

memorandum

DATE:

REPLY TO
ATTN OF: EM-33

SUBJECT: Announcements of FFCAct Results

TO: Policy Coordination Group and Public Participation Points-of-Contact

As of October 16, 1995, all but seven compliance orders were issued requiring the Department of Energy (DOE) to comply with the approved Site Treatment Plans (STPs). Rather than wait until these last orders are issued, EM management is currently discussing the most appropriate approach for public announcement of the STP process success story. Attached for your information and use, as appropriate, are the following documents:

- Attachment 1: At-A-Glance, a fact sheet that includes brief excerpts from the Response to Queries (RTQs), as well as other information that will also be used in the Overview currently being prepared by Headquarters for future dissemination; and
- Attachment 2: a Questions and Answers document (this is the RTQ document previously distributed, but now ready for public release).

Any subsequent information developed by Headquarters (e.g., press release) will be disseminated when available.

Copies of the Executive Summaries for all of the approved STPs with the exception of Idaho National Engineering Laboratory (INEL) and Lawrence Livermore National Laboratory (LLNL) have been forwarded to the DOE Reading Rooms, as well as the Public Participation Points-of-Contact. INEL and LLNL will be disseminated when available.

Please use all of the above information to "get out" the success story. If you have any questions, please call Marty Letourneau on (301) 903-7556.

Attachment



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Federal Facility Compliance Act
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**At a Glance:
Federal Facility Compliance Act
Approved Site Treatment Plans**

RESULTS

- The Department of Energy is announcing that regulators have approved Plans for treating mixed waste at 35 sites in 20 states as required by the Federal Facility Compliance Act.
- Taken together, the Plans call for 95 percent of DOE mixed waste to be treated at the site where currently stored or generated.
- The Plans represent a three-year, collaborative effort by DOE, the hazardous waste regulatory agencies of the states, the Environmental Protection Agency and stakeholders.

PURPOSE OF PLANS

- To bring DOE facilities into compliance with the land disposal restrictions of the Resource Conservation and Recovery Act (RCRA), the law that sets requirements for management of hazardous waste.
- To plan for developing treatment capacity and technologies for mixed waste managed (or expected to be managed over the next five years) at DOE sites.

WHAT IS MIXED WASTE?

- Contains both hazardous and radioactive components, each regulated under a separate law.
- Treatment must address requirements of both RCRA (hazardous constituents) and Atomic Energy Act (radioactive constituents).
- Classified as high-level, transuranic or low-level mixed waste, depending on nature of radioactive constituent.
- Each type requires different treatments to meet federal compliance requirements and protect the public, workers and the environment.

WHAT IS FFCAct?

- Amends RCRA, subjecting federal facilities to fines and penalties for noncompliance.
- Requires the Secretary of Energy to develop and submit Site Treatment Plans for all sites at which DOE manages mixed waste.

SUMMARY POINTS

- No shipments of high-level mixed waste for off-site treatment.
- Defense-related transuranic mixed waste disposal at Waste Isolation Pilot Plant, New Mexico, meeting WIPP Waste Acceptance Criteria.
- On-site treatment for between 75 and 95 percent of mixed low-level waste.
- Less than 2 percent (2,040 cubic meters) mixed low-level waste proposed for out-of-state treatment.
- Treatment locations not yet specified for about 23 percent of total mixed low-level waste inventory, but most of this is expected to be treated on site.
- Some treatment technologies still to be identified.

IMPLEMENTATION

- FFCAct requires regulatory agencies in each state to issue Orders requiring compliance with approved Plans.
 - Due to future funding and technical uncertainties, most Orders will set enforceable milestones for near term, high-priority activities, converting long-term schedules to milestones over time.
 - Most Orders state that DOE's future funding for environmental management will be considered in setting and revising Plans.
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DISPOSAL

- DOE recognizes the need to plan for disposal, though not required by FFCAct.
- Processes already established to study, design, construct and operate disposal facilities for high-level (Yucca Mountain, Nevada) and transuranic (Waste Isolation Pilot Plant, New Mexico) wastes, including mixed waste.
- Mixed low-level waste treatment residuals will be sent to available permitted commercial or DOE-operated disposal sites. If low-level disposal facilities are not available, off-site wastes will be returned to generator for storage.
- Evaluation of mixed low-level waste disposal facilities by DOE, state and federal-regulator working groups continues.
- Decisions will follow applicable state and federal regulations for siting and permitting and will include public involvement.

COSTS

- Estimated total life-cycle cost (including Hanford site): \$45.4 billion in 1996 dollars.
- About 84 percent of total cost for high-level mixed waste treatment, 5 percent for transuranic and 11 percent for low-level.
- Largest new costs result from 11 proposed major new treatment facilities.

FFCAct VS. OTHER INITIATIVES

- Plans are related to two other current DOE initiatives: the Waste Management Programmatic Environmental Impact Statement (WM PEIS) and the Baseline Environmental Management Report (BEMR).
- Approved Plans address only mixed waste treatment, while the WM PEIS addresses five different waste types and their treatment, storage and disposal.
- BEMR addresses all DOE Environmental Management programs and their life-cycle costs.

For more information contact:
Center for Environmental Management Information
1-800-736-3282 or <http://www.em.doe.gov/ffcabb>

TECHNOLOGY DEVELOPMENT

- DOE will continue to research new technologies and evaluate commercial options for treatment.
- Updated Plans may reflect use of new technologies that can treat waste more quickly and cheaply.

TRANSPORTATION

- Shipments will generally follow interstate road systems, with actual routes identified as shipping schedules are developed and Plans implemented at each site.
- DOE follows Department of Transportation regulations for shipping radioactive material.
- No transportation decisions made yet.
- States may identify preferred routes.

PUBLIC PARTICIPATION

- Two-tier public participation approach: national and site specific.
- DOE Headquarters provided opportunities to involve national-level stakeholders and worked continuously with National Governors Association and states.
- Sites used stakeholder comments in developing both Conceptual and Draft Site Treatment Plans.
- State or EPA regulators considered public comments on Proposed Site Treatment Plans in determining changes needed for final approvals.

FUTURE ACTIVITIES

- Implementation of requirements of each approved Plan.
- Preparation of site-specific environmental assessments and environmental impact statements as needed.
- DOE and states will continue to analyze potential management approaches for disposal of mixed waste.
- Continuing dialog with states, regulatory agencies and stakeholders.

**QUESTIONS AND ANSWERS ABOUT
THE FEDERAL FACILITY COMPLIANCE ACT OF 1992
AND THE DEPARTMENT OF ENERGY'S PLANS TO TREAT MIXED WASTE**

SUMMARY:

On April 6, 1995, the Department of Energy (DOE) submitted 37 plans to State and EPA regulators proposing treatment for mixed radioactive and hazardous waste stored and generated by DOE at 40 Sites in 20 States. As required by the Federal Facility Compliance Act of 1992 (FFCAct), the State and EPA regulators were provided a 6 month period to review the plans for approval, approval with modification, or disapproval. As of October 6, 1995, approved plans and implementing orders under the Resource Conservation and Recovery Act (RCRA) were expected from the State and EPA regulators for 35 sites in 20 states. Under the approved plans, more than 95 percent of the mixed waste would be treated at the site where it is currently stored or generated.

An overview of the approved Site Treatment Plans (STPs) and information about where to review site-specific plans will be available by October 31, 1995 from the Center for Environmental Management Information (1-800-736-3282) and selected DOE reading Rooms. Questions from the media can also be referred to Jayne Brady or Keith Holloway with the Office of Public Affairs on (202) 586-5806.

Listed below are questions about the FFCAct and the Plans prepared by the DOE for treating mixed waste in accordance with the Act, and responses prepared by the staff of the DOE Federal Facility Compliance Act Task Force. Questions concerning the questions or responses may be directed to Marty Letourneau on (301) 903-7656. The questions and responses have been organized according to the following themes:

1. Background/General Information
2. DOE's FFCAct Process
3. Relationship of FFCAct to Other DOE Activities
4. Approval/Specifics of Site Treatment Plans
5. Waste Volumes and Treatments
6. Transportation
7. Stakeholder/Public involvement
8. Funding/Budget Issues
9. Technology Development
10. Residuals Management/Disposal

1. BACKGROUND/GENERAL INFORMATION

1.1 What is mixed waste?

Mixed waste is waste that includes both radioactive and hazardous components. The FFCAct defines mixed waste as waste containing both hazardous waste subject to RCRA, and source, special nuclear, or by-product material subject to the Atomic Energy Act of 1954. As an example, a hazardous compound such as xylene could have been used as a cleaning solvent in a radioactive environment, and residual solvent could have become contaminated with nuclear materials, making it both hazardous and radioactive.

DOE operations related to energy research, production and storage of nuclear materials for defense programs, and other applications generate mixed waste. Mixed waste is also generated as DOE facilities are decontaminated and dismantled and as old burial and storage sites are cleaned up.

There are three types of mixed waste:

- High-level mixed wastes are primarily radioactive liquids generated through the reprocessing of spent nuclear fuel.
- Transuranic mixed wastes contain long-lived radionuclide particles that are heavier than uranium.
- All other mixed waste is considered mixed low-level waste.

Transuranic mixed waste and mixed low-level wastes may be generated in many forms, including liquids, debris, and soils.

1.2 What is the Federal Facility Compliance Act?

The FFCAct of 1992 makes federal facilities subject to potential fines and penalties for violations of the Resource Conservation and Recovery Act, the law that sets requirements for the management of hazardous waste. Prior to its passage, federal facilities were required to comply with the RCRA regulations, but had sovereign immunity from fines and penalties for certain violations.

When Congress passed the FFCAct, it allowed a three-year delay, until October 6, 1995, before fines or penalties could be imposed upon the Department for certain violations related to storage of mixed waste. Mixed waste stored at DOE sites was generally not in compliance with RCRA mixed waste land-disposal restrictions because of a lack of treatment capacity.

During the three-year delay, the Department was required by the FFCAct to 1) prepare and submit a national inventory report identifying its mixed waste volume, characteristics, treatment capacity and available technologies; and (2) prepare and submit (to the appropriate State or EPA regulators) Site Treatment Plans for developing the needed treatment capacity and treating the mixed waste for each site at which the Department generates or stores mixed waste.

1.3 Where can we get copies of Approved Site Treatment Plans?

Copies of the Approved Site Treatment Plans will be available for review at the DOE reading room for each Site that prepared a plan. Copies of all of the approved plans will also be available for review at the DOE Headquarters reading room, the DOE Center for Environmental Management Information, and several reading rooms across the DOE complex. It is not expected, however, that all of the plans will be available before the end of October, 1995. Information concerning the location of the reading rooms and availability of the plans can be received from the Center for Environmental Management Information (1-800-736-3282).

2. DOE'S FFCAct PROCESS

2.1 How were the Site Treatment Plans developed?

After consultation with State and Federal regulators, the Department issued a Federal Register Notice on April 6, 1993, announcing a plan to submit the STPs in three stages:

- Conceptual Site Treatment Plans were submitted in October 1993, and described a wide range of treatment alternatives for each mixed waste at each site;
- Draft Site Treatment Plans, submitted and announced in the Federal Register on August 31, 1994, incorporated input from the state/federal regulators and narrowed the list of options to one or two options for each mixed waste stream in inventory at each site;
- Proposed Site Treatment Plans were submitted after further analysis and discussions with state/federal regulators and input from stakeholders, stating DOE's proposed treatment location for each mixed waste stream at each site.

The FFCAct requires that the appropriate State and EPA regulators review the Proposed Site Treatment Plans, consider regional treatment facility needs, consult with other affected states, consider public comments, and approve, approve with modification, or disapprove each plan. After each STP is approved, the authorized regulatory agency will then issue an order requiring compliance with the approved plan. Sites are not subject to fines and penalties related to the management of the mixed waste as long as they continue to comply with their plan and order.

2.2 Who did DOE coordinate with in developing the Site Treatment Plans?

DOE followed a three-phased approach for developing the Site Treatment Plans. The National Governor's Association, through a cooperative agreement with the Department of Energy, has coordinated representative from 20 States and the U. S. Environmental Protection agency to assist DOE in evaluating the candidate treatment options and developing the treatment plans. DOE, through each site, also worked with the public, tribal governments, and local officials. Each DOE site provided information and materials concerning the development of the Site Treatment Plans, made the plans available for public review, and held meetings or provided other opportunities for public comment on the plans and treatment options.

2.3 What principles guided development of the STPs?

The Department of Energy and the State/EPA regulators agreed to the following principles for developing potential treatment options for the Site Treatment Plans:

- Maximize the use of existing facilities, mobile treatment units, and transportable temporary treatment units to minimize new construction;
- Maximize the treatment of wastes at the sites where wastes are currently stored or generated to minimize transportation impacts; and
- Establish treatment schedules agreeable to the Department and the state/EPA regulators that can be met, given expected funding.

2.4 Why has the number of Plans DOE was preparing decreased from when this process began 3 years ago?

When DOE began its effort to comply with the Federal Facility Compliance Act, the first requirement was to prepare an inventory of all known DOE mixed waste. In April, 1993 when this inventory was submitted, over 40 sites were identified that were potentially storing or generating mixed waste. As DOE's FFCAct process continued, it was found that some of these sites were not generating mixed waste, or were otherwise already in compliance with the requirements of the FFCAct. In addition, some sites which had very small volumes of mixed waste have since come into compliance with the FFCAct, and therefore, a Plan is no longer required for these sites. As shown below, DOE submitted 37 Proposed Site Treatment Plans (addressing 40 sites) in April 1995 for approval by the State and EPA regulators. Of these, 35 Plans (addressing 38 sites) still require approval and are expected to be approved by the regulators.

3. RELATIONSHIP OF FFCAct TO OTHER DOE ACTIVITIES

3.1 What is the relationship of the Waste Management Programmatic Environmental Impact Statement to the Site Treatment Plans?

Both the Waste Management Programmatic Environmental Impact Statement (WM PEIS) and the Site Treatment Plans will affect future decisions for managing mixed waste at DOE Sites.

The Department is preparing the WM PEIS under the National Environmental Policy Act to evaluate the potential environmental impacts of a wide range of alternatives for treatment, storage, and disposal of five different types of DOE wastes nationwide (including mixed waste). Specifically, the WM PEIS is evaluating the complex-wide impacts and implications of programmatic decisions regarding the treatment, storage, and disposal of high level, transuranic, mixed low-level, low-level, and hazardous wastes. These analyses will provide a basis for understanding the complex-wide ramifications of final program decisions. The STPs, on the other hand, focus only on treatment options for mixed waste at specific sites where mixed waste is generated or stored.

In the Draft WM PEIS that was issued for public comment in September 1995, DOE's preferred alternatives for treatment of high-level, transuranic, and low-level mixed waste reflect options contained in the STPs. These options include on-site treatment for high-level waste, treatment to meet the WIPP waste acceptance criteria followed by disposal in WIPP for transuranic mixed waste, and a regional treatment option for low-level mixed waste that closely approximates the STPs.

3.2 What is the relationship between FFCAct and the Baseline Environmental Management Report (BEMR)?

The Department prepared the first Baseline Environmental Management Report in 1995 in response to a Congressional requirement to provide estimated life-cycle costs for all DOE Environmental Management activities. To be issued annually, the Report reflects the activities that DOE field offices expect to carry out and alternative cases developed by the Department showing the potential cost variations from four key factors: future land use, scheduling, technology development, and the waste management configuration.

The mixed waste management activities identified in the STPs represent only a fraction of the activities considered in the BEMR, which also addresses environmental restoration, stabilization of nuclear materials and facilities, waste management not subject to the FFCAct, technology development, and support functions.

4. APPROVAL/SPECIFICS OF SITE TREATMENT PLANS

4.1 Did all sites that were preparing an STP get approval for their plans?

All sites that submitted Proposed Site Treatment Plans to their regulators and who still require approved plans are expected to receive approval. It is not expected that any State or EPA regulators will disapprove any of the plans. However, all plans may not be approved on October 6, 1995. In some cases regulators felt that additional time was needed to ensure that certain issues had been addressed before the plans were finalized.

4.2 How many Proposed STPs were modified before final approval?

All Site Treatment Plans were modified before final approval. In some cases edits were made to reflect regulators concerns about administrative language, in other cases schedules or milestone dates may have been adjusted to reflect new information. In only a very few cases were changes made that resulted in new alternatives or treatment facilities being identified that had not been reflected in the Proposed Plans.

4.3 Some STPs were not approved on October 6. Does this mean these sites are out of compliance?

The status of DOE's compliance does not change on October 6, 1995 if a plan is not approved. Additionally, the status of DOE's compliance with the FFCAct is not affected by whether the implementing order issued with the plan is a consent order or a unilateral order. However, as of October 6, 1995 if the plan is not approved, the regulator has the ability to assess fines and penalties against DOE for violations of the RCRA prohibition against storage of untreated mixed wastes.

While 35 plans were expected to be approved on October 6, 1995, some will be late. In some cases regulators felt that additional time was needed to ensure that certain issues had been addressed before the plans were finalized. Because the approval of these plans and issuance of the implementing orders is the culmination of an intensive three-year collaborative process between DOE and its regulators, some regulators have decided to make sure they are satisfied with the Plans, and will require additional time. The 7 sites where plans are not expected to be approved on October 6, 1995 include: Lawrence Livermore National Laboratory (CA), Ames Laboratory (IA), The Idaho National Engineering Laboratory (ID), Argonne Laboratory-East (IL), Brookhaven National Laboratory (NY), the Nevada Test Site (NV), and the West Valley Demonstration Project (NY).

The State and EPA regulators for each site that is not expected to have an approved plan on October 6, 1995, have also agreed to apply their discretion concerning enforcement action and to not issue fines or penalties against DOE, assuming that progress continues toward final approval of the Plans shortly.

4.4 Now that the STPs are approved and orders are issued, can they ever be changed?

The FFCAct provides for annual updates of Site Treatment Plans. Additionally each Plan includes administrative language that establishes how changes can be made to the plans. The Department is committed to working with State and EPA regulators on these updates to address new opportunities that may arise that could treat wastes more quickly and cheaply. For instance, as opportunities arise from increased commercial options or as new and emerging technologies for treating mixed waste become available, DOE will work with the regulators to determine whether changes are warranted.

4.5 Will STPs always be required?

Once a site achieves and is able to maintain compliance with the storage prohibition in section 3004(j) of RCRA, an STP and compliance order would no longer be required. The appropriate State and EPA regulator for each site would help make that determination.

5. WASTE VOLUMES AND TREATMENTS

5.1 Why does mixed waste require special treatment?

Mixed waste does not require special treatment, but because it is composed of two separate waste types that are regulated under separate laws (the Resource Conservation and Recovery Act and the Atomic Energy Act), treatment must address the requirements of both. To meet RCRA requirements, mixed waste must be treated in accordance with requirements of the RCRA land disposal restrictions which establishes acceptable types of treatments and concentrations of hazardous constituents remaining in the waste that must be achieved before the waste can be either stored or disposed. To meet AEA requirements, radioactive components of the waste must be managed in a manner that is protective of workers and the environment and does result in unacceptable radiation doses to workers, the public, or the environment.

The three types of mixed waste (high-level, mixed transuranic, and mixed low-level) require different treatments in order to meet federal compliance requirements and to protect the public, workers, and the environment.

High-level waste is planned to be treated at the sites where the waste is currently stored, in facilities that the Department has previously studied and planned which will vitrify the waste into a solid glass waste form, followed by disposal at a geologic repository, currently planned for Yucca Mountain, Nevada.

Mixed transuranic waste is planned to be treated for acceptance at the Department's transuranic disposal facility, the Waste Isolation Pilot Plant in Carlsbad, New Mexico.

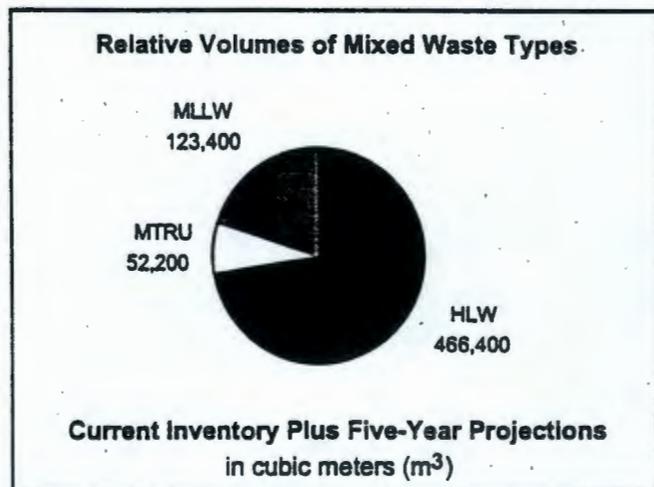
Mixed low-level waste is planned to be treated primarily at the facilities where it is currently stored or generated in accordance with the facilities designated in the site-specific treatment plans prepared by the Department under the Federal Facility Compliance Act.

5.2 How much DOE mixed waste is there and where is it?

The locations where DOE mixed waste is managed include DOE sites, federal laboratories, private firms, universities, and naval shipyards. A few sites manage millions of gallons of liquid high-level waste, while most manage very small quantities of a variety of different types of mixed low-level waste.

The total volume of mixed waste (642,000 cubic meters) includes current mixed waste inventories and waste projected to be generated within the next five years. Of that total, approximately:

- 73 percent (466,400 cubic meters) is high-level mixed waste, and is stored at 4 sites: Hanford (WA), the Savannah River Site (SC), the Idaho National Engineering Laboratory (ID), and the West Valley Demonstration Project (NY);
- 8 percent (52,200 cubic meters) is mixed transuranic waste, and is stored primarily at 4 sites: the Idaho National Engineering Laboratory (ID), the Savannah River Site (SC), Los Alamos National Laboratory (NM), and Oak Ridge (TN); and
- 19 percent (123,400 cubic meters) is mixed low-level waste, with 90 percent of this waste being stored at six sites: Hanford (WA), Savannah River (SC), Oak Ridge (TN), Rocky Flats (CO), the Idaho National Engineering Laboratory (ID), and the Portsmouth Gaseous Diffusion Plant (OH).



Future generated mixed wastes, which may include waste generated through environmental restoration and decontamination and decommissioning activities, will require treatment and may be added to the STPs based on discussions with the regulators.

5.3 What sites have the most mixed waste? How much of what they have will be treated on site?

Including high level and mixed transuranic waste, Hanford has 50 percent of DOE's total mixed waste, followed by Savannah River Site, with 25 percent. Hanford will treat 100 percent of its mixed waste on site; Savannah River will treat 97 percent of its mixed waste on site.

Excluding high level and mixed transuranic, 6 sites account for 90 percent of DOE's mixed low-level waste. These sites are: Hanford (WA), Savannah River (SC), Oak Ridge (TN), Rocky Flats (CO), the Idaho National Engineering Laboratory (ID), and the Portsmouth Gaseous Diffusion Plant(OH). For these sites, in total, at least 68 percent and as much as 87 percent of the mixed low-level waste is expected to be treated on site.

5.4 What percentage of the mixed waste will be treated at commercial facilities?

Of the total amount of all mixed waste, commercial facilities are proposed to treat approximately 18 percent. In some cases, treatment will occur off site at vendor facilities. In other cases, vendor equipment may be moved to or constructed on DOE sites. In addition, the Department has developed a request for proposals to be released to industry for development of new treatment technologies.

5.5 Who will provide the oversight for commercial facilities?

Commercial treatment facilities are required to be permitted by the same regulators who regulate DOE facilities, State or EPA regulators. Such commercial treatment facilities would be permitted by the regulators under RCRA, and would be subject to the enforcement and oversight activities conducted by the regulator under RCRA.

5.6 What treatment technologies will be used to treat mixed waste?

The exact treatment technology that will be used to treat mixed waste has not yet been selected or identified at all sites. The Resource Conservation and Recovery Act establishes the general type of treatment that must be applied to the hazardous components (e.g., destruction of organics) and the concentration levels of hazardous constituents that must be achieved in the treated waste. Depending on the type of mixed waste, a variety of treatment types is possible, including:

- Waste water treatment (neutralization, filtration, evaporation)
- Stabilization (solidifying waste)
- Organic destruction (destroying organics through use of high heat or through non-thermal processes such as chemical oxidation)

- Effecting chemical changes (such as changing the pH of waste, using a precipitation process to remove one component of the waste)
- Other physical processes (encapsulation or separation).

5.7 How much of the mixed waste will be incinerated? How many incinerators is DOE planning to construct?

Incineration is listed as the Best Demonstrable Available Technology for waste containing many organic hazardous constituents under the RCRA requirements. However, other thermal and chemical oxidation technologies may be able to be used to treat much of this waste, if such methods can achieve similar hazardous constituent destruction and reduction efficiencies as incineration. Currently, the Department has 3 existing incinerators that it plans to use to treat mixed waste: The Waste Experimental Reduction Facility at the Idaho National Engineering Laboratory (ID), the Consolidated Incineration Facility at the Savannah River Site (SC), and the Toxic Substance Control Act permitted incinerator at the Oak Ridge Reservation (TN). Approximately 8,000 cubic meters of mixed low-level waste (6 percent of DOE mixed low-level waste) is expected to be treated at these facilities.

The Department is not planning to construct any new incineration facilities. However, the Department is planning to design and construct several new thermal or organic destruction facilities at. Treatment technologies have not yet been selected for these facilities, and alternatives to incineration are being actively pursued.

5.8 When will treatment begin? How long will it take to treat all the mixed waste?

For existing treatment facilities, the Site Treatment Plans specify schedules for shipping waste and beginning treatment which have been coordinated to ensure that the amounts and type of waste received at a treatment facility are consistent with its capacity and capabilities. Treatment of mixed waste at these facilities can begin as soon as the regulators have approved of these plans and the waste is prepared for treatment. For example, mixed waste treatment has already begun at the Waste Experimental Reduction Facility at the Idaho National Engineering Laboratory (INEL). For new facilities, which require siting, design, construction, and permitting, waste generally will not be received for treatment until the facilities are operational. Excluding the Waste Immobilization Facility at INEL, which is not scheduled to finish treating high-level mixed waste until 2088, treatment in the 11 large facilities is expected to be completed by 2035. Treatment schedules for the 11 new facilities are shown below.

Site Treatment Plan Schedules

Current STP Schedules for New Treatment Options of at least \$50 Million Estimated Life-Cycle Cost (Excluding TWRS)

TREATMENT SYSTEM	FISCAL YEAR											
	1995	2005	2015	2025	2035	2045	2055	2065	2075	2085	2095	
Idaho Waste Immobilization Facility (HLW)						█	█	█	█	█	█	█
Idaho MLLW Processing Facility			█	█	█							
Idaho TRU Characterization Facility	█	█	█									
Argonne West Remote Treatment Facility			█	█	█							
Lawrence Livermore MW Management Facility (MLLW)	█											
Oak Ridge TRU Processing Facility	█	█	█									
Oak Ridge Commercial Treatment (MLLW)	█	█	█									
Rocky Flats System 3 (MLLW)	█	█	█									
Rocky Flats System 5 (MLLW)	█	█	█									
Rocky Flats System 2/4B (MLLW)	█	█	█									
Savannah River TRU Facility		█	█	█	█							

5.9 How much will it cost to treat all the existing mixed waste?

The estimated total life-cycle cost (including the Hanford site) for treatment of mixed waste is \$45.4 billion in 1996 dollars. Life cycle cost accounts for construction and operation of the facilities, annual operating costs over the life of the facility, and closure. The largest new costs result from 11 proposed major new treatment facilities. About 84 percent (\$38.1 billion) of the total cost is for high-level waste treatment. Mixed transuranic accounts for 5 percent (\$2.3 billion) and mixed low-level waste accounts 11 percent (\$5 billion) of the total.

5.10 What sites will have major new facilities to treat mixed waste?

For HLW:

INEL

For MLLW:

INEL
Rocky Flats
Lawrence Livermore
Oak Ridge

For MTRU:

Oak Ridge
Savannah River
INEL
Argonne-West (includes MLLW)

6. TRANSPORTATION

6.1 How much mixed waste will be moving from state to state for treatment?

Of the total 123,400 cubic meters of mixed low-level waste being addressed in the Site Treatment Plans, 92,800 cubic meters (more than 75 percent) will be treated at the site where it is currently stored or generated. Although most sites plan on shipping some mixed waste to other out-of-state DOE sites for treatment, the relative quantity involved is quite small. Only 2,040 cubic meters of mixed low-level waste (1.7 percent) has been identified in the plans for treatment out of the State where it is currently stored or generated. The remaining 28,560 cubic meters (23 percent) have not yet had a treatment location identified, however, much of this waste is expected to be treated on site where it is currently stored. Approximately 23,200 cubic meters (81 percent) of the mixed low-level waste for which a treatment location is not yet been identified is currently stored at the Oak Ridge Reservation, and is being analyzed for potential privatized treatment. It is expected that this privatization approach would result in construction of a privately operated new facility at the Oak Ridge site and treatment of this waste at the Oak Ridge Reservation, thus raising the total amount of mixed low-level waste treated on site to 94 percent.

None of DOE's high-level mixed waste will be shipped off site for treatment. This waste will only be transported for disposal, and that will be in a stable, solid waste form. The Department plans to dispose of all its defense-related transuranic mixed waste at the Waste Isolation Pilot Plant in New Mexico.

6.2 Where is the mixed waste that is being transported out-of-state for treatment going?

Two DOE sites are currently planned to receive 83 percent of the 2,040 cubic meters of mixed low-level waste that has been identified for treatment off the site where it is currently stored or generated. The Idaho National Engineering Laboratory is expected to treat approximately 470 cubic meters (23 percent), and Oak Ridge is expected to treat approximately 1,220 cubic meters (60 percent) of off-site waste. The remaining 350 cubic meters are identified to go to various other DOE and commercial treatment locations. Out-of-state MLLW shipments are shown below.

Mixed Low-Level Waste Treatment by State
Waste Volumes in Cubic Meters—Current Inventory Plus 5-Year Projections

STATE	DOE WASTE TREATED IN STATE		STATES RECEIVING WASTE FROM OUT-OF-STATE DOE SITES									TOTAL
	In Existing Systems	In New Systems	FL	ID	NM	SC	TN	TX	UT	WA	TREATMENT LOCATION NOT SPECIFIED	
California	1,981.9	82.9		212.7			1.0				29.6	2,308.0
Colorado	1,887.9	15,428.6		157.2			89.9					17,563.5
Connecticut				5.3		3.6				4.3		13.1
Hawaii				0.1			16.0			4.5		20.6
Iowa							0.2			0.0		0.2
Idaho	1,239.9	25,784.6					9.4					27,033.9
Illinois	15.5	124.2					3.1					142.7
Kentucky	8.4	85.7					320.5				617.6	1,032.2
Maine						0.0				2.3		2.4
Missouri	1,960.5			1.8			61.5					2,023.8
New Mexico	286.4	385.6					22.6				430.8	1,125.4
Nevada	285.7	652.0	0.3				1.8				2.2	942.0
New York	2.9	13.2		31.0		8.7	18.5	1.7	5.7	8.9	122.5	213.1
Ohio	1,079.5	7,134.3		10.5			87.3		8.8	13.3	3711.9	12,856.1
Pennsylvania				13.8		2.0						15.8
South Carolina	9,290.4	3,193.1		7.9	0.8						391.6	12,883.8
Tennessee	2,749.6	9,198.0									23,254.2	35,201.9
Texas	266.6	779.4										1,046.0
Virginia				9.8		2.1						11.8
Washington		8,955.8		19.0			36.0				8.0	9,018.7
STATE TOTALS	21,055.2	71,817.4	0.3	469.1	0.8	16.4	1,477.6	1.7	14.5	33.3	28,568.4	123,454.9

Note: Volume totals may not equal the sum of state-to-state due to rounding.

*Waste Volume <0.05m³

6.3 What are the transportation routes for these shipments? Will they be rail or truck shipments?

Shipments of mixed waste will generally follow interstate road systems. Actual routes will be identified as shipping schedules are developed and the plans are implemented at each site. States may identify preferred routes within their boundaries to avoid heavily populated areas. All shipments of mixed waste will follow Department of Transportation regulations. Some potential transportation routes and the relative impacts of rail versus truck transportation are discussed in the WM PEIS which is currently available for public review and comment.

7. STAKEHOLDER/PUBLIC INVOLVEMENT

7.1 How has the public been involved in development of the Site Treatment Plans?

In developing the Conceptual and Draft Site Treatment Plans, the Department implemented public involvement on both site-specific and national levels. Site-specific activities varied by site, but included notifying stakeholders of the availability of plans, informing local interested parties, holding meetings with the public, and soliciting comments on the plans. DOE Headquarters provided opportunities to involve national-level stakeholders and worked continuously with the National Governors' Association and the individual states.

The Federal Facility Compliance Act also required that when DOE submitted its proposed plans in April of 1995, that State and Federal regulators were required to make the proposed plans available to the public and consider public comment in determining whether the plans should be approved, approved with modification, or disapproved. Additional public involvement opportunities were also held at many of the DOE sites in conjunction with the State and EPA regulators.

7.2 How were stakeholder comments factored into the final plans?

Comments from stakeholders and the public on the Conceptual Site Treatment Plans were used by each site in developing their Draft Site Treatment Plans. Likewise, Sites used comments and input from the stakeholders and public at their sites in developing their Proposed Site Treatment Plans. Comments on the Proposed Site Treatment Plans were used by the State or EPA regulator with jurisdiction over each site's plan in determining what changes, if any, needed to be made in order to approve the plans.

8. FUNDING/BUDGET ISSUES

8.1 Will there be adequate funding to implement the STPs? How will DOE comply with the Plans and Orders if funding is reduced in the future?

The commitments in the Plans can be met under current budget assumptions. DOE believes the Plans can be implemented based on funding requested in the President's Budget submission for Fiscal Year 1996 and funding targets for Fiscal Year 1997 and beyond.

However, in negotiating the Orders, DOE recognized that future funding levels were very uncertain and can reasonably be expected to decrease. DOE asked the States and EPA to establish a process in the Orders that would enable the Plans to reflect future funding allocations and budget activities over time. Most regulators agreed, and the Orders state that DOE's funding for environmental management will be considered in setting and revising the Plans.

Most Orders also will use a process of setting enforceable milestones for the near term, converting long-term schedules to milestones over time. Informally called "rolling milestones," this process should allow DOE and the regulators to cope with both funding and technical uncertainties as the Plans are implemented.

8.2 What are "rolling milestones" and how will DOE use them?

Rolling milestones is the informal description of a process developed by DOE and its regulators for use in its compliance orders which helps cope with both funding and technical uncertainties.

In negotiating Orders, DOE recognized that future funding levels were very uncertain and can reasonably be expected to decrease. DOE asked the States and EPA to establish a process in the Orders that would enable the Plans to reflect future funding allocations and budget activities over time. Most regulators agreed, and the Orders state that DOE's funding for environmental management will be considered in setting and revising the milestones and deliverables in the Plans on a periodic basis.

9. TECHNOLOGY DEVELOPMENT

9.1 How will the STPs and compliance orders take into account emerging treatment technologies?

The Department will continue research on both existing and emerging technologies that show promise in treating mixed waste. The Department will also continue to evaluate commercial treatment technologies as a means of supplying both on-site and off-site capacity for some mixed wastes. These advancements will be analyzed as STPs are updated. If new or emerging technologies become available that DOE and its regulators agree are preferable, and which can treat waste more quickly and cheaply than the approach outlined in a specific site's plan, then such new approaches could be reflected in the updates to the plans.

10. RESIDUALS MANAGEMENT/DISPOSAL

10.1 What happens to the mixed low-level waste after it is treated?

Residuals from the treatment of mixed low-level waste will be sent to available permitted commercial or DOE operated disposal sites. If disposal facilities are not available, off-site wastes will either be returned to the generator for storage or remain at the treatment site until disposal facilities can accept the waste. How the residual wastes will be managed prior to disposal has been worked on a case-by-case basis with each state and is described in specific STPs.

10.2 What percentage of the total amount of mixed waste is destined for disposal at WIPP?

All mixed transuranic waste is destined for disposal at WIPP. This comprises 8 percent (52,189 cubic meters) of the total mixed waste inventory.

10.3 Where will the rest of the mixed waste be disposed of?

Although the FFCAct does not require the development of disposal plans, the Department recognizes the need to address this final phase of mixed waste management. To that end, the Department and the states have established separate working groups to address disposal for low-level mixed waste. Potential sites for mixed low-level waste disposal have been identified for evaluation. The ultimate decision to use any of these sites will be made following applicable state and federal regulations for siting and permitting and will include appropriate public involvement.

High-level mixed waste is destined for disposal at a geologic repository, currently planned for Yucca Mountain, Nevada.

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