATIVE

REQUIREMENTS DURING THE JULY-SEPTEMBER 1987 QUARTER

BACKGROUND

The Nuclear Waste Policy Act of 1982 (NWP) established a federal program and policy for high-level radioactive nuclear waste management. NWP's ultimate objective is the safe and permanent disposal of nuclear waste in geologic repositories. NWP required, under a detailed process and schedule, that the Department of Energy (DOE) develop, site, construct, and operate one repository and select a site for a second repository. In addition, NWP stipulates that DOE is to consult and cooperate with states and Indian tribes to promote their confidence in the program's safety. DOE has contracted with utilities to accept waste for disposal by January 31, 1998. To finance the program, NWP established the Nuclear Waste Fund, which receives fees from waste owners and generators. Under various assumptions, the estimated cost of the program is between \$28 billion and \$38 billion (constant 1986 dollars).

As required by NWP, in May 1986, DOE recommended to the President three candidate first repository sites for further geologic testing (site characterization). On May 28, 1986, the President approved the three sites--Yucca Mountain, Nevada; Deaf Smith County, Texas; and Hanford, Washington. DOE estimates that the site characterization phase will last from about 5 to 7 years. On the basis of the results of site characterization, DOE plans to select one of the three sites for a nuclear waste repository. In September 1987, we reported that when the effect of future inflation is considered, site characterization costs are about \$5.8 billion for the three sites.¹

NWP also required DOE to recommend to the President by July 1, 1989, three sites for second-repository site characterization; however, DOE does not plan to meet the 1989

¹See Nuclear Waste: Information on Cost Growth in Site Characterization Cost Estimates (GAO/RCED-87-200FS, Sept. 10, 1987).

deadline.² On May 28, 1986, DOE postponed its second repository site-specific work because of progress with the first repository program and questions as to when a second repository would be needed. However, because the Congress did not explicitly approve the Secretary of Energy's decision to postpone work on the second repository, on October 1, 1987, the Secretary advised the governors of 17 states, previously identified by DOE through a draft area recommendation report as having potential candidate sites, that DOE has resumed site-specific activities for a second repository. Over the next 12 to 18 months DOE plans to resume preparation of the final area recommendation report.

NWPA also required DOE to study the need for and feasibility of, and to submit a proposal for, a monitored retrievable storage (MRS) facility where nuclear waste could be stored, monitored, and subsequently retrieved for permanent disposal in a repository. On March 31, 1987, DOE submitted its MRS proposal to the Congress, recommending that a MRS facility be built at the former Clinch River Breeder Reactor site in Oak Ridge, Tennessee. DOE believes that the proposed MRS facility should be an integral part of the nuclear waste management system. As of October 31, 1987, the Congress had not approved the proposal.

STATUS OF THE WASTE MANAGEMENT PROGRAM

During the fourth quarter of fiscal year 1987, DOE's primary waste management program emphasis was on preparing site characterization plans for public comment on each candidate first repository site. DOE also issued several key program documents and completed or initiated other program actions that are highlighted at the end of this section.

In September 1987, the Senate Committee on Appropriations reported to the Senate H.R. 2700, the Energy and Water Development Appropriations Bill of 1988. In its report, the Committee recommended that appropriations for the waste management program be set at \$360 million in fiscal year 1988 (\$140 million less than the House of Representatives recommended in June 1987 and DOE requested in February 1987). The Committee pointed out that the \$360 million is intended to allow DOE to proceed toward construction of a MRS facility, to select a single site for characterization, and to provide benefit payments with respect to a repository or MRS, according to the provisions of a bill--S. 1668--that was introduced on September 1, 1987. Section 2 of this fact sheet provides a brief summary of this bill and DOE's position on the bill's

²In an opinion dated September 12, 1986, we concluded that unless the Congress acts to change this deadline, DOE's failure to meet the deadline will violate the law, although, under NWPA, no penalty or other legal consequence will flow from this failure.

provisions. The Committee recognized that its recommendation assumes legislation will be enacted directing DOE to construct a MRS facility and to characterize candidate sites sequentially, rather than in parallel as provided for in NWPA. The Committee noted, however, that if this particular legislation is not enacted, DOE believes that significant additional resources will be required to carry out the program in fiscal year 1988. These additional funds would be necessary to initiate site characterization for the three candidate sites.

DOE PLANNING FOR SITE CHARACTERIZATION

The site characterization phase of the waste management program began immediately following the President's approval of the three candidate sites in May 1986. The main objectives of site characterization are to (1) determine if a candidate site will provide safe and permanent disposal for nuclear waste, (2) develop data to be used in the decision process to determine which site the Secretary of Energy should recommend as the first site if DOE judges more than one of the candidate sites to be suitable, and (3) collect the data and information needed to support a construction license application to the Nuclear Regulatory Commission (NRC) at the end of the site characterization phase. Site characterization field testing consists of surface-based tests (e.g., geologic mapping and seismic surveys) and tests conducted below the surface. Several site characterization field testing activities were in process when the President approved the three candidate sites--for example, daily and weekly monitoring of groundwater boreholes at Hanford and seismic and hydrologic monitoring of drill holes and trenches at Yucca Mountain. DOE has not begun performing field tests at the Deaf Smith site because the site is on privately owned land.

NWPA requires DOE to prepare a site characterization plan (SCP) before beginning to sink exploratory shafts at any candidate repository site. The SCPs are intended to be umbrella documents that will (1) provide mechanisms for identifying the specific issues at a proposed repository site and (2) identify specific research needed to obtain data for resolving those issues early to avoid repository licensing delays. As a result, the plans will become the focus for discussions with NRC on site-specific issues and test programs during the site characterization phase. Each of the SCPs will be presented in two parts: Part A (chs. 1-7) is to describe the site, waste package, and repository design, and Part B (ch. 8) is to describe the site characterization program, including the issues to be resolved, information needed, planned tests and analyses, milestones, and quality assurance program.

SCPs are also required by NRC regulations for the disposal of high-level waste. NWPA also requires DOE to provide the SCPs to NRC for review and comment before shaft construction. DOE planned to begin exploratory shaft construction at either the Hanford or

the Yucca Mountain site in fiscal year 1987 but did not because of a recommendation in the conference report accompanying the 1987 appropriation act that DOE not use funds for shaft construction in that fiscal year.

Site Characterization Plan Release Dates Have Been Revised

During this quarter, DOE announced that it will issue the SCPs for all three sites simultaneously in January 1988 as consultation drafts. DOE's previous schedule called for sequential release of the plans starting in late 1987. Under the revised approach, DOE plans to conduct consultation workshops during January, February, and March 1988 with state, Indian tribe, and NRC representatives. DOE believes that these workshops should provide a forum to explain the documents, address and resolve issues to the extent possible, and receive questions and comments. DOE will close out the consultation period and, after considering comments, prepare the SCPs with a scheduled plan completion date determined by the results of the consultation period. DOE anticipates issuing the SCPs in January 1989. Subsequently, there will be a 90-day public review with public hearings, as required by NHPA, as well as NRC's 6-month period for review and preparation of a site characterization analysis.

STATE AND INDIAN TRIBE CONCERNS REGARDING SITE CHARACTERIZATION

DOE's repository siting guidelines present the basis and provide the criteria for evaluating the suitability of sites for the development of repositories. The guidelines set forth disqualifying and qualifying conditions as well as potentially adverse and favorable conditions that are to be considered in DOE's evaluation of candidate repository sites. These conditions apply to expected performance either before or after the repository is closed. The guidelines list several specific conditions in technical areas that, if found, could disqualify a site from further consideration. For example, a site would be disqualified under the technical area of geohydrology if the groundwater travel time from the disturbed zone³ to the accessible environment, such as surface land or water, is expected to be less than 1,000 years along any pathway of likely and significant radionuclide travel after a repository is closed.

During this quarter, state of Washington and Yakima Indian Nation officials expressed concern that the site characterization process may not result in early identification, examination, and resolution of potential disqualifying conditions before site

³The areas that could be significantly affected by the construction of the underground repository, excluding shafts.

characterization is completed. Specifically, these officials question whether DOE's SCP for the Hanford site will be designed so that potential disqualifying conditions will be identified and investigated at the earliest possible time with the least expenditure of money. Nevada and Texas officials previously have expressed concerns regarding the technical suitability of the respective sites in their states.

At Hanford, the basalt rock formation that is being considered for a repository lies about 3,000 feet deep. Because the rock is below the water table and is saturated, the state of Washington, the Nez Perce Tribe, and the Confederated Tribes of the Umatilla Indian Reservation representatives commented that radioactive materials could be released through groundwater movement. They believe this potential condition, if proven, would disqualify the Hanford site. The state's representatives said that this disqualifying condition has not been proven at the site, but they believe that it will. Representatives from Washington and the Nez Perce tribe cited a January 1987 NRC-consultant report which stated that there is a significant likelihood that the site will not meet the 1,000 year groundwater travel time criterion. However, after reviewing the report, NRC concluded in a March 1987 letter to DOE that it is premature to place a significant amount of credibility on any current estimate of groundwater travel time until additional data have been collected. NRC also noted that the purpose of DOE hydrologic testing during site characterization is to collect this additional data.

Another frequently discussed potential disqualifying condition at Hanford is natural resources; specifically the possible existence of underground natural gas in the vicinity of the proposed repository. State and tribal representatives commented that this condition had not been proven at the Hanford site, but said that the potential does exist. The Nez Perce nuclear waste program manager said that a tribal consultant had detected, and the tribe had publicly exposed, the potential presence of natural gases. State of Washington officials cited a 1986 state study done by its Division of Geology and Earth Resources, Department of Natural Resources, which stated that 40 billion to 1 trillion cubic feet of gas per trap could be present at Hanford in the vicinity of the proposed repository.

The report also stated that the potential for natural gas reserves of this magnitude is the reason Shell Oil Company and other private enterprises continue with difficult and expensive gas exploration in the Columbia Basin, which includes the Hanford site. However, the report concluded that additional detailed studies were needed before anyone would know if the site will meet the siting guidelines. The acting DOE director for the Hanford repository project said that this report was based on a very cursory analysis of the geologic conditions. He also said that DOE agrees that additional detailed studies are needed to determine the potential

for natural gas accumulation at the site, and that DOE is developing study plans in conjunction with the SCP to evaluate this condition.

Yakima Indian Nation and Washington nuclear waste program officials said that Hanford's rock characteristics are an important potential disqualifying condition. Both parties believe that rock stress in the basalt formation at Hanford could affect constructibility of the repository. Rock stress could cause rock bursts which would affect workers' safety. State of Washington officials also told us that methane gas present in the basalt could collect in unventilated areas and cause worker asphyxiation or an explosion. The acting repository project director said that the exploratory shaft facility and the repository are being designed to evaluate and accommodate the range of anticipated rock stress and natural gas conditions. He also said that these types of conditions have been encountered and safely accommodated in commercial mining.

At the Yucca Mountain site, the primary technical issue raised by the state concerns potential faulting and seismicity. Nevada officials believe that there is a possibility of radionuclide movement or release from the repository through groundwater along pathways caused by geologic faults. These officials also believe that the site is geologically unsafe due to potential earthquakes. If an earthquake occurs, the faults could become water conduits to the repository and the groundwater could then become contaminated. DOE officials maintain that the state's conclusions are based on studies of surrounding higher areas that have snow-capped mountains producing large amounts of water infiltration.

DOE believes that another technical issue regarding the Yucca Mountain site is the degree of care needed to ensure that testing does not alter the characteristics of the host rock or scientific measurements. DOE officials said that DOE's contractors must be careful not to change the natural conditions of the unsaturated rock zone where tests will be conducted.

Unlike the other two sites, no on-site technical studies have been conducted at Deaf Smith, although some regional data have been collected. At Deaf Smith, the state of Texas' and other affected parties' primary technical concern is that the Ogallala and Dockum aquifers could be contaminated during the construction of shafts for site characterization. These aquifers provide irrigation water for the region's agricultural production. The proposed repository would be about 1,000 feet beneath the Dockum aquifer and 2,000 feet beneath the Ogallala aquifer. DOE plans to avoid contaminating the aquifers by using a ground freezing technique when the shafts are drilled. According to DOE, this technique would control water migration and stabilize the ground sufficiently to drill the shaft.

Suggestions for Proving
the Existence of
Disqualifying Conditions

The state of Washington has made a specific proposal for proving or disproving the existence of conditions that it believes have the potential to disqualify Hanford. This proposal, which the state says requires a minimum amount of time and money, pertains to the issues of groundwater movement and underground natural gas pockets. The state plans to hire a private contractor, under a DOE grant, to perform the proposed work.

On June 8, 1987, Washington submitted a \$20,000 budget grant revision to DOE's Richland operations office requesting that the state's Department of Natural Resources be allowed to prepare a detailed scope of work for performing repository-related deep seismic exploration at Hanford. The proposed work has two principal objectives: (1) direct exploration of deep structures, particularly faulting and (2) the evaluation of sub-basalt sediments that may contain reservoirs of natural gas. State nuclear waste program officials estimated that the proposed work would cost less than \$10 million and would provide the data to prove or disprove the natural resource and geohydrology disqualifying conditions. On October 9, 1987, DOE advised us that the \$20,000 planning effort had been funded.

Washington nuclear waste program officials said that since seismic and photo-lineament⁴ data suggest that the Hanford repository site is bounded by four faults, slant drilling should be done to locate the suspected faults. According to the officials, this work would cost under \$10 million, take up to a year to complete, and provide the data to prove or disprove the natural resources and geohydrology disqualifying conditions.

Washington and Yakima Indian Nation nuclear waste program officials told us that DOE's pre-exploratory shaft hydrology program should include tests at multiple well locations. According to these officials, this type of testing was one of five options that DOE presented at an April 7-9, 1987, meeting with NRC and the affected parties in Richland, Washington. According to DOE, this option would have been the lowest risk option but would have caused major delays in the exploratory shaft schedule and would have been very expensive. Consequently, DOE selected the next lowest risk option since it would give the best opportunity for satisfying the pre-exploratory shaft testing program without major delays in other components of site characterization. A DOE hydrologist estimated that the multiple well location option would have taken an additional 5 years. NRC and U.S. Geological Survey officials

⁴Alignment of features on an image such as radar or a photograph that will suggest geological origin.

present at the meeting agreed that the option selected by DOE was a reasonable place to start.

Additional Concerns About Site Characterization

Washington and the Yakima Indian Nation officials believe that DOE's site characterization process is a "success-oriented" approach designed so that resources are committed to shore up weak conclusions. These officials are concerned that under this approach, a decision on the acceptability of a site cannot be made until the costly site characterization process is completed.

The officials also commented that, based on the preliminary SCP draft chapters, DOE does not plan to include in the SCPs formal decision points for site disqualification, although DOE's siting guidelines specify that a site should be disqualified if certain technical conditions are not met. We believe one key decision point, for example, would be the decision to start construction of the shafts. DOE expects that the construction costs of the shafts will range from about 15 percent to 20 percent of the total cost of site characterization at the three sites.

DOE Process for Early Identification of Disqualifying Factors

Officials of DOE's Richland operations office told us that it is DOE's position that there is no simple set of experiments, such as the state of Washington has proposed, that are likely to resolve the issues regarding groundwater and natural resources. Hanford's project director informed us that specific decision points will be added to the program schedule as work progresses. Regarding the natural resources issue, DOE believes that geophysical surveying will provide information on structures having the potential of containing natural gases. For the groundwater issue, DOE anticipates that drilling and hydraulic testing of potential faults will provide definitive data. However, DOE also believes that technical reviews on how to resolve the groundwater issue have led to a better understanding of the issue because (1) potential faults have not been identified, (2) the testing program requires a complex of measurement facilities, and (3) testing at one location must be verified by testing at other nearby locations. DOE plans to implement such a program during site characterization.

Although DOE's Project Manager for the Yucca Mountain site agreed that the draft SCPs do not contain formal decision points for site disqualification, he said that the need to review new site data to determine if a site remains acceptable is inherent in the SCPs' structure and content. He explained that DOE's performance allocation process requires that issue resolution strategies be examined on a recurring basis to determine whether available data

indicate a need to change strategies, alter data gathering plans, and/or disqualify the site.

The Acting Director of the Project Management Division for the Deaf Smith site told us that the semiannual reports on the status of site characterization activities which are required by the NHPA and NRC regulations must include information on how identified issues have been resolved and on any new issues raised. Thus, he said, these reports require periodic assessment of the project and revised predictions of site performance based on specific data.

The Acting Director of Deaf Smith, Project Management Division also said that, since 1983, the project office has had a contract with an independent peer review organization consisting of 70 to 80 technical experts and specialists--from academia, industry, and government--in fields related to repository analysis. This organization reviews project office plans, strategies, and technical reports and will, in the future, focus its reviews on the project office's analytical approaches to show how issues were resolved and how regulatory requirements were satisfied. Although the other two project offices have used organizations to review certain aspects of their site work, neither has a similar standing contract with an organization covering all fields related to repository analysis.

Concerns About Whether Current
Site Characterization Milestones
are Achievable

State of Washington and the Yakima Indian Nation officials told us that they believe that the program milestones for the first repository are optimistic. (Table 1.1 details DOE's first repository schedule.) Washington officials said that the current schedule does not provide sufficient time for the required consultation and cooperation meetings between DOE and state and Indian tribes. Yakima Indian Nation officials said that the need for additional hydrology testing could delay the scheduled work.

As we recently reported, one of the major reasons for an increase in the estimated costs of site characterization is the lengthening of the time allowed to accomplish the characterizations.⁵ In a June 1987 amendment to its mission plan, DOE revised its milestone repository operational date from 1998 to 2003 thereby adding over 3 years to the previous 5-year site characterization phase. Adherence to current milestones for completing site characterization and license submission by 1995 is

⁵Nuclear Waste: Information on Cost Growth in Site Characterization Cost Estimates (GAO/RCED-87-200FS, September 10, 1987).

important to DOE's ability to perform its site characterization work at the latest cost estimate of \$5.8 billion.

Table 1.1: DOE's Schedule for the First Repository^{a,b}

<u>Activity</u>	<u>Target Date</u>
Start of exploratory shaft construction	
Yucca Mountain	Fourth quarter 1988
Hanford	Second quarter 1989
Deaf Smith	Fourth quarter 1989
Start of underground testing	
Yucca Mountain	Second quarter 1990
Hanford	Fourth quarter 1991
Deaf Smith	Fourth quarter 1991
Draft environmental impact statement	1993
Final environmental impact statement	1994
Submittal of the site-selection report to the President	1994
Submittal of the license application to the Nuclear Regulatory Commission	1995
Receipt of a construction authorization from the Nuclear Regulatory Commission	1998
Start of construction	1998
Start of phase 1 operations	2003

^aThe schedule is given in calendar years.

^bThis schedule is based on a budget requirement of \$725 million for fiscal year 1988.

Project office officials for the Yucca Mountain and Deaf Smith sites told us that current site characterization schedules are achievable. A project office official at the Hanford site, where exploratory shaft construction has been pushed back 6 months, said that delays could occur due to factors that are difficult to predict, including the

- amount of time it takes for the groundwater system to reestablish equilibrium after being disturbed by drilling the boreholes needed for the hydrologic testing program,

- speed at which basalt can be drilled for the exploratory shafts, and
- adequacy and timeliness of funding to accomplish the scheduled tasks.

Other Activities

The following discusses other DOE activities relating to the nuclear waste management program.

- On August 4, 1987, the Secretary of DOE submitted a certification report to the Chairmen of the Senate and House Appropriations Committees, as required by a conference report released on October 15, 1986. The conference report stipulated that release of \$79 million of DOE's fiscal year 1987 appropriations was subject to approval by the Subcommittee on Energy and Water Development, House and Senate Committees on Appropriations. The \$79 million was also subject to certification by the Secretary of Energy that DOE has made a "good faith effort" to comply with the requirements of consultation with states selected for site characterization. In its report to the Chairmen, DOE certified that it has made a "good faith effort" to comply with the requirements of Section 117(c) of the Nuclear Waste Policy Act, relative to consultation with the states selected for site characterization. DOE requested that the Committees approve the release of the \$79 million in appropriations that had been held back. The House Committee approved releasing the \$79 million; however, as of October 31, 1987, the Senate Committee had not taken action.
- On August 11, 1987, DOE selected Stone & Webster, a management and technical support contractor, to provide technical and field services for the salt repository project at the Deaf Smith County site in Texas. Under the contract, Stone & Webster will carry out site characterization and related support activities involving up to \$320 million over an initial 3-year contract period, with seven 1-year optional extensions.
- On August 21, 1987, DOE selected Roy F. Weston, Inc., a technical support firm, to provide headquarters with technical support services. The 5-year contract (2-year base period and three 1-year options) has an estimated value of approximately \$80 million.
- On August 20, 1987, DOE published in the Federal Register, a public notice entitled "Calculating Nuclear Waste Fund Disposal Fees for Department of Energy Defense Program

Waste." The notice sets forth the methodology that DOE intends to use in calculating the defense high-level waste disposal fees that DOE must pay into the Nuclear Waste Fund.

- On September 28, 1987, DOE selected Science Applications International Corporation, a management and technical support contractor, to design and implement a licensing support system. The contract has an estimated value of about \$5 million. The contractor will be required to support the repository authorization and licensing process by providing a means to store and retrieve documents that demonstrate how program decisions were made and carried out.
- During this quarter, DOE released its draft Land Acquisition Plan for acquisition of land in the Texas Panhandle where the Deaf Smith site is located. On September 23, 1987, the plan was sent to 180 landowners, state and local officials, and other interested parties. The plan calls for a public review period of 45 days, with a new schedule showing the actual commencement of negotiations for land acquisition in mid-February 1988.
- On October 1, 1987, the Secretary of Energy sent a letter to the governors of 17 states notifying them that site-specific activities on the second repository program would be resumed as of that date. This work is limited to preparing DOE's Area Recommendation Report that will identify potential second repository candidate sites. DOE plans to take from about 12 to 18 months to complete a review of and to consider the 60,000 comments received on an earlier draft report that identified potential sites. DOE does not intend to conduct any other site-specific activities until it finalizes the Area Recommendation Report.
- On October 5, 1987, DOE asked for bids on a systems engineering, development, and management contract. The contractor will be responsible for developing, under NWPA, the design and analysis of the nuclear waste management system. The proposed contract will cover 10 years at an estimated cost between \$100 and \$150 million a year. Bids are due January 15, 1988, and DOE expects to select a contractor in May 1988.

SECTION 2

LEGISLATIVE PROPOSALS RELATING TO THE NUCLEAR WASTE PROGRAM

As we reported last quarter, several bills proposing major changes to NWPA and the nuclear waste management program have been introduced in the Congress. The bills' proposals range from making adjustments to the present program to suspending all program activities while the program is reviewed. Although DOE believes that some adjustments can be made to improve the program, it is opposed to proposals that would suspend all program activities. During the quarter the Director of the Office of Civilian Radioactive Waste Management (OCRWM) presented DOE's position on several of these legislative initiatives.

RECENT LEGISLATIVE INITIATIVES

The following sections summarize key elements of two bills introduced that propose different approaches to redirecting the program.

- S. 1668 was introduced on September 1, 1987. Among other things, the bill would (1) require the Secretary, by January 1, 1989, to select from the first candidates sites a preferred site, and limit future characterization to the preferred site, (2) annul the MRS site previously selected by the Secretary, and require DOE by January 1, 1989, to survey and evaluate three sites in at least two states to select a preferred MRS site by October 1, 1989, (3) prohibit DOE from conducting site-specific activities on a second repository unless the Congress so authorizes, and (4) provide for payments from the Waste Fund to any state hosting a repository or any state or Indian tribe that hosts an MRS.

- H.R. 2967 was introduced on July 15, 1987. This bill is very similar to H.R. 2888 which we summarized in our last quarterly report. Under this bill, DOE's site-selection program would be suspended and a review commission would be established to evaluate DOE's program and report its findings and recommendations to the Congress. The commission would have 1 year from date of enactment to submit its report, and DOE would be prohibited from proceeding with its site-selection activity pending submission of the report and for 6 months after the date of the commission's report. The bill would also establish an Office of Nuclear Waste Negotiator and authorize the negotiator to find a state or Indian tribe willing to host a repository at a technically qualified site.

DOE'S COMMENTS ON PROPOSED BILLS

In his most recent testimony, given on October 16, 1987, before the Subcommittee on Energy and Power of the House Committee on Energy and Commerce, the Director, OCRWM, testified that there are elements of pending legislation that could provide constructive adjustments to the program and enable DOE to move ahead with the program in a sound technical way without sacrificing the progress that has been made. He said, however, that details, design, and implementation of these elements would require careful attention. The Director cited support for many of the elements in S. 1668, including (1) sequential characterization of sites for a repository, (2) authorization for an MRS as an integral part of the program, (3) suspension of site-specific work on a second repository, and (4) incentive payments to potential hosts.

The Director expressed opposition to the suspension of all program activities as called for by H.R. 2967 and H.R. 2888 in testimony given before the Senate Committee on Energy and Natural Resources on July 16, 1987, and before the Subcommittee on Energy and the Environment, House Committee on Interior and Insular Affairs, on September 18, 1987.

DOE believes that NWPA provides adequate and sufficient direction and authority to solve the problem of disposal of nuclear waste and that the need to proceed with the program is as urgent now as it was when NWPA was enacted. The Director, in his October 16, 1987, testimony said that (1) spent nuclear fuel and high-level waste continues to accumulate and the need for disposal continues to grow, (2) DOE's confidence in the basic principles of NWPA continues, and (3) technical progress made in the program has been very encouraging in spite of the institutional difficulties experienced.

SECTION 3

STATUS OF THE NUCLEAR WASTE FUND,

SEPTEMBER 30, 1987

The Nuclear Waste Fund, a separate fund maintained by the Department of the Treasury, finances the nuclear waste management program activities. The fund receives fees paid by the owners and generators of high-level radioactive waste. (Previous quarterly reports listed in app. I explain how the fund receives fees and makes disbursements.) As of September 30, 1987, the fund had a balance of about \$1.5 billion. (See table 3.1.)

Table 3.1: The Nuclear Waste Fund, September 30, 1987

Beginning fund balance (July 1, 1987)	\$1,496,260,379
Fees from waste owners (July-Sept. 1987)	107,973,276
Investment income collected (July-Sept. 1987)	<u>32,367,430</u>
Total funds available	<u>1,636,601,085</u>
Disbursements	(119,828,922) ^a
Change in cost and face value of long-term investments	<u>(9,984,273)^b</u>
Fund balance, September 1987	<u>\$1,506,787,890</u>
Cash balance, September 30, 1987	\$ 295,890
Funds invested, September 30, 1987	\$1,506,492,000
Unpaid obligations, September 30, 1987	\$ 213,912,806 ^c

^aThese figures include amounts disbursed in July-September that were obligated in current and prior years.

^bActions such as early redemptions of Treasury notes cause the face value to be reduced at that point. It does not, however, denote a loss to the fund.

^cThis figure includes amounts of undisbursed obligations remaining from current and prior years.

Note: All fiscal year 1987 dollar figures for section 3 are based on preliminary figures from DOE's financial information system. Final figures will not be available until after this report is issued.

NUCLEAR WASTE FUND
RECEIPTS AND COSTS

DOE has contracted with 66 owners and generators of spent fuel for a 1-mill-per-kilowatt-hour fee to be paid quarterly into the fund to finance the waste program. No new contracts were signed this quarter. The fund began receiving quarterly fees late in fiscal year 1983 and, as of September 30, 1987, had collected a total of about \$1.6 billion, of which about \$106 million was collected this quarter.

Owners of spent fuel generated before April 7, 1983, must pay a one-time fee into the Nuclear Waste Fund for the disposal of their spent fuel. This fee must be paid before delivery of spent fuel to the federal government. About \$1.5 million was collected during this quarter.

NWPA provides that when the amount of the Nuclear Waste Fund exceeds current needs, DOE may request the Secretary of the Treasury to invest these excess funds in Treasury financial instruments in amounts as the Secretary of Energy determines appropriate. In the quarter ending September 30, 1987, DOE collected daily overnight investments interest of about \$235,893 and long-term investments interest (90 days or more) of about \$32 million.

OCRWM can obligate amounts from the Nuclear Waste Fund only as appropriated, regardless of the balance in the fund. (See table 3.2.) OCRWM's appropriations for fiscal year 1986 totaled \$499 million. Appropriations for fiscal year 1987 were \$499 million. The conference report, accompanying the appropriations, stipulated that expenditure of \$79 million of the \$499 million was subject to prior approval by the Subcommittees on Energy and Water Development, House and Senate Committees on Appropriations. The \$79 million appropriation was dependent on the certification by the Secretary of Energy that DOE has made a good faith effort to comply with the requirements of consultation with states selected for site characterization. Although the Secretary submitted the required certification report on August 4, 1987, the Senate Committee had taken no action to approve the release of the \$79 million as of September 30, 1987.

Table 3.2: Nuclear Waste Program Appropriations

Carryover from prior years, as of September 1986	\$ 21,757,917
Fiscal year 1987 appropriation	<u>499,000,000</u>
Total for fiscal year 1987	<u>\$520,759,917</u>
Total amount obligated as of September 30, 1987	<u>\$414,002,753</u>
Appropriations carried to fiscal year 1988	<u>\$106,755,164</u>

Note: All fiscal year 1987 dollar figures for section 3 are based on preliminary figures from DOE's financial information system. Final figures will not be available until after this report is issued.

OCRWM obligates funds by awarding contracts and grants and disburses funds for its civil service payroll and other program needs. Actual costs are recorded when invoices are received, and disbursements are recorded when payments are made. Obligations, costs, and disbursements are recorded in DOE's financial information system by the field finance offices that receive allocations from the fund. During the quarter, expenses totaled about \$156 million for the five major cost activities. (See table 3.3.)

Table 3.3: Nuclear Waste Fund Costs, September 30, 1987^a

<u>Funding category</u>	<u>First quarter FY87 costs</u>	<u>Second quarter FY87 costs</u>	<u>Third quarter FY87 costs</u>	<u>Fourth quarter FY87 costs</u>	<u>Cumulative FY87 costs</u>
<u>First repository:</u>					
Development, construction, operations	\$60,735,740	\$83,891,158	\$ 93,542,622	\$116,540,433	\$354,705,464
Capital equipment	871,284	1,598,150	1,435,767	2,843,604	6,748,732
Plant acquisition and construction	-	-	-	-	-
Total	<u>61,607,024</u>	<u>85,489,308</u>	<u>94,978,389</u>	<u>119,384,037</u>	<u>361,454,196</u>
<u>Second repository:</u>					
Development, construction, operations	4,909,201	2,313,080	5,024,317	14,376,054	26,570,651
Capital equipment	17,000	64,000	28,000	853,000	962,000
Plant acquisition and construction	-	-	-	-	-
Total	<u>4,926,201</u>	<u>2,377,080</u>	<u>5,052,317</u>	<u>15,229,054</u>	<u>27,532,651</u>
<u>Monitored retrievable storage:</u>					
Development, construction, operations	97,866	254,122	455,262	576,587	1,384,337
Capital equipment	-	-	-	-	-
Plant acquisition and construction	-	-	-	-	-
Total	<u>97,866</u>	<u>254,622</u>	<u>455,262</u>	<u>576,587</u>	<u>1,384,337</u>
<u>Program management and technical support:</u>					
Management and support	9,644,060	13,477,518	12,003,716	10,812,382	45,937,676
Capital equipment	110,026	48,167	43,290	267,374	468,857
Plant acquisition and construction	-	-	-	-	-
Total	<u>9,754,086</u>	<u>13,525,685</u>	<u>12,047,006</u>	<u>11,079,756</u>	<u>46,406,533</u>
<u>Transportation and system integration:</u>					
Design, development, and testing	5,325,946	6,830,426	7,028,490	9,760,366	28,826,228
Capital equipment	186,268	5,838	236,689	-	428,795
Total	<u>5,512,214</u>	<u>6,836,264</u>	<u>7,265,179</u>	<u>9,760,366</u>	<u>29,255,023</u>
Total	<u>\$81,897,393</u>	<u>\$108,482,959</u>	<u>\$119,798,152</u>	<u>\$156,029,800</u>	<u>\$466,032,739</u>

^aTotals may not add due to rounding.

Source: DOE's financial information system.

Most waste disposal activities have been and are being carried out by contractors. Of the \$156 million spent this quarter for program cost activities, DOE spent about \$134.5 million for contractor services. About \$54 million obligated was for contractors. Since inception of the fund, OCRWM has obligated about \$1.5 billion for over 140 contracts.

SECTION 4

LITIGATION RELATING TO
THE NUCLEAR WASTE PROGRAM

During the quarter ending September 30, 1987, two pending court cases were resolved (see previous quarterly reports for more detailed information on the individual cases) and four new actions were filed.

SETTLED CASES

Natural Resources Defense Council,
Inc., et al. v. the Environmental
Protection Agency and the United
States of America

The states of Maine, Minnesota, Texas, and Vermont and various environmental groups, including the Natural Resources Defense Council, Inc., and the Environmental Policy Institute, have filed suits challenging the Environmental Protection Agency's (EPA) High-Level Waste Standards, which were published in September 1985. The suits were consolidated and, in March 1986 briefs were filed in the U.S. Court of Appeals for the First Circuit in Boston. These states and environmental groups allege that EPA standards are arbitrary and capricious and that the groundwater and individual protection provisions of the standards violate provisions of the Safe Drinking Water Act. According to an attorney from the Department of Justice, oral arguments were heard during the quarter ending December 1986.

On July 17, 1987, the Court of Appeals invalidated the standards on the ground that EPA had not adequately explained the basis for adopting standards less stringent than those required under the Safe Drinking Water Act. In addition, the court found that EPA had not adequately explained the basis for its decision to limit to 1,000 years certain requirements imposed on DOE to provide for the protection of individuals and that EPA had failed to provide adequate notice and opportunity for comment before adopting some of the standards.

The First Circuit Court of Appeals has denied a government motion for rehearing of the court's July 17 decision. However, the court did allow parts of the high-level waste standards to remain in effect while EPA is working to meet court objections to other parts of the standards.

Nevada, et al. v. Herrington

On May 28, 1986, the state of Nevada petitioned the U.S. Court of Appeals for the Ninth Circuit for review of the Secretary's denial of the state's grant request. Nevada asked for funds which would enable the state to seek judicial review of the Secretary's and President's selection of candidate sites. The petition asked the court to prohibit site characterization until DOE awards the state its grant request. The state of Washington, its Department of Ecology, and its Nuclear Waste Board also petitioned the Circuit Court on July 31, 1986. This case was consolidated with the Nevada petition.

Oral arguments were heard by the U.S. Court of Appeals on February 12, 1987. On September 17, 1987, the Ninth Circuit Court of Appeals held in favor of DOE. In denying the petition, the court said "that judicial review is not an activity which Congress intended the Nuclear Waste Fund to finance."

PENDING LITIGATION

On March 4, 1987, the U.S. Court of Appeals granted the state of Washington's motion for expedited briefing of the motion by the state of Washington for a judgment declaring that the Secretary of Energy has no authority to postpone second repository siting activities. Petitioners' (states and others) briefs were due by May 22, 1987. Briefs were filed by the state of Washington, the Environmental Defense Fund, and People Against Nuclear Dumping. Joint briefs were also filed by the states of Oregon, Idaho, and Nebraska; the state of Texas and the Nuclear Waste Task Force; and the Yakima Indian Nation and Clark County Public Utility District.

DOE's response was filed June 29, 1987, and the petitioners filed a single joint reply brief on July 16, 1987. DOE argued in part that the petitioners could not "establish a concrete and immediate injury or threat of such injury, that is fairly traceable to the conduct of the Secretary" and therefore "cannot establish standing to challenge the decision to postpone site-specific activities in the second repository program." DOE also argued that the petitioners "base their claim of injury on the wholly unwarranted assumption that the effect of the Secretary's decision is that the second repository has been cancelled and there will be only one repository."

On September 30, 1987, DOE filed a motion to dismiss for mootness before the Ninth Circuit Court of Appeals. The Secretary reaffirmed his previous commitment to resume site-specific activities by October 1, 1987, unless the Congress took legislative action to modify that schedule. The date has passed and the Congress has made no modification to the second repository program schedule. OCRWM has resumed site-specific activities of the second repository program, and DOE believes there are no continuing,

present, or adverse effects that would justify the continuation of this litigation. Oral arguments were heard October 9, 1987.

On March 4, 1987, the U.S. Court of Appeals denied motions filed by petitioners for discovery, without prejudice for refileing, which would have allowed them to serve DOE with requests to produce program documents relating to DOE's guidelines and first and second repository decisions. However, DOE has made a voluntary effort to make some of its information files accessible. According to DOE's Office of General Counsel, approximately 20 attorneys representing the petitioners will be examining DOE's records.

DOE and Justice met with the petitioners' attorneys on September 22, 1987, in San Francisco, California, in order to work out a schedule of document access. They were able to prepare a schedule for the guidelines cases, however, with respect to the siting/environmental assessment cases they were able only to agree upon a protective order to shield proprietary information that may be in the nonadministrative record.

The parties' agreed decisions provided that in the guideline cases, DOE would provide the balance of nonadministrative record on microfilm and an index to the petitioners by October 6, 1987. The petitioners had until October 13, 1987, to furnish DOE with their lists of questions on guidelines access; DOE agreed to answer those questions by November 13, 1987. The petitioners have until January 13, 1988, to review guidelines documents and file informal requests for discovery.

NEW LITIGATION THIS QUARTER

According to DOE's Office of General Counsel, there were four new actions filed during this quarter. They are as follows:

State of Nevada v. Herrington

The state of Nevada filed a motion with the Ninth Circuit on July 13, 1987. This motion asks the court to enjoin the Secretary of Energy from proceeding with any site-specific activity at the Yucca Mountain site until EPA has complied with the mandate of the First Circuit in NRDC v. EPA (see p. 26).

On August 23, 1987, DOE filed its response to Nevada's motion. DOE contended that Nevada's motion must be denied because it rests on a fundamental misconception of the role that EPA high-level waste standards will play in implementing the NHPA. Moreover, DOE believes Nevada's request for injunction relief should be denied because it has not demonstrated how it would be irreparably injured if this relief were not granted. In conclusion, according to DOE, EPA's standards were not found illegal in NRDC v. EPA, but were remanded to EPA for better justification and additional public comment. DOE argues that it is not clear whether the standards

will change, and if they do not, the stay would have achieved nothing but a delay.

State of Washington v. Herrington

The state of Washington filed a request for injunction with the Ninth Circuit on September 29, 1987. This motion asks the court to enjoin DOE from further site-specific activity at Hanford until EPA satisfies the First Circuit Court of Appeals that its regulations concerning high-level radioactive waste repositories are valid. DOE's response was filed on October 16, 1987.

National Association of Regulatory
Utility Commissioners v. Department
of Energy

On September 9, 1987, the National Association of Regulatory Utility Commissioners (NARUC) petitioned the U.S. Court of Appeals for the District of Columbia for its review of DOE's order of August 14, 1987, denying NARUC's Petition for Rulemaking entitled "In the Matter of 10 C.F.R. Part 961--Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste." In mid-October DOE filed a motion for extension.

State of Nevada, et al. v. Herrington

On September 30, 1987, the state of Nevada petitioned the Ninth Circuit Court of Appeals for a rehearing by the full court of that court's September 17 decision (see Settled Cases). The states of Mississippi, Utah, and Wisconsin are intervenors in this petition. The petitioners believe that inconsistencies exist with an earlier ruling by the same court on eligibility for grant funds, justifying a rehearing by the full court.

GAO REPORTS ON THE NUCLEAR WASTE PROGRAMANNUAL REPORTS TO THE CONGRESS

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Nuclear Waste: Status of DOE's Implementation of the Nuclear Waste Policy Act (GAO/RCED-87-17, Apr. 15, 1987).

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Status of the Department of Energy's Implementation of the Nuclear Waste Policy Act of 1982 as of September 30, 1984 (GAO/RCED-85-42, Oct. 19, 1984).

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Nuclear Waste: Impact of Savannah River Plant's Radioactive Waste Management Practices (GAO/RCED-86-143, July 29, 1986).

Nuclear Waste: Issues Concerning DOE's Postponement of Second Repository Siting Activities (GAO/RCED-86-200FS, July 30, 1986).

Nuclear Waste: Cost of DOE's Proposed Monitored Retrievable Storage Facility (GAO/RCED-86-198FS, Aug. 15, 1986).

Nuclear Waste: Institutional Relations Under the Nuclear Waste Policy Act of 1982 (GAO/RCED-87-14, Feb. 9, 1987).

Nuclear Waste: Status of DOE's Nuclear Waste Site Characterization Activities (GAO/RCED-87-103FS, Mar. 20, 1987).

Nuclear Waste: DOE Should Provide More Information on Monitored Retrievable Storage (GAO/RCED-87-92, June 1, 1987).

Nuclear Waste: A Look At Current Use of Funds and Cost Estimates for the Future (GAO/RCED-87-121, Aug. 31, 1987).

Nuclear Waste: Information on Cost Growth in Site Characterization Cost Estimates (GAO/RCED-87-200FS, Sept. 10, 1987).

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Department of Energy's Program for Financial Assistance (GAO/RCED-86-4, Apr. 1, 1986).

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Nuclear Waste: DOE Should Provide More Information on Monitored Retrievable Storage (GAO/T-RCED-87-30, June 11, 1987).

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MAJOR CONTRIBUTORS TO THIS FACT SHEETRESOURCES, COMMUNITY, AND ECONOMIC DEVELOPMENT DIVISION,
WASHINGTON, D.C.

Keith O. Fultz, Associate Director (202) 275-1441
Dwayne E. Weigel, Group Director
John W. Allen, Assignment Manager
Sherry Gilmore Taylor, Evaluator-in-Charge
Richard A. Renzi, Advisor
Thomas Armstrong, Senior Attorney - Office of General Counsel
Shirley Perry, Writer-Editor
Theresa P. Himbrick, Typist

SEATTLE REGIONAL OFFICE

Leonard L. Dowd
William E. Hanson
Robert B. Miller

(301792)



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