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Report to Congressional Committees

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NUCLEAR WASTE

Much Effort Needed to Meet Federal Facility Compliance Act's Requirements

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Resources, Community, and
Economic Development Division

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May 17, 1994

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Chairman
The Honorable John H. Chafee
Ranking Minority Member
Committee on Environment
and Public Works
United States Senate

The Honorable John D. Dingell
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House of Representatives

The Federal Facility Compliance Act (FFCA), enacted on October 6, 1992, substantially changed how the Department of Energy (DOE) manages wastes containing radioactive and hazardous material—known as mixed wastes—that are generated or stored at DOE facilities. FFCA requires that, by October 1995, DOE submit plans to develop and operate technologies and facilities for treating its mixed wastes to host states that are authorized to regulate hazardous material or to the Environmental Protection Agency (EPA), obtain the states' or EPA's approval of the treatment plans, and enter into legal orders that require the Department to comply with the approved plans. Otherwise, after October 1995, DOE is subject to fines of up to $25,000 per day under the Resource Conservation and Recovery Act (RCRA) for each violation of RCRA's restrictions against storing untreated mixed wastes.

FFCA also requires that we report on, among other things, (1) DOE's progress with submitting treatment plans and entering into compliance orders; (2) DOE's efforts to characterize,[1] develop technologies for, and provide the capacity to treat mixed wastes; and (3) the additional actions needed to completely implement the act.[2] Because DOE has over 1,500

[1]Characterizing wastes can involve several techniques to better understand the radioactive and hazardous chemicals that are present and how to treat them. These techniques generally involve analyzing historical records and laboratory samples to identify the material used and the by-products generated by an activity or industrial process.

[2]As agreed with the committees, we did not address two additional requirements of FFCA. See appendix V of the report for further information on these requirements.

mixed waste streams[3] at 50 sites, the Senate Committee on Environment and Public Works and House Committee on Energy and Commerce agreed that in order to evaluate DOE's efforts to manage and treat mixed wastes, we should evaluate DOE's progress on a judgmentally selected group of individual mixed waste streams at several key sites—specifically the Fernald, Ohio; Idaho Falls, Idaho; and Oak Ridge, Tennessee, sites.

Results in Brief

As of April 1994, DOE had submitted to the states and EPA preliminary site treatment plans that identify thousands of treatment options for the Department's mixed wastes and had started to evaluate the technical feasibility and cost of these options. DOE had not submitted a proposed site treatment plan that identifies specific treatment technologies and schedules to any state or EPA for its review and approval and does not expect to do so until February 1995. DOE has devoted relatively less attention to developing proposed language for compliance orders under FFCA than it has devoted to developing site treatment plans.

DOE has made limited progress in developing the capacity to treat mixed waste streams at its Fernald, Idaho Falls, and Oak Ridge sites. Since October 1991, DOE has developed new capacity to treat only 1 of the sites' 34 largest waste streams. DOE's progress with the waste streams has been limited by (1) insufficient information concerning the wastes' radioactive and hazardous characteristics and alternative treatment technologies for the wastes and (2) DOE's general preference to defer construction of new treatment facilities until after the Department, the states, and EPA negotiate site treatment plans required by FFCA.

DOE, the states, and EPA must complete several tasks and resolve numerous technical and policy issues if they are to meet the act's October 1995 target date. Because DOE is months away from developing the site treatment plans that will address these issues, it is too early to tell if DOE, the states, and EPA will be able to resolve the issues, negotiate final site treatment plans, and enter into compliance orders by October 1995. However, considering the amount of work that remains and the time available to complete this work, if DOE misses its internal milestones for preparing the site treatment plans, the likelihood of missing FFCA's October 1995 deadline increases.

[3]A waste stream is a collection of waste materials that have similar physical or chemical characteristics. It can be an administrative designation of similar wastes that are generated by several of DOE's activities or the waste that is generated by one activity.

Background

Mixed wastes can take a variety of forms and are found at facilities throughout the DOE complex. For example, mixed wastes include radioactive sludge containing toxic metals that DOE extracted from waste-holding ponds, a solution of uranium and hazardous chemicals left in equipment when DOE shut down the equipment, and radioactively contaminated lead shielding used during tests of nuclear fuels. In an April 1993 interim report on its mixed waste inventory, DOE estimated that 50 sites in 22 states store about 600,000 cubic meters of such wastes. Over the next 5 years, DOE's operations, waste management, and cleanup activities in the 22 states could generate an additional 920,000 cubic meters of mixed wastes.

The Congress enacted FFCA to (1) resolve any questions about DOE's immunity to the imposition of fines for violating federal, state, and local solid and hazardous waste requirements and (2) accelerate DOE's efforts to comply with RCRA's requirements for the hazardous components of mixed wastes. FFCA provides DOE with a 3-year grace period to negotiate the final treatment plans and enter into compliance orders with the states and EPA, during which time DOE will be immune from fines for accumulating untreated mixed wastes. After October 1995, DOE will be immune from RCRA's fines for storing untreated mixed wastes only if the Department adheres to the approved final site treatment plans and compliance orders. Appendix I elaborates on RCRA's requirements for mixed wastes and DOE's historical efforts to meet these requirements. Appendix II summarizes FFCA's key milestones for developing mixed waste treatment plans and compliance orders by October 1995.

Within DOE, the Office of Environmental Management has organized a task force to implement FFCA and has signed a cooperative agreement with the National Governors' Association (NGA) to facilitate discussions on FFCA between DOE and the 22 states that host a DOE facility with mixed wastes. Appendix III identifies the 16 states that have been authorized by EPA to directly approve the site treatment plans and issue compliance orders under FFCA and the 6 states where EPA retains this authority.

DOE Intends to Submit Proposed Site Treatment Plans During Early 1995

After consulting with the states and EPA, DOE adopted a multiple-stage process to gradually build consensus among the states and EPA on national options for treating DOE's mixed waste inventory. In keeping with this process, DOE has not submitted a proposed site treatment plan to any state or EPA for its review and approval and does not expect to do so until February 1995.

DOE's Process for Complying With FFCA Emphasizes Several Iterations of Treatment Plans

During each of the 3 years between FFCA's October 1992 enactment and its October 1995 deadline, DOE has developed and will develop increasingly detailed site treatment plans. Specifically, according to DOE's schedule for complying with the act, the process involves the following stages:

- In October 1993, DOE submitted to the states and EPA preliminary site treatment plans, which DOE called conceptual site treatment plans. These plans were intended to provide a starting point for discussions between DOE, the states, and EPA on how to treat DOE's mixed wastes by identifying all technological options.
- By August 1994, DOE sites will issue draft site treatment plans that will narrow down the options presented in the conceptual site treatment plans to one or more preferred treatment options for each waste stream. The draft site treatment plans will also identify the facilities that DOE could build to treat these streams and the tentative location, size, and cost of these treatment facilities.
- By February 1995, DOE sites will submit proposed site treatment plans to states and EPA for their review and approval. The plans are to include schedules for developing technologies and for operating any combination of local, regional, or national mixed waste treatment facilities.
- From February 1995 through October 1995, the states and EPA will receive public comments on DOE's proposed site treatment plans and incorporate these comments into the proposed plans. By October 1995, DOE, the states, and EPA will negotiate any final changes to the proposed site treatment plans, approve final site treatment plans, and enter into compliance orders.

DOE's plan for implementing FFCA's requirements states that, between each of these stages, DOE headquarters and sites will meet regularly with the states and EPA to obtain their perspective on technological options, treatment issues, and compliance orders. DOE's process for implementing FFCA's requirements also includes the development of a national inventory of DOE's mixed waste streams and technologies and summaries of the sites' conceptual, draft, and proposed plans that DOE, the states, and EPA can use to analyze mixed waste transportation and treatment issues.

DOE Has Met Several of FFCA's Early Milestones

DOE has met several milestones for the first 18 months of FFCA's implementation and has begun developing draft site treatment plans. In April 1993, DOE published an interim inventory report that identified the radiological and hazardous characteristics of its 1,500 mixed waste streams, the facilities that DOE sites planned to build to treat these wastes,

and the 267 technology development projects that DOE had funded to improve mixed waste technologies. Using this inventory information, DOE sites published, in October 1993, 48 conceptual site treatment plans that identified all possible on- and off-site options for treating the sites' mixed wastes.[4] In total, the 48 conceptual plans identified 30,000 options for treating DOE's 1,500 mixed waste streams.

Since publishing the conceptual site treatment plans and in accordance with its implementation plan for FFCA, DOE has met with state representatives to hear their reactions to DOE's mixed waste activities and to develop a framework for developing the August 1994 draft site treatment plans. As a result of these meetings and internal reviews of the proposed framework, DOE decided that sites will use a two-step process for developing the draft plans. Sites will start the process by (1) identifying the mixed waste streams that are sufficiently characterized to allow for the selection of preferred treatment technologies and (2) discussing the preferred treatment options with regulatory agencies. Once agreements are reached with the regulatory agencies for these well-characterized streams, DOE sites will identify and discuss treatment options for streams that are not sufficiently characterized or for which there are no proven treatment technologies. As of April 1994, DOE sites had submitted a list of well-characterized streams and their preferred treatment options to headquarters and were discussing the options with state and EPA officials.

DOE has devoted less attention to developing proposed language for the compliance orders under FFCA, partly because the Department's FFCA task force staff believe that DOE, the states, and EPA cannot write compliance orders until after DOE develops the proposed site treatment plans. DOE's FFCA task force staff believe that, during the first year after the Congress passed FFCA, it was more important to prepare FFCA's mandated schedule for submitting proposed site treatment plans and the mixed waste inventory report and to start developing the technical details of the site treatment plans than it was to start developing the legal framework for implementing the plans. In December 1993, DOE established an FFCA working group to begin evaluating alternative legal language to propose to the states and EPA for compliance orders. As of April 1994, DOE headquarters, the Idaho Field Office, and the West Valley, New York,

[4]According to DOE, 2 of the 50 sites that store or generate mixed wastes do not have to prepare site treatment plans and compliance orders. Under section 3021(b)(5) of FFCA, the state of Washington has waived the requirement for DOE's Hanford, Washington, site to prepare a site treatment plan because DOE's Tri-Party Agreement with the state and EPA already includes schedules for mixed waste treatment. DOE is not preparing a site treatment plan for its Waste Isolation Pilot Plant in New Mexico because DOE expects to receive a "no migration variance" from EPA to operate the facility, which would allow DOE to store mixed waste without violating RCRA's storage prohibition.

Project Office had agreed to discuss alternative language for the pilot compliance orders under FFCA with Idaho and New York state officials, respectively, and FFCA staff had met twice to discuss lessons learned from DOE's past experience with interagency compliance orders. Also, NGA has organized an FFCA subgroup of representatives from the National Association of Attorneys General and states' attorney general offices to examine DOE-related mixed waste issues. NGA also held one telephone conference call to discuss the subgroup's potential objectives and contributions to the development of final site treatment plans and compliance orders.

Meeting Other FFCA Milestones Has Been More Difficult Than DOE Expected

Although DOE has met some of its internal FFCA milestones, it has missed others. According to the director of DOE's FFCA task force, DOE has missed some FFCA milestones because DOE underestimated the amount of time needed to develop national data on mixed waste inventories and treatment options.

Specifically, DOE took 3-1/2 months longer than expected to develop a national summary of the 48 conceptual site treatment plans. In a September 1993 schedule of activities to implement FFCA, DOE projected that it would submit the summary to EPA and the states by the end of November 1993, 1 month after releasing the conceptual site treatment plans. However, DOE did not publish the 1,300-page national summary until March 11, 1994. According to the FFCA task force director, DOE underestimated the time needed to receive consistent data from 48 diverse field sites, verify the accuracy of the data, and write the summary report. Also, when DOE estimated that it would take 1 month to publish the report, it had not firmly defined the report's objectives and outline.

DOE has also taken 4 months longer than expected to respond to the states' and EPA's requests to expand the April 1993 interim mixed waste inventory. Commenting on the interim inventory, the states and EPA generally questioned the validity of the historical information that DOE had used to characterize waste streams and the Department's determination that existing technology could adequately treat specific streams. Responding to these comments, DOE requested, in September 1993, that its field staff provide additional information to headquarters within 1-1/2 months so that DOE could provide the expanded information to the states by mid-December 1993. As of April 1994, DOE headquarters still had not received and verified the expanded inventory information from all sites. DOE has published partial data for 25 sites rather than delay releasing the

information until all sites had responded. Again, the FFCA task force director attributed the delays to DOE's difficulty in getting 48 sites to provide consistent information in a short time frame.

DOE's Deputy Assistant Secretary for Waste Management and DOE's FFCA task force director believe that despite the delays in preparing the summary and expanded inventory information, the Department will be able to meet its internal August 1994 and February 1995 milestones for the draft and proposed site treatment plans, respectively. However, DOE officials acknowledge that meeting the milestones for the draft and proposed site treatment plans will be difficult because DOE has many tasks to complete.

DOE Field Sites Are Treating a Limited Number of Mixed Waste Streams

After decades of activities involving nuclear weapons and nuclear research activities, DOE's Fernald, Idaho Falls, and Oak Ridge sites store thousands of cubic meters of mixed wastes in drums and tanks, and in other structures. Unless DOE properly stores, treats, and disposes of the wastes, the radioactive and hazardous material in them can potentially contaminate soil and groundwater and threaten public health and safety.

Three DOE Sites Have Completed Preliminary Assessments of Their Waste Streams

For the 34 large waste streams at Fernald, Idaho Falls, and Oak Ridge that we reviewed, from October 1991 through April 1994, DOE improved its overall understanding of the streams' characteristics and treatment options. DOE is also treating 3 of the 34 streams. Appendix IV elaborates on the status of the 34 streams.

However, the DOE sites did not significantly increase their capacity for treating the streams. Since October 1991, DOE has developed new capacity to treat only 1 of the 34 waste streams. DOE's Fernald site has converted existing equipment to treat uranium nitrate waste that remained in the equipment after DOE stopped production at Fernald. DOE is treating two streams—liquid wastes and oils containing radioactive material—at an Oak Ridge facility that mixes liquid waste with concrete and at the site's Toxic Substances and Control Act (TSCA) incinerator. DOE built these two treatment facilities during the late 1980s.

Reasons Why DOE Is Not Treating More Mixed Waste Streams Vary

DOE has not developed new treatment capacity for and is not treating more of the waste streams at the three sites for several reasons. The primary reason is that, because DOE assigned a low priority to treating mixed

wastes before FFCA was passed, DOE did not have sufficient information in 1991 to begin building, testing, or operating new treatment facilities. For example, DOE's Oak Ridge site had characterized the liquid waste and radioactive oil streams sufficiently to begin treating these two streams; however, the DOE sites had not developed sufficient characterization information for 32 streams to decide which alternative treatment technologies the Department should develop.[5]

Another reason why DOE has not made more progress since October 1991 in developing new mixed waste treatment capacity is that DOE considered the 2-1/2 years since October 1991 as a planning period to reexamine the Department's mixed waste construction plans while it developed site treatment plans with the states and EPA. DOE has continued designing and constructing a limited number of mixed waste treatment facilities at sites with large inventories of mixed wastes, such as Hanford and Savannah River, on a case-by-case basis. However, the Deputy Assistant Secretary for Waste Management told us that unless a site's large inventory of mixed wastes makes it obvious that a treatment facility will be needed, she has been reluctant to begin designing and constructing new mixed waste facilities until after DOE, the states, and EPA negotiate final site treatment plans and enter into compliance orders.

DOE officials recognize that the Department has more detailed characterization information and a better understanding of technological alternatives for some mixed waste streams than it does for others and expect that the final site treatment plans and compliance orders will reflect these different levels of understanding. For example, DOE expects that its final site treatment plans will contain (1) well-defined schedules for building and operating facilities for streams that are well-characterized and have clear treatment alternatives, and (2) for other streams, less-detailed plans that will define how DOE intends to characterize the streams, evaluate alternative technologies, and select the final treatment technologies.

[5]From 1987 through 1991, DOE had characterized and treated a pond sludge waste stream at Oak Ridge that we reviewed. However, because DOE was not sure that the treated waste met RCRA's land disposal restrictions, DOE closed the treatment facility in 1991 and decided to further characterize the stream before selecting a treatment that would meet RCRA's disposal requirements.

Considerable Effort Remains to Complete Site Treatment Plans and Compliance Orders by October 1995

DOE, the states, and EPA must complete several tasks and resolve numerous technical and policy issues before the organizations can submit and approve final site treatment plans and enter into compliance orders. The states and EPA officials that we contacted are cautiously optimistic that these steps can be completed and that issues can be resolved by October 1995.

Actions Are Needed to Complete Plans and Orders

DOE, the states, and EPA have several critical steps they must complete to arrive at final plans and enter into compliance orders under FFCA by October 1995. Between April 1994 and October 1995, DOE, the states, and EPA must (1) develop and review draft site treatment plans that will identify a more limited number of treatment options for waste streams than the conceptual site treatment plans identified; (2) agree on the size and location of proposed treatment facilities and on steps to develop treatment technologies so that DOE can present milestones for these activities in the proposed site treatment plans; (3) negotiate mutually acceptable changes to DOE's proposed site treatment plans that may result from the states', EPA's, and the public's review of proposed site treatment plans; and (4) enter into compliance orders to implement the final site treatment plans.

DOE's Assistant Secretary for Environmental Management and Deputy Assistant Secretary for Waste Management recognize that completing the site treatment plans and entering into compliance orders on time will be difficult. These officials informed us that they intend to become more involved in the FFCA process as DOE, the states, and EPA begin to negotiate site treatment plans and language for compliance orders. For example, as of April 1994, DOE's Deputy Assistant Secretary and the FFCA task force had briefed the Assistant Secretary about once every 4 months on the Department's FFCA strategy and progress. During a February 1994 briefing, the Deputy Assistant Secretary and Assistant Secretary agreed to meet monthly to discuss DOE's development of draft site treatment plans and issues that could affect the progress of proposed and final site treatment plans and compliance orders.

Numerous Issues Need to Be Resolved

Through their meetings with DOE, comments on DOE's mixed waste inventory report, and discussions with us, the states and EPA have identified five technical and policy issues that are central to the national

discussions of mixed wastes. Based on our discussions with 13 states that have authority to approve final site treatment plans and issue compliance orders and three EPA regional offices that will approve final site treatment plans and issue compliance orders for states that do not have the authority,[6] table 1 indicates the number of states and EPA regional offices that believe these issues are important.

Table 1: Issues That Are Central to National Discussions of Mixed Waste Plans and Compliance Orders

Issue	Number of states and EPA offices that considered issues important[a]
Treatment of mixed wastes generated in other states	14
Accuracy of DOE's characterization data	13
Mixed waste disposal facilities and schedules	12
Selection of mixed waste treatment technologies	10
Size of mixed waste treatment facilities	9

[a]Total number of states and EPA offices possible equals 16.

In various NGA meetings, states with DOE sites that have the largest inventories of mixed wastes, such as Idaho, Ohio, Tennessee, and Washington, have expressed a strong preference for using local facilities to treat wastes that are already stored on their sites and a preference not to treat waste generated in other states. For example, at a January 1994 NGA meeting, Tennessee's FFCA representative commented that the state is uncomfortable with an informal DOE proposal that Tennessee treat mixed wastes generated at nearby sites in Kentucky and Ohio. However, states with DOE sites that have relatively small volumes of mixed wastes, such as Pennsylvania and Texas, believe that building treatment facilities in their state may not be economical and prefer that DOE treat their wastes at sites in other states. States with large DOE inventories of mixed wastes are willing to consider that economies of scale may compel DOE to ship some wastes out-of-state but insist that, in each case, DOE's proposed site treatment plans must prove that this is the most economical and environmentally acceptable treatment alternative.

Several states, such as California, Colorado, Idaho, Ohio, and Tennessee, have also emphasized that accurate characterization of mixed wastes at DOE sites is essential if DOE is to select technologies and determine the size of facilities to effectively and economically treat the wastes. However,

[6]The 13 states were California, Colorado, Idaho, Illinois, Kentucky, Missouri, Nevada, New Mexico, New York, Ohio, South Carolina, Tennessee, and Texas. The three EPA regional offices will approve site treatment plans and issue compliance orders for Iowa, New Jersey, and Pennsylvania.

states disagree on how much characterization DOE sites need to complete before the states can approve site treatment plans and issue compliance orders required by FFCA. Idaho is generally confident in the quality of DOE's initial characterization data for streams at its site and contends that DOE's final site treatment plan for Idaho need only to include an acceptable plan for developing more detailed characterization information. Colorado, Ohio, and Tennessee officials believe that, for their states, DOE needs to develop additional waste characterization information to determine more precisely the volume of mixed wastes that needs to be treated and to select treatment technologies for their final site treatment plans.

Finally, states are concerned that, because FFCA does not require DOE to develop plans for disposing of mixed wastes, the proposed site treatment plans may not discuss facilities and schedules for disposing of the mixed wastes that will remain after treatment. At a March 1994 NGA meeting, several states commented that they would not approve DOE's proposed site treatment plans if the proposed plans do not include a plan to dispose of mixed wastes. For example, Nevada believes that the proposed site treatment plans should (1) identify the specific facilities that DOE will use to dispose of mixed wastes and (2) include schedules for building and operating disposal facilities. Other states, such as California, Idaho, South Carolina, and Tennessee, agree that the proposed site treatment plans should discuss DOE's disposal plans.

States and EPA Are Cautiously Optimistic About Meeting October 1995 Deadline

Considering the number and types of issues that the organizations have to resolve, many state and EPA officials that we contacted are cautiously optimistic that they will be able to approve FFCA plans and issue compliance orders by October 1995. States such as Idaho and Tennessee believe that they can individually work through the technical and policy issues with DOE and agree on plans and enter into compliance orders by October 1995 to treat their own mixed wastes. However, these and other states with large DOE inventories generally recognize that (1) they will have to consider options for treating other states' mixed wastes before approving final treatment plans and (2) their ability to reach agreements on treating other states' mixed wastes will depend on complicated discussions and trade-offs between the states. For example, a state may be willing to consider being the site of a regional mixed waste treatment facility and accepting out-of-state wastes if another state is willing to dispose of the mixed wastes that remain after treatment.

As of April 1994, the states and EPA had not started to discuss the types of trade-offs that will be needed before they approve final site treatment plans and enter into compliance orders. State and EPA officials believe discussions of potential trade-offs cannot begin in earnest until DOE submits the draft site treatment plans.

DOE's FFCA Task Force Is Partially Addressing States' and EPA's Concerns

DOE has several initiatives to resolve the states' and EPA's concerns. For example, as a result of the states' and EPA's preference for on-site treatment of locally generated wastes, DOE revised its framework for analyzing sites' treatment options and agreed to examine on-site treatment options before the sites consider off-site options. DOE's FFCA task force is also meeting with the states to identify potential locations for disposal facilities and has agreed to work with the states to develop a strategy for disposing of mixed wastes.

These initiatives have not resolved all issues involving FFCA that are important to the states and the EPA officials that we contacted. As of April 1994, DOE, the states, and EPA had not agreed on a consistent definition of how much characterization information is enough to negotiate site treatment plans and enter into compliance orders. DOE also has not reached agreement with the states and EPA on the type of waste disposal information that the states and EPA will accept in the final site treatment plans.

DOE's Assistant Secretary has asked that the Department's FFCA task force involve states' attorneys general more extensively in DOE's development of final site treatment plans and proposed compliance orders and begin negotiating compliance orders that could serve as pilots for final orders. By starting negotiations on orders with one or more states, DOE hopes to gain experience with negotiating compliance orders under FFCA and be able to better judge whether the Department can negotiate mutually agreeable orders with the states by October 1995. Although the states have the authority to issue unilateral compliance orders that require DOE to implement mixed waste treatment schedules, the Assistant Secretary wants to negotiate mutually agreeable language for the compliance orders whenever possible.

The Assistant Secretary also told us that he tentatively supports the concept of issuing separate proposed and final site treatment plans for streams that are well-characterized and have treatment technologies available if the alternative would enable DOE, the states, and EPA to meet

FFCA's October 1995 deadline. Conceptually, it may be easier and quicker for DOE to negotiate agreements on well-characterized streams because the states or EPA would already agree on the streams' hazardous and radioactive components and preferred treatment options. The organizations could then concentrate on negotiating the details of DOE's plans for defining the characteristics and technological options for the streams that are not as well characterized or for which there are no available treatment technologies. However, the Assistant Secretary believes that there is a good likelihood that DOE, the states, and EPA will meet FFCA's October 1995 deadline and has not instructed DOE's FFCA task force to test the merits of any specific alternatives for developing proposed and final site treatment plans.

Conclusions

Because DOE is months away from developing draft and proposed site treatment plans, it is too early to tell if DOE, the states, and EPA will be able to resolve technical and policy issues, negotiate final site treatment plans, and sign compliance orders by October 1995. However, considering the amount of work that remains and the time available to complete this work, if DOE either misses its milestones for preparing the draft and final site treatment plans or if the draft and final site treatment plans do not adequately resolve mixed waste treatment, characterization, and disposal issues, the likelihood of missing the October 1995 deadline increases.

Recommendation

To improve the likelihood that DOE, the states, and EPA will meet FFCA's October 1995 deadline, we recommend that the Secretary of Energy evaluate and implement, if appropriate, alternatives for meeting the deadline. These alternatives should include (1) preparing proposed and final site treatment plans for well-characterized waste streams and (2) beginning negotiations on these plans with the states and EPA before preparing proposed and final site treatment plans for streams that are not well-characterized.

Agency Comments

We discussed this report with DOE's Deputy Assistant Secretary for Waste Management, the director of DOE's FFCA task force, and staff of DOE's Office of the Assistant Secretary for Environmental Management. These officials agreed that the report accurately described the status of the Department's efforts to implement FFCA and the remaining actions that have to be completed by October 1995. They observed that there may be some drawbacks to preparing separate site treatment plans for streams that are

well-characterized and for streams that are less understood if the alternative includes negotiating separate compliance orders for well-characterized and less-understood streams. These potential drawbacks include the following: (1) The states and EPA may not be willing to enter into compliance orders for well-characterized streams that do not include schedules to better characterize streams that are less understood, and (2) developing multiple compliance orders for each mixed waste site increases the administrative burden of approving proposed language for compliance orders.

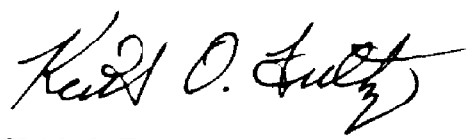
We believe that DOE needs to test acceptable alternatives to the current approach for developing proposed and final site treatment plans before February 1995 in case the Department misses its milestones for preparing the plans. By testing alternatives that states and EPA will consider, DOE can be better prepared to implement an alternative approach if it appears that the Department, the states, and EPA will not meet the October 1995 deadline.

As agreed with your office we did not obtain written comments from DOE on the report.

We performed our work from July 1993 through April 1994 in accordance with generally accepted government auditing standards. Appendix V provides detailed information on our scope and methodology.

We are sending copies of this report to the appropriate congressional committees; the Secretary of Energy; and the Director, Office of Management and Budget. We will make copies available to others upon request.

This work was performed under the direction of Victor S. Rezendes, Director, Energy and Science Issues, who may be reached at (202) 512-3841 if you or you staff have any questions. Major contributors to this report are listed in appendix VI.



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Contents

Letter 1

Appendix I DOE's Historical Efforts to Implement Resource Conservation and Recovery Act's Requirements for Mixed Wastes 18

Appendix II Key Milestones for Developing Plans and Compliance Orders Under the Federal Facility Compliance Act 19

Appendix III Organizations With Authority to Approve Mixed Waste Plans and Orders Mandated by the Federal Facility Compliance Act 20

Appendix IV Status of Large Mixed Waste Streams at DOE's Fernald, Idaho Falls, and Oak Ridge Sites 21

Appendix V Scope and Methodology 22

Appendix VI Major Contributors to This Report 24

Tables

Table 1: Issues That Are Central to National Discussions of Mixed Waste Plans and Compliance Orders 10

Table IV.1: Status of 34 Large DOE Mixed Waste Streams as of April 1994 21

Abbreviations

DOE	Department of Energy
EPA	Environmental Protection Agency
FFCA	Federal Facility Compliance Act
GAO	General Accounting Office
NGA	National Governors' Association
RCRA	Resource Conservation and Recovery Act
TSCA	Toxic Substances and Control Act

DOE's Historical Efforts to Implement Resource Conservation and Recovery Act's Requirements for Mixed Wastes

The Congress passed the Resource Conservation and Recovery Act (RCRA) in 1976 to minimize threats to public health and the environment associated with improper storage, treatment, and disposal of hazardous wastes. However, until 1987, the Department of Energy (DOE) took the position that its storage and disposal of hazardous and mixed wastes from nuclear weapons activities were exempt from RCRA and the Department followed its own standards for managing the wastes. Historically, DOE has stored and disposed of radioactive and mixed wastes at federally licensed commercial sites or in DOE-owned landfills, trenches, and above-ground vaults.

In May 1987, responding to an earlier federal court decision and to guidance issued by the Environmental Protection Agency (EPA) and Nuclear Regulatory Commission, DOE agreed that RCRA applied to the hazardous components of the Department's mixed wastes. As a result, DOE sites that treat, store, or dispose of hazardous and mixed wastes must (1) obtain permits under RCRA to operate waste treatment, storage, and disposal facilities; (2) meet RCRA's record-keeping and labeling requirements; and (3) comply with RCRA's 1984 land disposal restrictions. The restrictions preclude DOE from disposing of hazardous and mixed wastes unless the wastes can be pretreated to comply with EPA's standards or pretreated by an EPA-approved treatment technology. The restrictions also allow DOE to store untreated hazardous and mixed wastes only long enough to accumulate sufficient waste to operate treatment and disposal facilities.

DOE's transition from internal waste storage and disposal requirements to RCRA's requirements has been slow and difficult. In 1987, when DOE accepted RCRA's jurisdiction over the Department's mixed wastes, DOE did not know the quantities and hazardous characteristics of the mixed wastes stored at its sites, and had not developed treatment facilities that could meet RCRA's land disposal requirements. Since 1987, DOE has continued to store mixed wastes while it planned the construction of treatment facilities and developed treatment technologies—despite RCRA's 1984 restrictions that allow DOE to store only limited quantities of untreated mixed wastes.

Key Milestones for Developing Plans and Compliance Orders Under the Federal Facility Compliance Act

Key FFCA milestones	Legislated time frame
President signed FFCA.	Oct. 1992.
DOE submitted national inventory of mixed wastes, treatment capacities, and technologies.	Apr. 1993.
DOE sites submit proposed site treatment plans to host state or EPA.	No date specified.
Host state or EPA (1) requests public comments and (2) approves, approves with modifications, or disapproves DOE's proposed treatment plans for sites within the state.	Within 6 months of when DOE submits each proposed plan.
Host state or EPA issues compliance orders under FFCA for one or more sites within each state.	After the state or EPA approves sites' final treatment plans.
DOE loses sovereign immunity to fines for sites storing untreated mixed wastes.	Oct. 1995—unless a DOE site is complying with an approved final site treatment plan and compliance order.

Legend

FFCA = Federal Facility Compliance Act.

Organizations With Authority to Approve Mixed Waste Plans and Orders Mandated by the Federal Facility Compliance Act

States with approval authority	States for which EPA has approval authority
California	Hawaii
Colorado	Iowa
Connecticut	Maine
Florida	New Jersey
Idaho	Pennsylvania
Illinois	Virginia
Kentucky	
Missouri	
Nevada	
New Mexico	
New York	
Ohio	
South Carolina	
Tennessee	
Texas	
Washington	

Status of Large Mixed Waste Streams at DOE's Fernald, Idaho Falls, and Oak Ridge Sites

Table IV.1 presents the status of the 34 streams at the three DOE sites we reviewed. As of April 1994, DOE's Fernald, Ohio; Idaho Falls, Idaho; and Oak Ridge, Tennessee, sites had completed preliminary characterization and evaluation of each of the 34 waste streams. Preliminary evaluation refers to DOE's initial efforts to understand the type of wastes and how to treat the wastes—specifically, it includes DOE's efforts to identify the radioactive and hazardous material within a mixed waste stream and DOE's efforts to identify the technology that EPA has determined is the best available for treating the waste to meet RCRA's land disposal requirements.

Table IV.1: Status of 34 Large DOE Mixed Waste Streams as of April 1994

DOE site	Number of streams reviewed	Number of streams completing preliminary evaluation	Number of streams completing detailed evaluation	Number of streams being treated
Fernald	10	10	4	1
Idaho Falls	12	12	0	0
Oak Ridge	12	12	2	2
Total	34	34	6	3

The sites had also completed detailed evaluation of waste stream characteristics and technologies for 6 of the 34 streams and is treating 3 of the 6 streams. Detailed evaluation includes DOE's efforts to (1) refine its knowledge of mixed waste streams by either collecting additional information on how DOE generated the wastes or by analyzing waste samples, (2) evaluate alternative technologies, (3) demonstrate the more promising alternatives, and (4) select a specific treatment technology.

Scope and Methodology

To evaluate DOE's progress in submitting the treatment plans and entering into compliance orders under the Federal Facility Compliance Act (FFCA), we reviewed DOE's April 1993 national inventory of mixed waste streams and technologies, minutes of weekly meetings between DOE headquarters and field officials that discussed the status of the Department's efforts to prepare FFCA site treatment plans and proposed orders, and DOE planning documents that described the Department's methodology for preparing conceptual and draft site treatment plans. We also discussed DOE's process for developing the plans and proposed compliance orders and potential changes to this process with DOE headquarters and field officials.

To evaluate DOE's efforts to characterize, develop technologies for, and provide treatment capacity for mixed wastes, we interviewed DOE and contractor officials and documents pertaining to mixed wastes at DOE's Fernald, Idaho Falls, and Oak Ridge sites to (1) select the largest streams at each site; (2) determine the change in status between October 1991 and April 1994 of DOE's characterization, technology assessment, and treatment efforts for the individual streams that we had selected; and (3) identify the reasons why DOE had not made more progress with these streams. We selected DOE's Fernald, Idaho Falls, and Oak Ridge sites for our work because the Department's April 1993 interim mixed waste inventory indicated that the sites either stored or would generate large amounts of mixed wastes during the next 5 years. The mixed waste streams we selected included streams with different physical, chemical, and radioactive characteristics.

To determine the additional actions needed to meet FFCA's October 1995 deadline, we reviewed DOE's plans for developing and obtaining approval of site treatment plans and proposed compliance orders, identified technical and policy issues that could impede the states' and EPA's approval of the plans and orders, and attended DOE and National Governors' Association meetings that discussed DOE's and the states' views on these issues. We evaluated the importance of mixed waste technical and policy issues and the general likelihood that DOE, the states, and EPA would approve the plans and compliance orders by October 1995 by interviewing representatives of regulatory agencies or the governor's office in 13 states that have authority to approve plans and issue compliance orders and by interviewing EPA mixed waste specialists who will approve site treatment plans and issue compliance orders for 3 states that do not have this authority. We also contacted representatives of the National Association of Attorneys General and the attorney general's office in four states with large DOE mixed waste inventories to (1) evaluate

how these representatives are involved in DOE's process for complying with FFCA and (2) identify potential opportunities for more extensively involving states' attorneys general in the development of plans and orders under FFCA.

As agreed with the Senate Committee on Environment and Public Works and the House Committee on Energy and Commerce, we did not address items (C) and (D) of Section 3021(c)(2) of FFCA, which required us to evaluate the quality of DOE's site treatment plans and to identify any recurring problems with the Department's plans. We could not meet these requirement because, as discussed in the report, as of April 1994, DOE had not submitted any site treatment plans to the states or EPA. We performed our review from July 1993 through April 1994 in accordance with generally accepted government auditing standards.

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